

# SIESTA

## Spatial Indicators for a ‘Europe 2020 Strategy’ Territorial Analysis

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# 1. Introduction

The European Commission (EC) launched the Europe 2020 Strategy (EU2020S) at the end of 2009, consolidated as a Communication from the EC in March 2010<sup>1</sup> and finally adopted in June 2010. The EU2020S fundamentally constitutes a growth plan for the decade 2010-2020 that aims for EU recovery from the current ongoing crisis.

Structurally, the EU2020S consists of three mutually reinforcing **priorities**: smart growth, sustainable growth and inclusive growth. Derived from these three pillars for growth, seven particular **flagship initiatives** are proposed, each one including specific actions: three devoted to smart growth (for digital society, innovation and youth) and two for each one of the other priorities, these being resource efficiency and the manufacturing sector for sustainable growth, and new skills and labour market and the fight against poverty for inclusive growth. Apart from these priorities and flagship initiatives, the EU2020S contains a list of numerical goals (so-called **headline targets**) that sets specific figures for measuring its purposes.

Considering this policy context and the close link of this Strategy to territorial cohesion the **basic aim of this project** was to illustrate the territorial dimension of the EU2020S, that is, to show how the EU2020S acts territorially, particularly at the regional scale. This aim is reached through the elaboration of an Atlas that is the main output of the project. The maps included in the Atlas are based on a set of territorial indicators at the appropriate geographical scale and reflect (when possible) both the present state and recent trends in the opportunities and challenges of the European regions with regards to the objectives set in the Europe 2020 Strategy. The indicators have been derived from the EU2020S documentation, thus indirectly informing about the current economical and financial crisis

In brief, the basic **aim** of the SIESTA Project was to show how the EU2020S acts territorially, particularly on a regional scale.<sup>2</sup> This is consistent with one of the expectations of the EU2020S itself, which includes a clear statement expressing that “the benefits of economic growth spread to all parts of the Union, including its outermost regions, thus strengthening territorial cohesion” (p. 16). This point clearly links the

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1 Europe 2020. A Strategy for Smart, Sustainable and Inclusive Growth – COM(2010) 2020.

2 The regional scale is referred to NUTS 2 level and, when possible, NUTS3. Cities, metropolitan areas and other equivalent geographical objects for urban realities will be considered as well, but only when the appropriate data at this scale exists. In this Inception Report considerations about the territorial scales of research are raised (see section 3 in this respect).

EU Official Strategy for responding to the crisis with the broad territorial cohesion principle, which is a constitutive piece of the EU institutional arrangements (according to the Treaty of Lisbon signed in 2007 and coming into effect in 2009) and one of the 'milestone' concepts in territorial analysis in Europe, including ESPON.

The general aim of the SIESTA Project has been concreted in an **Atlas** that shows the current territorial state and the recent trends of the EU regions (when available data allowed this). The Atlas is focused on the conditions of the EU regions to overcome the current crisis, that is, the EU2020S.

Derived from the main aim of the Project (i.e. the development of a EU2020S Atlas), three major objectives were established:

- To assess how EU2020S documentation can be territorially understood and expressed (→ *Selection of indicators and elaboration of maps*)
- To analyse what the territorial mosaic resulting from considering the EU2020S means on a regional scale. (→ Determination of how the studied regions are positioned in relation to the EU2020S framework and elaboration of the Atlas).
- To contribute with guidance for policy directions and means of implementation of the EU2020S. (→ *Proposition of orientations for policy makers that have been integrated in both (i) the Atlas itself and (ii) and an extensive document annexed in Section 8 of the present document*).

These three major targets are the pillars that support the methodological approach of the project. The following pages explain in detail the methodology and workflow developed by SIESTA team in order to develop an Atlas that will allow users to identify (i) the opportunities of each region with regard to exploiting their territorial potentials in support of smart, sustainable and inclusive territories in Europe, and (ii) which types of regions can be perceived as key drivers for European development and growth at various scales.

## **2. Conceptual and Methodological Framework**

In this section, the methodology devoted to achieve the targets mentioned above is explained in detail. As the main output of the SIESTA project is an Atlas (both in hardcopy and electronic version) the bulk of

the methodology is related to the elaboration of a EU2020S Atlas and therefore, to also thoroughly develop a set of maps that allow us to illustrate the regional dimension of the EU2020 Strategy. In general terms, this methodology consists of a workflow - a sequence of connected steps - that has been coordinated by SIESTA Leader Partner (University of Santiago de Compostela) and in which six partners have participated. Obviously, going through the workflow steps several methods have been used -especially to develop indicators- and they are explained in detail through the sections of this report.

## **2.1. Project Keywords**

### **2.1.1. General Concepts**

- Global financial and economic crisis.
- Growth.
- Regional policy.
- Territorial cohesion.

### **2.1.2. Smart Growth**

- Research and development.
- Innovation.
- Early school drop-out.
- Tertiary education attainment.
- Youth.
- Digital society.
- Internet.

### **2.1.3. Sustainable Growth**

- Competitiveness.
- Climate change.
- Manufacturing sector.
- Green economy.
- Energy efficiency.
- Renewable energy.
- Protection and conservation of biodiversity.

- Mobility.

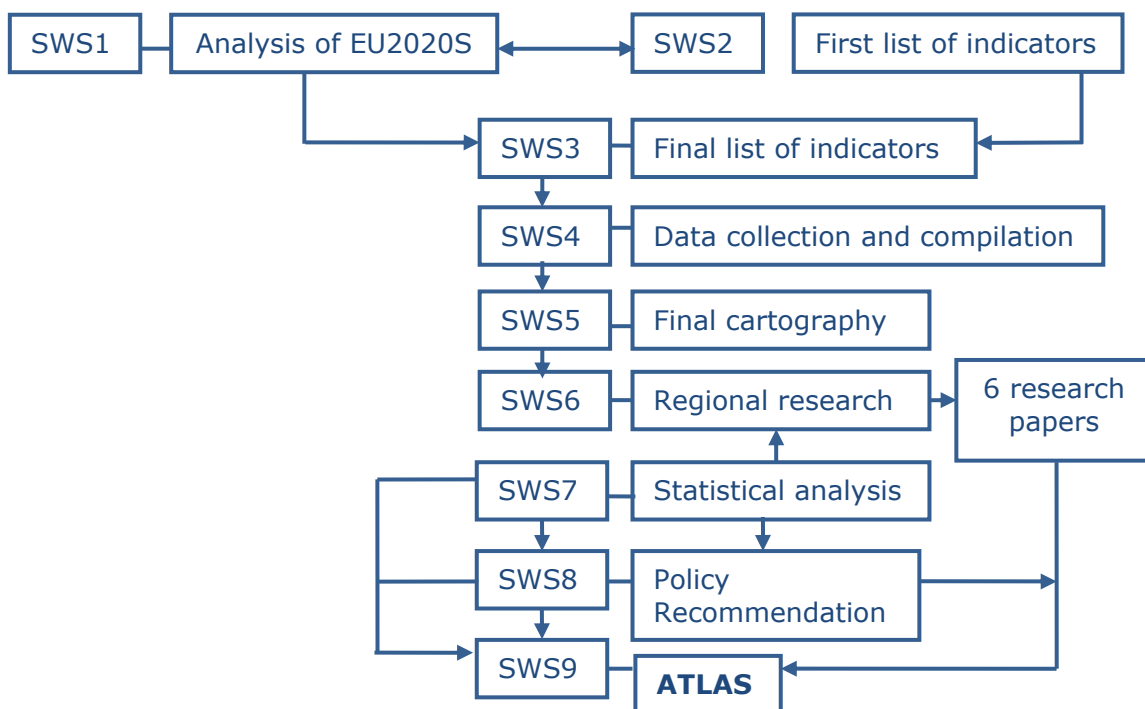
#### 2.1.4. Inclusive Growth

- Employment and unemployment.
- Poverty.
- Gender imbalances.
- Life-long learning and skills development.
- Social exclusion.
- Ageing.

## 2.2. Overall Methodology and Workflow

As was explained above, the overall methodology of this project can be understood as several consecutive work steps in which a number of secondary methods were used (Figure 1). These nine scientific work steps (SWSs herein) are in accordance with the general aim and the three major secondary objectives outlined above. Figure 1 shows the workflow scheme and the relationships between the nine SWSs.

**Figure 1 Main Work Steps and Derived Outputs**





The nine work steps, explained in detail in sections 3 to 9, were the following:

- **SWS1: Analysis of the EU2020S documentation and its related documents.** The SIESTA project is devoted to considering the territorial dimension of the European 2020 Strategy (EU2020S). Obviously, the first scientific task to be carried out in this respect is to scrutinise the EU2020 itself (see section 3). However, it has to be said that the document of the EU2020S establishes a dense network of connections with other directly related documents and in this respect the task embraces the wide range of documents directly linked to the EU2020S. In other words, understanding the EU2020S goes beyond strictly the document of the EU2020S. The basic objective of this SWS1 was to provide an operational understanding of the EU2020S in order to determine its territorial dimension, which additionally will contribute to the elaboration of the list of indicators to be used in the following research steps of the Project. Results envisaged under this SWS1 are shown in section 3 of this document.
- **SWS2: Selection of a first list of indicators that could be potentially included in the Atlas.** This SWS2 is strongly related to SWS1, and actually were developed jointly during the same time period. The initial analysis literature developed in the SWS1 led towards the establishment of a first list of indicators that was the starting point for the consecutive SWS3; this first list of indicators can be found in section 3.19 of this report.
- **SWS3: Elaboration of the final list of indicators.** Definition of the indicators which were included in the Atlas according to data availability and developed of the Atlas Story Line. The final list of indicators can be found in section 4 of this report.
- **SWS4: Data collection and compilation.** It consisted in the process of data gathering and the elaboration of datasets to be mapped and analysed in the following SWSs. Issues related to data management can be consulted in section 4.2 of this memory.
- **SWS5: Final cartography production.** This SWS5 dealt with the production of more than 80 maps whose intention was to illustrate the final Atlas of the EU2020S. Considerations on how this set of maps was designed can be found in section 7 of this report.
- **SWS6: Research on the regional dimension of the selected indicators.** The thematic sections were distributed among partners (see Table 46 in section 9 of the present document). Each partners elaborated a research paper including (i) An explanation of the position of the regions or cities in each map, (ii) a systematisation for each map or groups of

maps of the regions or cities suffering *weaknesses or challenges* because of their long distance to EU2020S indications<sup>3</sup>, (iii) a *set of policy guidelines* for each map or group of maps. Results of this SWS5 are 6 research papers that were included as Annexes (Annex A to F) to this report.

- **SWS7: Development of statistical analyses.** This SWS7 consisted in the elaboration of an aggregated index of the EU2020S and also in the application of multivariate statistics to the indicators considered in the project that were available at regional level (NUTS 2). The multivariate statistics allowed us to find clusters of regions based on the position of the regions in the main EU2020S indicators but also to find factors to explain this position by considering several indicators. Detailed explanations and the results envisaged can be found in sections 5 and 6 of the present document.
- **SWS8: Elaboration of policy guidelines.** The policy recommendations can be consulted in section 8 of this report.
- **SWS9: Elaboration of the Atlas.** During this final SWS the Atlas were elaborated taking into account both the papers developed by the partners in relation to smart, sustainable and inclusive growth (SWS6) and the results of the statistical analysis carried out during SWS7 and SWS7. Specifications on the methodology and work flow followed to build the Atlas can be found in section 8 of this report.

Within this SWS9, an additional task was developed after completing the Atlas for the Draft Final Report: the simplification of the texts and a final selection of maps. This revision resulted in the Final Report. The work that was developed in this respect is in-depth explained in section 8.3 of this report.

### 3. EU2020S Analysis

The SIESTA project is devoted to considering the territorial dimension of the European 2020 Strategy (EU2020S). Obviously, the first scientific task to be carried out in this respect is to scrutinise the EU2020 itself. However, it has to be said that the document of the EU2020S establishes a dense network of connections with other directly related documents and

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<sup>3</sup> These indications from the EU2020S can be very clear and fixed, on the one hand, or can be orientations or recommendations, on the other. For instance, in the case of the headline targets (see sections 3.1 and 3.3 on which maps will show the distance to headline targets) the figure gives an exact indication of the direction that the EU2020S takes. But in other cases the EU2020S reports more a qualitative statement: for instance, it indicates that more efforts must be made in fighting against the gender inequalities in terms of unemployment.

in this respect the task embraces the wide range of documents directly linked to the EU2020S. In other words, understanding the EU2020S goes beyond strictly the document of the EU2020S.

Two foci of interest are sought in this preliminary research:

- The indicators that each piece of documentation recommends as useful, quotes as meaningful or considers in their analysis or opinions. This is done given that the main deliveries of the SIESTA project are maps elaborated using selected indicators and the selection of indicators has to be based on the analysis of the EU2020S documentation. If the basic objective of the project is to 'grasp' the territorial dimension of the EU2020S, it seems to be logical that the cartographic outputs represent the indicators that the EU2020S (and directly related documents) contain, maintain or recommend.
- The strategic decisions and policy messages that the EU2020S and related documents indicate. This kind of information constitutes a key qualitative background that gives a context to each one of the selected indicators (thus, the elaborated maps) when they are analysed, namely in SWS6. In this respect, Annex 3 of the Subsidy Contract of the SIESTA Project contains a reference to a necessary qualitative approach taking into account a "policy thinking" perspective. Thus, this section 3 constitutes the qualitative framework that has been the point of departure of the project, where the quantitative results of the indicators (represented on maps) are understood, interpreted and valued. In this sense, it has to be said that not only the directly related documents with the EU2020S are considered, but additionally those that have a clear link with the EU regional and cohesion policies; this is consistent with the territorial scope of the SIESTA project and also gives a useful qualitative dimension to discuss the obtained quantitative results and moreover it is openly demanded in the Annex 3 of the Subsidy Contract of the SIESTA Project.

In order to satisfy the basic aim, this analysis is structured as follows:

- In section 3.1, the architecture of the EU2020S documentation is clarified.
- In section 3.2, the EU2020S official document is analysed.
- In section 3.3, the official reports assessing the fulfilment of the EU2020S are scrutinised.

- In sections 3.4 to 3.6, the flagships related to the smart growth priority (see section 1 for a general clarification on this) are analysed.
- In sections 3.7 and 3.8, the flagships related to the sustainable growth priority (see section 1 for a general clarification on this) are analysed.
- In sections 3.9 and 3.10, the flagships related to the inclusive growth priority (see section 1 for a general clarification on this) are analysed.
- In sections 3.11 to 3.18, the documents considered to be essential for the regional and cohesion policy in the EU are analysed, including:
  - The documents that explicitly link the EU2020S with the regional policy through a specific Communication of the EC devoted to smart growth (section 3.11) and sustainable growth (section 3.12) and a previous document on regional policy regarding the current economic crisis (section 3.13). Importantly, no Communication of the EC has dealt with a translation of inclusive growth principles into regional policy.
  - The Treaty on European Union and the Treaty on the Functioning of the European Union, after the Treaty of Lisbon (2007) (section 3.14).
  - The Green Paper on Territorial Cohesion (section 3.15).
  - The Fifth Cohesion Report (section 3.16).
  - The Seventh Progress Report on Cohesion (section 3.17).
  - The Territorial Agenda of the European Union 2020 (TA2020) (section 3.18).

This scientific task was developed in November 2011. Afterwards, a report on the spatial dimension of the EU2020S from the Polish Presidency of the European Union (Böhme *et al.*, 2011) has been prepared. After November 2011, this document has been checked and used, especially for section 3.18, as it is basically a correlation between the TA2020 and the EU2020S. For this reason this in depth analysis of the EU2020S has been intensively updated in March 2012.

### **3.1. Architecture of the EU2020S**

The EU2020S was launched by the European Commission (EC) in November 2009 and discussed during the Spanish Presidency of the EU in

the first semester of 2010 by different EU institutions (the Parliament, the Council of Ministers, etc.), with a first overall discussion held in the European Council meeting on 25-26 March 2010 in Brussels.<sup>4</sup> The consolidated official document of the EU2020S is a Communication from the Commission published in March 2010,<sup>5</sup> being finally adopted by the European Council celebrated in Brussels on the 17<sup>th</sup> of June<sup>6</sup>.

The EU2020S consists of a double-folder of thematic organisation. On the one hand, three priorities are launched. On the other, seven flagships are established. In relation to the **priorities**, they can be defined as the basic pillars or aims that are attempted to be attained by means of the EU2020S, in an inter-related manner:

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

These three themes are understood to be the very basic framework of the EU2020S (Figure 2, representing the EU2020S architecture). In order to catalyse progress towards each one of the priorities, seven **flagship initiatives** are put forward. These are key programmes or tools to foster the achievement of the EU2020S. The seven flagships are listed as follows:

- Innovation Union.
- A Digital Agenda for Europe.
- Youth on the Move.
- Resource Efficient Europe.
- An Industrial Policy for the Globalisation Era.
- An Agenda for New Skills and Jobs.
- European Platform against Poverty.

The seven flagships are clearly attached to the three themes (Figure 2). Basically, the flagship initiatives are strategic programmes encouraged by the EC itself with its own leeway. These flagship initiatives are inter-

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4 EUCO 7/10.

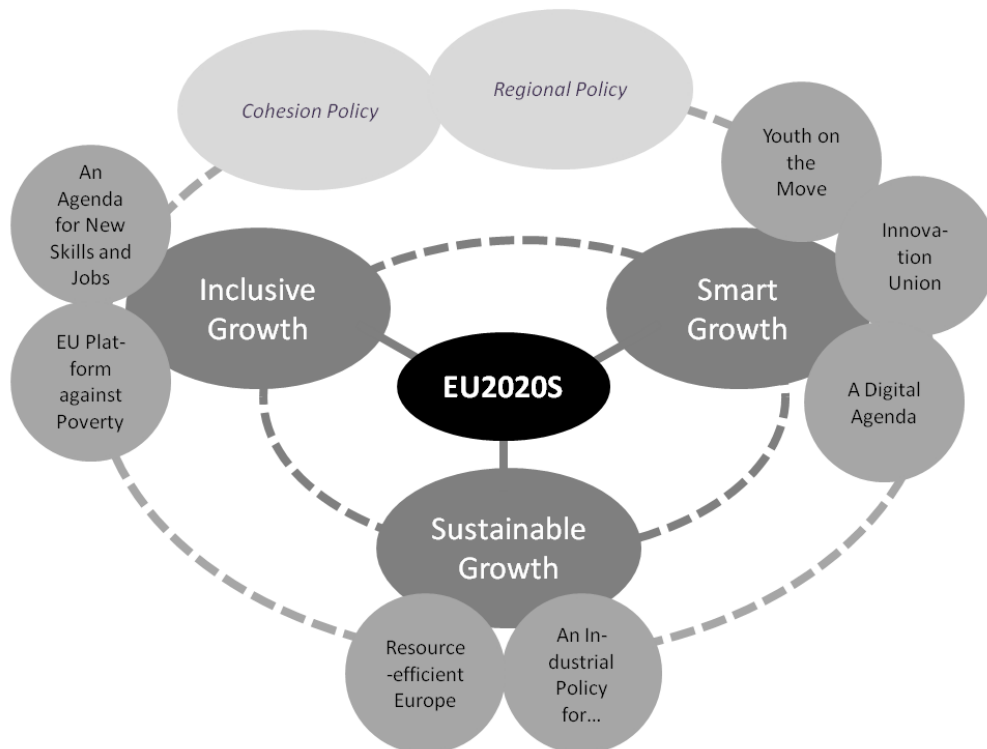
5 COM(2010) 2020, 2010-3-3.

6 “[W]e adopt “Europe 2020”, our new strategy for jobs and smart, sustainable and inclusive growth. It constitutes a coherent framework for the Union to mobilise all of its instruments and policies and for the Member States to take enhanced coordinated action.” (EUCO 13/10, p. 1).

related and are structured around the three reinforcing priorities, as represented in Figure 2. Be that as it may, each flagship has been presented in an official Communication from the Commission and these documents are extensively analysed herein in sections 3.4 to 3.10.

In addition, the official website of the EU2020S<sup>7</sup> includes progress reports on the fulfilment of the EU2020S, for the whole of the Union and for member-states, and these are also analysed herein (see section 3.3). Finally, the above mentioned EU documents related to cohesion and regional policy have also been included in Figure 2 as they are understood to be substantial for the territorial analysis of the EU2020S, especially the Communication of the EC on regional policy contributing to the achievement of the EU2020S in smart growth issues (section 3.11) and sustainable growth issues (section 3.12), as well as the Territorial Agenda of the European Union 2020 (section 3.18), which is understood to be coherent with the EU2020S.

**Figure 2 The EU2020S from the Perspective of the SIESTA Project.**



<sup>7</sup> <[http://ec.europa.eu/europe2020/index\\_en.htm](http://ec.europa.eu/europe2020/index_en.htm)> (Access 2011-10-4).

### 3.2. The EU2020S Official Document – COM(2010) 2020

The EU2020S has as a meaningful subtitle “a strategy for smart, sustainable and inclusive growth”. The document contains a preface of the President of the EC telling that the context of “economic and financial crisis” has motivated the elaboration of this EU2020S for achieving “a sustainable future”, which is “about more jobs and better lives”, acknowledging that the EU “has the capability to deliver smart, sustainable and inclusive growth, to find the path to create more jobs and to offer a sense of direction to our societies”; this constitutes the rationale of the EU2020S.

Officially, the strategy is launched for helping Europe “come out stronger from the crisis” and turning “into a smart, sustainable and inclusive economy” (p. 3). Obviously, the first overall aim for the EU2020S is growth, measured in GDP terms, as it is clearly said in p. 5, 19 or 23, among other pages of the document; that means that growth has to be understood as a valuable indicator in a EU2020S territorial analysis. Be that as it may, the basic assumption of the document is that, if the EU does nothing, the expected scenario is a long-term “decline” (p. 6) and in this context the EU2020S is framed exactly in order to avoid this negative forecasting. Somewhat ironically, the idea of “sustainable growth” is basically understood here as “continuous growth”, where “Europe is able to make a full return to earlier growth path” (p. 7); in this respect, and although measures about sustainability are present, the very idea of *sustainability* in this document is basically economical. It has to be highlighted that *development* and *growth* are not interchangeable concepts<sup>8</sup> and the option of the EU2020S is to concentrated more on the second one rather than on the first one.

As it has been said in the previous section, the EU2020S puts forward three mutually reinforcing priorities (smart growth, sustainable growth and inclusive growth) and, derived from these three priorities, seven flagship initiatives are proposed. Both the priorities and the flagships are extensively explained in the Communication, constituting most of the written document. The point that is relevant in this section is that the Communication defines the EU headline targets as well, that is, the set of specific numeric figures that are considered to be the measure of the success of the implementation of the EU2020S. Officially they are five, but in practice they are eight as some of them are in practice susceptible of constituting different numeric indicators (see Table 1). In Table 1, these

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<sup>8</sup> See, among others, Brinkman (1995), Capalbo (2008) or Blewitt (2009).

headline targets are summarised, but the other quoted objectives in the EU2020S are also included.

**Table 1 Indicators Considered in the EU2020S**

<p><i>Indicators explicitly mentioned as "headline targets" (all for 2020)</i></p>	<p>[1] Employment rate of the population aged 20-64. It is said that it should increase from the current 69% to at least 75%.</p> <p>[2] % of GDP invested in R&amp;D. It is said that the target is 3%.</p> <p>[3] Variation of greenhouse gas emissions compared to 1990 levels. It is said that they should be at least -20% and, if the conditions are right, -30%.</p> <p>[4] Share of renewable energy sources in final energy consumption. It is said that it should be at least 20%.</p> <p>[5] Energy efficiency. It is said that it should be improved at least 20%.</p> <p>[6] Drop-out rate of early school leavers. It is said that from the current 15% should be reduced to 10%.</p> <p>[7] Share of population aged 30-34 having completed tertiary education. It is said that from the current 31% it should be at least 40%. In this respect it is commented that in the US or Japan this indicator is above 40% and this should be the target for the EU.</p> <p>[8] Variation of people living below the respective national poverty lines. It is said that this should be reduced by 25%.</p>
<p><i>Obvious indicators (immanent in the EU2020S)</i></p>	<p>[9] Growth measured as GDP variation. This is the indicator quoted in p. 5, 19 or 23.</p> <p>[10] Growth measured as GDP per capita. It is immanent in the document and very traditional in the EU territorial studies.<sup>9</sup></p>
<p><i>Other indicators quoted in the document</i></p>	<p>[11] Internet velocity access. It is said that in the EU the velocity should be at least 20 Mbps and &gt;50% above 100 Mbps. This is developed in the flagship "A Digital Agenda for Europe".</p> <p>[12] % of elderly people. This is quoted as an important constraint for the welfare system.</p> <p>[13] Working hours per worker. This is mentioned in relation to the US or Japan, where it is supposed that workers work more hours on average and this seems to be substantially related to competitiveness.</p> <p>[14] Public spending. Its reduction is quoted as a constraint because of the crisis.</p> <p>[15] Share of high-tech firms. Just quoted in the sense that "it is not the absolute amounts spent on R&amp;D that count" (p. 10). Developed in the flagship "Innovation Union".</p> <p>[16] Shanghai index of universities of the world. It is quoted as a source to demonstrate that EU universities are not supposed to be well ranked.</p>

In short, the Communication indicates the basic direction that the EU economy should follow and this direction is intended to be measurable by means of the indicators, that is, the "headline targets". Be that as it may, the established targets are clearly interrelated and their own strategy gives examples of these interrelations:

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9 This consolidated measuring is based in multiple examples. For instance, in the English-speaking literature, see Hall (2002: 148); in the French-speaking, see Lévy (2011: 151); in the Spanish-speaking, see Pujadas and Font (1998: 135-138). Some specific ESPON projects such as 2.2.1 in ESPON 2006 have been basically devoted to the consideration of the EU regional imbalances in terms of economic growth measured in GDP per capita. In the grey literature, reports such as ISMERI EUROPA (2009) provides an overview of regional imbalances in Europe partially based in GDP per capita variations; also the report "Regions 2020" (2008) (see section 13).



“For instance, better educational levels help employability and progress in increasing the employment rate helps to reduce poverty. A greater capacity for research and development as well as innovation across all sectors of the economy, combined with increased resource efficiency will improve competitiveness and foster job creation. Investing in cleaner, low carbon technologies will help our environment, contribute to fighting climate change and create new business and employment opportunities” (p. 9).

It is important to note that for some of the indicators that are listed in the document, the own Communication comments that they could still be improved. For instance, on p. 9 it is said that in order to assess the R&D and innovation intensity, an indicator should be further developed.

In addition, it must be said that the accomplishment of these headline targets has become a quite controversial matter. Not only at the member state level, where indeed each nation is establishing its own national headline target adapting the general orientations of the EU (see section 3.3), but also in the sense that each one of the regions of the EU achieves the national or the EU headline targets. This is not said in the EU2020S document itself, but in late 2011 the EC by means of the 7<sup>th</sup> Cohesion Report has delivered an answer in this respect (see section 3.17).<sup>10</sup> It can be said that the headline targets are currently understood as a strategic framework, neither really compulsory nor mandatory, but a kind of indicative reference. This has also been commented by scholars, arguing that the headlines are not achievable everywhere:

“[T]he share of GDP invested in R&D, which is substantially below the 3% target in a majority of the member states, cannot reasonably reach this level in a large number of regions which are often poorly endowed in terms of a qualified workforce, cutting-edge technological equipment and the research centres linking them with the modern knowledge-based economy.” (Böhme *et al.*, 2011: 24)

The EU2020S specifies that the document constitutes “an agenda for all Member States, taking into account different needs, different starting points and national specificities so as to promote growth for all” (p. 8). The EU2020S communicates the idea that the document should positively affect the entire Union. The same is reiterated below, in the section devoted to inclusive growth: “It is also essential that the benefits of economic growth spread to all parts of the Union, including its outermost

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10 Also the keynote address of Mr Phillippe Monfort (DG REGIO) in Kraków (November 2011) alerted clearly that “Regions cannot or should not reach all their national or the EU targets”. See: <[http://www.espon.eu/main/Menu\\_Events/Menu\\_InternalSeminars/](http://www.espon.eu/main/Menu_Events/Menu_InternalSeminars/)> (Access 2012-3-5).

regions, thus strengthening territorial cohesion” (p. 16). These kind of references indicate that the EU2020S has a clear territorial translation.

Böhme *et al.* (2011: 15) understand that “[w]hile the notion of territorial cohesion appears [...] several times the document neither proposes any concrete guidelines for the territorialisation of its priorities”. In this same direction, these authors are quite critical of the EU2020S document given that it seems to forget the territorial dimension:

“Is it possible to anticipate Europe 2020’s territorial impact, and in particular the type of scenario it is likely to favour? This seems likely to be extremely difficult. [...] [T]he possible territorial outcome of ‘Europe 2020’ is far from clear. Some headline targets such as the 3% of the GDP invested in R&D, could favour growth concentration and the agglomeration of business activities [...]. Other targets could favour a more balanced geographic distribution of growth and job opportunities for less developed areas or simply turn out to be territorially neutral. Yet it seems irrelevant to venture any forecast as long as the territorial approach of Europe 2020 has not been rendered much more transparent. In its current state, the strategy is ‘territorially blind’.” (Böhme *et al.*, 2011: 25)

Indeed, these authors suggest that the lack of a territorial reading of the EU2020S may be partially explained by the fact it has been generated by the (technocratic) world of socio-economic growth (Böhme *et al.*, 2011: 27), led mainly by economists. This “world” underestimates the territorial importance for smart, sustainable and inclusive growth.

Finally, it has to be said that the above mentioned headline targets are understood to be reported at the member state scale (p. 25), by means of country reporting (see section 3.3), and taking into consideration the national targets which are adaptations of the EU headlines of the reality of each member state. Be that as it may, the SIESTA project will contribute to this reporting, but at the regional scale. This is very consistent with the following mandate of the official Communication of the EU2020S:

“All national, regional and local authorities should implement the partnership, closely associating parliaments, as well as social partners and representatives of civil society, contributing to the elaboration of national reform programmes as well as to its implementation” (p. 27).

### **3.3 The Annual Growth Survey and Other Progress Reports on EU2020S – COM (2011) and COM (2011) 815 Final**

The Annual Growth Survey shows the route that Europe must take for responding to the crisis, as the subtitle of the document in 2011 emphasises: “advancing the EU’s comprehensive response to the crisis”. The Annual Growth Survey is done in a consistent way with the EU2020S, supposed to be the framework which the Annual Growth Survey is based on. Up to now, two Annual Growth Surveys have been elaborated: the first for one 2011 (COM(2011) 11 final) and the second one for 2012 (COM(2011) 815 final). For the purposes of SIESTA Project, the first one was extensively scrutinised in October 2011, while the second has been checked later, once it has been published, in February 2012. In the second document, the basic aim herein is to highlight the differences in terms of diagnosis and policy messages with the former given that as they both are basically sharing the same table of contents. In this sense, the document for 2011 is analysed first, and then the document for 2012.

Importantly, the **Annual Growth Survey 2011** focuses on priority actions in the following three main areas, subsequently divided into ten specific actions developing the three main targets:

- Establish the base for a rigorous fiscal consolidation, considered to be a “pre-requisite for growth” (p. 4, COM(2011) 11 final). It must be noted that this macro-economic issue does not constitute a point itself in the EU2020S, but in the Annual Growth Survey 2011 it is considered to be something previous to guarantee that the objectives of the EU2020S can be achieved.
  - Implementing a rigorous fiscal consolidation.
  - Correcting macroeconomic imbalances.
  - Ensuring stability of the financial sector.
- Make structural labour reforms for attaining higher employment. Here the headline target [1] is obviously quoted. This main area includes actions in:
  - Making work more attractive.
  - Reforming pension systems.
  - Getting the unemployment back to work.
  - Balancing security and flexibility.

- Growth measures to improve the situation, basically focused on innovation, but also taking into account issues of energy. These aspects are treated by the EU2020S. This third main area embraces:
  - Tapping the potential of the single market.
  - Attracting private capital to finance growth.
  - Creating cost-effective access to energy.

Apart from the main document of the Annual Growth Survey (COM(2011) 11 final), the survey consists of three annexes, as follows:

- Annex 1: Progress Report on Europe 2020.
- Annex 2: Macro-economic Report.
- Annex 3: Draft Joint Employment Report.

**Annex 1** begins by highlighting, as the main document does as well, that “two years on, Europe is slowly emerging from recession” (p. 2). Taking into account that “Europe 2020 is the agenda that the EU and its member States have decided to ‘help Europe recover from the crisis and come out stronger, both internally and at the international level’” (p. 2), the Annex 1 is a report about how this strategic document is being implemented. In addition, it provides “policy guidance and recommendations” (p. 3) to member states. Annex 1 says that the priorities are two:

- “[T]o set budgetary policies back on track while protecting growth-enhancing policies, and to heal the financial sector swiftly to find the path to recovery” (p. 3). That is consistent the first “main area” of the COM(2011) 11 but was not part of the EU2020S.
- “[A] rapid reduction in unemployment and putting in place effective labour market reforms for more and better jobs” (p. 3). This is consistent with the second “main area” of the COM(2011) 11 and with headline target [1] of the EU2020S and some of its consequent flagship initiatives.

Then Annex 1 turns to report the different flagship initiatives that have been passed. In terms of reporting, Annex 1 notes that each member state (except in the case of two) has established its own targets developing the headline targets of the EU as a whole, but gives advice: “[t]here is a risk of a relatively low level of ambition in setting national targets and of an excessive focus on the short term, with insufficient attention to designing reform trajectories covering the whole period up to 2020” (p. 6). Annex 1 includes an overall assessment of the different headline targets in relation to the national targets, reflected in Table 2; this analysis is based on the National Reform Programmes (NRP) that each

member has delivered to the EC. Finally, Annex 1 makes an overall assessment of the different NRPs taking into account the following topics:

- A medium term macro-economic scenario.
- The national targets translating the EU2020S headline targets for each one of the member states. The systematic list is structured as an Annex of this Annex 1 (pp. 14-15 of the document).
- An identification of the main obstacles to growth and jobs.
- Main measures to improve growth.

**Annex 2** presents the European macro-economic conditions (growth, jobs, fiscal position, financial market conditions and macro imbalances) and aims "measures that have the highest potential of delivering positive macro-economic effects and that Member States could consider implementing in the coming two years" (p. 2, Annex 2). It consists of four sections:

- The section called "Europe going through particularly challenging times" shows the current scenario by examining the imbalances and the weaknesses of the worst world economic crisis since the Great Depression in the 1930s.
- The section called "Reining in public debt through a rigorous and durable fiscal consolidation" is focused on the need to set public finances back on track.
- The section called "Healing the financial sector swiftly to find the path to recovery" makes the case for recovering the financial sector swiftly.
- The section called "Structural reforms to support growth and correct macroeconomic imbalances" aims at the urgency of structural reforms to correct macroeconomic imbalances and to fix the ailing growth drivers.

**Annex 3** focuses on employment issues. This is done through three main sections: the employment situation, guidelines for the future and the results of the NRPs in relation to employment. The document begins by explaining the fragile labour market situation; for instance, long-term unemployment is increasing across all the population groups and the crisis has aggravated the situation for the low-skilled and non-EU migrants. A possible solution aims to identify priority areas for labour growth, enhancing reforms and trying "to create more flexible, secure and inclusive labour markets" (p. 4, Annex 3). In this respect, integrated actions are needed to achieve full employment, especially involving women in the labour market and achieving a strong human capital.

**Table 2 Indicators Considered in the Annual Survey Growth 2011**

<p><i>Indicators explicitly mentioned as "headline targets" (all for 2020), and their consideration in Annex 1</i></p>	<p>[1] Employment rate of the population aged 20-64. Annex 1 states that employment rates in the EU are lower than those of the US and Japan. The national proposed targets range "from 62.9% (Malta) to 80% (Sweden)" (p. 7), the average of the national targets being 72.4-72.8%.</p> <p>[2] % of GDP invested in R&amp;D. Annex 1 mentions that there is a great gap between the US and other advanced economies in relation to the EU, which "lags significantly behind" (p. 7). The national proposed targets are below the EU headline target of 3%; however, the EC acknowledges that percentages of 2.7 or 2.8% "represent a significant effort, particularly in the current budgetary context" (p. 7). Annex of Annex 1 provides a range from 0.5% (Cyprus) to 4% (Finland and Sweden), the average of the national targets being 2.7-2.8%.</p> <p>[3] Variation of greenhouse gas emissions compared to 1990 levels. Annex of Annex 1 provides a range from +20% (Bulgaria) to -20% (Denmark and Ireland), the average of the national targets being -20%.</p> <p>[4] Share of renewable energy sources in final energy consumption. Annex of Annex 1 provides a range from 10% (Malta) to 49% (Sweden), the average of the national targets being 20%.</p> <p>[5] Energy efficiency. Annex 1 states that member States "have taken limited ownership of this target", and even some of them do not provide indications while "others use different methodologies" (p. 8). Generally speaking, the EC thinks that nations are likely to be focused on targets under 10% and this is "worrying" (p. 8) as the EU target is 20%. Importantly, Annex of Annex 1 specifies that energy efficiency is understood as "reduction of energy consumption in Mtoe" (p. 14). Annex of Annex 1 provides a range from 0.24 (Malta) to 43 (France), but this should be measured as variation and not as an absolute amount. The average of the national targets is less than 10%.</p> <p>[6] Drop out rate of early school leavers. Although the EU target is less than 10%, the average of the different nations is above this percentage, 10.5% (p. 9). Annex of Annex 1 provides a range from 4.5% (Poland) to 29% (Malta), the average of the national targets being 10.5%.</p> <p>[7] Share of population aged 30-34 having completed tertiary education. Although the EU target is more than 40%, the average of the different nations is below this percentage, 37.3% (p. 9). Annex of Annex 1 provides a range from 26.7% (Romania) to 48% (Belgium), the average of the national targets being 37.3%.</p> <p>[8] Variation of people living below the respective national poverty lines. "The target is defined on the basis of three indicators" (p. 9, see a further section of this table). The EC thinks that "a majority of countries have set targets, although they do not yet meet yet the level of ambition agreed on by the European Council. Most Member States have used the three agreed indicators to define the EU target [...] [, but] [s]everal countries have still not set their target" (p. 9). The figures in Annex of Annex 1 are quantities, not percentages.</p>
<p><i>Measure of growth often quoted</i></p>	<p>[9] Growth measured as GDP variation. This is quoted on p. 3, among others, where it is predicted that growth will be around 1.5% until 2020 and this figure is considered to be "low". However, this percentage is from the first semester of 2011, when it was perceived, as the Annual Growth Survey acknowledges, that there were "signs of economic recovery" (p. 2). From the current perspective, even this seems to be very optimistic.<sup>11</sup></p>
<p><i>Other indicators quoted in the main document COM(2011) 11</i></p>	<p>[14] Public expenditure. "Public expenditure must be put on a sustainable track as a pre-requisite for future growth" (p. 4).</p> <p>[17] Retirement age linked with life expectancy. It is said on p. 6 that retirement age "should increase" in order to link with life expectancy.</p> <p>[18] Unemployment rate. "It is priority a rapid reduction in unemployment through labour market reforms" (p. 9), this is quoted everywhere in the document. Obviously, it has links with indicator [1], but it is not strictly the same.</p>
<p><i>The three indicators developing headline target [8]</i></p>	<p>[19] At-risk-of poverty rate.</p> <p>[20] Severe material deprivation.</p> <p>[21] People living in households with very low work intensity.</p>

11 This comment was written in November 2011.

<p>(quoted in Annex 1), see section 3.10 of this document</p>	
<p>Indicators used in Annex 2</p>	<p><i>Europe going through particularly challenging times</i></p> <p>[22] Decomposition of GDP growth. It is not really an indicator, but several indicators that reflect the percentage of GDP growth for demographic components, labour market components, labour productivity, native population, net migration, share of working age population, youth participation, etc.</p> <p>[1] Employment rate of the population aged 20-64.</p> <p>[23] Real primary expenditure versus real GDP growth, taking into account the average growth of real primary expenditure and the average growth of real GDP in percentage.</p> <p>[24] Evolution of price competitiveness relative to the rest of the euro area.</p> <p>[9] Growth measured as GDP variation.</p> <p>[25] Youth unemployment. "Youth unemployment exceeds 20% in more than half of the EU Member States and reaches 42% in one country (Spain)" (p. 6).</p> <p>[26] Public debt level in % of GDP. "At the end of 2010 gross government debt is expected to have climbed to around 84% of GDP in the euro area and around 79% of GDP in the EU, some 20 percentage points above the 2007 levels" (p. 7).</p> <p><i>Reining in public debt through a rigorous and durable fiscal consolidation</i></p> <p>[26] Public debt level in % of GDP.</p> <p><i>Healing the financial sector swiftly to find the path to recovery</i></p> <p>[27] Bank lending in the EU, taking into account the GDP, loans to non financial corporations and loans to households.</p> <p>[28] Non-performing loans in the EU, as a percentage of total loans.</p> <p>[29] Public interventions in the EU banking sector, in percentage of GDP. It is said that public support to banks could cause possible distortions in the financial sector (p. 15).</p> <p>[30] Banking sector assets abroad.</p> <p>[31] Total banking sector assets, in percentage of GDP. It is said that such an indicator expresses the vulnerability of some Member States in case of a systematic crisis (p. 16).</p>
<p>Indicators used in Annex 3</p>	<p>[32] Employment rate by gender. "There is a clear need to foster women's greater involvement in the labour market. The overall employment rate of women in Europe is still only 62.4% (20-64)" (p. 4).</p> <p>[33] Percentage of jobs with high or medium level skills. No mention about how this is estimated, but it is said that by 2020 "85% of jobs will require high or medium level skills" (p. 7).</p> <p>[34] Percentage of jobs with low level skills. No mention about how this is estimated, but it is said that by 2020 "the proportion of jobs for the low-qualified will reduce to 15%" (p. 7).</p> <p>[35] Lifelong learning participants. The participation is seen as "too low" (p. 8).</p> <p>[36] Investment in higher education (universities), measured in percentage of GDP. "For a modern and well-performing university system, a total investment of 2% of GDP is the minimum required for knowledge-intensive economies" (p. 8).</p> <p>[37] Social expenditure, measured in percentage of GDP. "Social expenditure is likely to reach 30.7% of GDP in 2011, against 27.5% in 2007" (p. 12), but it is not explained what is understood exactly by 'social expenditure'.</p>

The Annual Growth Survey devoted to 2012 was finished at the end of 2011, around eleven months later than the previous one. It has the same structure and what is basically relevant herein is the Annual Growth

Survey itself (COM(2011) 815 final) and Annex 1, the latter being the document focused on the EU2020S fulfilment. The point of departure is different from that of 2011: “economic recovery has come to a standstill”, “GDP is likely to stagnate in the coming year [2012]” and “unemployment levels are likely to remain high [...], exacerbating the social impact of the crisis” (p. 2, COM(2011) 815 final). That can be seen as a shift in the sense that the optimistic perspective of the previous Annual Growth Survey, predicting a recovery from the crisis, has been replaced by a dominant pessimistic vision. In order to face this distasteful scenario, the Annual Growth Survey includes five priorities, putting a strong emphasis “on the need for implementation” (p. 3). That means that most of the recommendations included in the Survey of the year before are clearly perceived as not having been implemented. Indeed two of them are repeated, as is clear in the first two points of the following list of priorities for 2012:

- Pursuing differentiated growth-friendly fiscal consolidation is an aim continuing with the objective of the year before devoted to fiscal consolidation. Basically, what is expected is to contain government debt (indicator [26] is here quoted again) and to prioritise expenditure in “growth-friendly” sectors “such as education, research, innovation and energy” (p. 4). What is mostly new is the section devoted to taxation coordination.
- Tackling unemployment and the social consequences of the crisis is basically the continuity of the aim for 2011 on labour market reforms. Most of the indicators on unemployment such as unemployment itself [18] or youth unemployment [25] are over-quoted.
- Restoring lending to the economy is understood as supporting growth by means of a “robust banking sector”. This priority is devoted to the financial sector.
- Promoting growth and competitiveness for today and tomorrow is a section attempting to detect “growth levers”:
  - The digital single market: high-speed broadband connections, ICT, etc.
  - An internal market for services, pursuing the Services Directive implementation through the EU.
  - The external growth dimension, especially quoting South Korea.

This should be accompanied by mobilizing the EU budget for growth (facilitating some EU budget adjustments) and by delivering



measures to “fast track growth” that immediately “boost growth” (p. 9).

- Modernising public administration by reducing administrative burdens or issuing planning permits in the implementation of Trans-European Infrastructure.

Annex 1 for the Annual Growth Survey 2012 defends the EU2020S in the current standstill within the ongoing crisis: “this strategy has become more relevant than ever” (p. 2). Annex 1 assesses the headline targets of the EU2020S and the respective national ones in this respect and states the same as in Annex 1 for 2011. What is different here is the report on the progress for 2011:

- [1]: “In the course of 2011 there has been no substantial progress” (p. 3).
- [2]: “[L]ittle progress is foreseen in 2011” (p. 3).
- [3], [4] and [5]: For [3], “recent emission reduction projections suggest that the EU as a whole would meet its 20% greenhouse gas emission reduction target” (p. 4). However, for energy efficiency [5] a report in 2012 will provide an overall analysis and in any case it is said, as it was in the previous Annex 1 (see Table 2), that the national headlines “are insufficient to meet” the EU level target (p. 3). For renewable energy [4], no new information is facilitated.
- [6] and [7]. No statistics for 2011 are analysed, but there is some optimism for achieving [7] for the whole of the EU for 2020, while [6] is seen as quite difficult on the basis of current national commitments (as it was previously, see Table 2).
- [8] is also seen as difficult to achieve and national targets are also seen as insufficient.

Annex 1 includes an evaluation of each one of the flagship initiatives and three new points are raised, that are basically quoted in the main document of the Annual Growth Survey 2012: obtaining more from the single market (for instance by means of a wide and true implementation of the Services Directive), maximising the impact of EU funds (reprogramming or (re-)prioritising them) and exploiting the potential of the global market.

### **3.4 The Flagship “Innovation Union” – COM (2010) 2020**

This flagship is delivered to improve framework conditions and access to finance for research and innovation so as to ensure that innovative ideas

can be turned into products and services that create growth and jobs, because “achieving our target of spending 3% of EU GDP on R&D by 2020 could create 3.7 million jobs” (p. 3). Although Europe starts from a position of strength in innovation, taking into account that some EU companies are leaders and that some regions are among the most innovative in the world, some competitors are doing very well, for instance attracting overseas researchers. In this environment, Europe must “develop its own distinctive approach to innovation which builds on its strengths and capitalizes on its values by” (p. 7):

- Focusing on innovations in these sectors identified in EU2020S, for instance key technologies. In a specific section devoted to the need of developing “European Innovation Partnerships”<sup>12</sup> several areas are specifically quoted and they seem to be consistent with the EU2020S (p. 25): climate change, energy efficiency, greenhouse gases, digital society, resource-efficient foodstuffs, ageing population, etc.
- Pursuing a broad concept of innovation, both research-driven innovation and innovation in business.
- Involving all actors and all regions in the innovation cycle. That constitutes a clear link between the innovation policy and the territorial agenda, as it is said that “all regions in Europe [...] [should focus] on their own strengths (‘smart specialisation’)” (p. 8), an idea that is present in the Annual Growth Surveys.

Firstly, the flagship begins by taking into consideration the need to promote excellence in education and skills development. In R&D it is said that there should be “attractive employment conditions in public research conditions” (p. 9), resulting in an increasing number of researchers. In addition, it is proposed that the EU and member states should put into place “integrated policies to ensure that leading academics, researchers and innovators reside and work in Europe and to attract a sufficient number of highly skilled third country nationals to stay in Europe” (pp. 27-28). Apart from that, the necessity of ranking universities performance is stated. In parallel, an integrated European Research Area is desired, as nowadays there is “a huge administrative burden” from all the involved levels of government and in this respect it is necessary to “simplify procedures” and promote cross-border cooperation. This single Research Area entails encouraging the mobility of researchers across countries.

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12 This concept is developed on pp. 22-26 and it is about concentrating research in relation to societal challenges and bringing together research, demonstrations, investments, standards, demand, etc., rather than taking these steps independently.

Moreover, the already existing EU funding instruments on research are considered successful, but a bigger involvement of SMEs is envisaged.

Secondly, there is a specific section on getting good ideas to market. The key idea here is financing these good ideas, although it is clear that because of the crisis banks are not really helping. For this reason a greater role of the European Investment Bank Group. At the same time, a cheap and simple EU patent is meant to be developed, given that as now there is a patent for each one single member state. Also, public procurement from member states and regions seems to be important for promoting innovative products and services, but the fragmentation between member states makes this possibility more difficult. One point is made in the case of creative industries, that is, design.

A particular section is devoted to territorial cohesion in the sense that it is necessary to spread "the benefits of innovation across the Union" (p. 20). It is clearly stated that "Europe must avoid an 'innovation divide' between the strongest innovating regions and the others" (p. 20); structural (regional) funds are supposed to shift in order to be more orientated to innovation and less to traditional objectives.<sup>13</sup> Also a 'social orientation' of innovation is sought through a promotion of "social innovation" through the European Social Fund (ESF) (p. 22).

At the end of the document a section on "measuring progress" is included. Notably this section makes a clear reference to indicators, not only the headline target [2], but also "a new innovation indicator" whose "development will require around two years" (p. 29). That means that this will only be available in late 2012. However, the flagship initiative includes a set of possible indicators for measuring innovation before this indicator is even developed. Annex 2 of the flagship constitutes a systematic list of indicators that can be used to score performance in research and innovation; the list is accompanied by the possible data sources for each indicator. Be that as it may, this Annex 2 list is not completely reflected in Table 3, which constitutes a selection based on the intention of choosing at least a representative and useful indicator for each one of the eight sections of the list.

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13 Apparently this has been the aim of Regional Policy Contributing to Smart Growth in Europe 2020 – COM(2010) 553 end (see section 3.11).

**Table 3 Indicators Considered in the Flagship “Innovation Union”**

<p><i>“Headline targets” of the EU2020S</i></p>	<p>[2] % of GDP invested in R&amp;D. The current figure is currently 0.8% of GDP less than the US and 1.5% less than Japan (p. 6). Directly quoted in Annex 2, p. 36.</p> <p>[3] Variation of greenhouse gas emissions compared to 1990 levels. Greenhouse gas emissions in cities and in transport sector are considered to be possible fields for specialised innovation (p. 25).</p> <p>[7] Share of population aged 30-34 having completed tertiary education. In the EU it is “69% lower than the US and 76% lower than Japan” (p. 6). Directly quoted in Annex 2, p. 36.</p>
<p><i>Other indicators directly quoted in the document (including a selection of those indicators quoted in Annex 2)</i></p>	<p>[38] Public investment in education. It is said that the EU and member states need to continue to invest in education (pp. 2, 6).</p> <p>[39] Public investment in ICTs. It is said that “the EU and Member States need to continue to invest in ICTs” (p. 2) and “by 2012, agreement should be reached with international partners on the development of research infrastructures, including ICT infrastructures” (p. 28).</p> <p>[40] Research ranking. The need of developing a research index is state, based on the efforts in this respect that have already taken place. This is supposed to be “an independent multi-dimensional international ranking system to benchmark university performance” (p. 9). It is predicted for 2011.<sup>14</sup></p> <p>[41] Number of researchers. It is firstly said that other countries are attracting some EU researchers (p. 7), because their “conditions are more favourable”. On p. 9 it is said that the number of researchers as a share of the population is below the US, Japan and other countries, and that the “EU will need at least one million new research jobs if it is to reach the R&amp;D target of 3%. The number of researchers required is significantly higher, as many researchers will retire over the next decade”.</p> <p>[11] Internet velocity access. It is said that it is necessary to “promote European competitiveness in the digital society through faster access to information” (p. 25).</p> <p>[42] New doctorate graduates per 1,000 people aged 25-34. Quoted in Annex 2, p. 36.</p> <p>[43] Percentage of youth aged 20-24 having attained at least upper secondary level education. Quoted in Annex 2, p. 36.</p> <p>[44] International scientific co-publications per million people. Quoted in Annex 2, p. 36.</p> <p>[45] Non EU-doctorate students per million people. Quoted in Annex 2, p. 36.</p> <p>[46] Business R&amp;D expenditures as % of GDP. Quoted in Annex 2, p. 36.</p> <p>[47] Innovative SMEs (more than 10 employees) collaborating with others as % of SMEs. Quoted in Annex 2, p. 37.</p> <p>[48] SMEs (more than 10 employees) introducing product or process innovations as % of SMEs. Quoted in Annex 2, p. 37.</p>
<p><i>“Available indicators” in innovation while the single indicator does not exist (p. 29)</i></p>	<p>[49] Patent applications. According to Annex 2, this has to be measured per billion GDP (p. 37).</p> <p>[50] Contribution of medium-high-tech and high-tech products to the trade balance. According to Annex 2, this has to be measured as a percentage of total exports (p. 37).</p> <p>[51] Employment in knowledge-intensive activities. According to Annex 2, this has to be measured as a percentage of total employment (p. 37).</p>

14 There are several indexes in this respect. For instance, the Shangai index, indicator [16], which has received criticism. It is probably because of this that the EU has funded others such as <<http://www.researchranking.org/>> (Access 2011-11-14).

### **3.5. The Flagship “A Digital Agenda for Europe” – COM (2010) 245 Final**

This flagship is delivered to speed up the roll-out of high-speed internet and reap the benefits of a digital single market for households and firms in the context of a digital single market. The flagship is based in ICT, most notably the Internet, considered to be “a vital medium of economic and societal activity: for doing business, working, playing, communicating and expressing ourselves freely” (p. 3). The confidence in the power of ICT and Internet is based in the assumption that “[t]he development of high-speed networks today is having the same revolutionary impact as the development of electricity and transportation networks had a century ago” (p. 4).

The document recognises that Europeans feel frustration when ICT do not achieve their promise of better public services and economy prosperity, taking into account that “Europe is not equipping itself adequately to prosper in this growth sector of the knowledge economy” (p. 5). In this respect, the EC identifies at the beginning of the flagship the seven most relevant obstacles:

- Fragmented digital markets.
- Lack of interoperability.
- Rising cybercrime and risk of low trust in networks.
- Lack of investment in networks.
- Insufficient research and innovation efforts.
- Lack of digital literacy and skills.
- Missed opportunities in addressing societal challenges.

The flagship “systematically tackle these seven problem areas” (p. 6). In order to do so, the initiative encompasses eight action areas and recognises that commitment is necessary not only from the EC, but also from member states, including regional authorities. The action areas are as follows:

- A vibrant digital single market because “it is time for a new single market to deliver the benefits of the digital era” (p. 7). Some actions proposed by the Commission are: simplifying copyright procedure, creating a legal framework to facilitate the dissemination of cultural works in Europe, promoting cross-border and European licenses, ensuring the completion of the Single Euro Payment Area, protecting the shops online, etc.

- Assuring interoperability and standards given that “we need effective interoperability between ICT products and services to build a truly digital society” (p. 14). Some specific proposals are: promoting appropriate rules for essential intellectual property rights and using common standards to provide guidance for the link between ICT standardisation and public procurement to help public authorities.
- Trust and security development because “Europeans will not embrace technology they do not trust” (p. 16). First at all, it is clear that users must be safe and secure when they use internet. On the other hand, threats and strengthening security in the digital society is a private and public responsibility. Actions in this respect include establishing a European cybercrime platform and combating cyber attacks.
- Ensuring fast and ultra fast internet access because “we need very fast Internet for the economy to grow strongly and to create jobs and prosperity, and to ensure citizens access the content and services they want” (p. 18). It is very important to “ensure that by 2020 all Europeans have access to much higher Internet speeds of above 30 Mbps and 50% or more of European households subscribe to Internet connections above 100 Mbps” (p. 19) and these figures clearly lead to specific indicators in Table 4. At the same time it is a strategic fight against the digital gap, especially to ensure coverage in remote and rural areas.
- Reinforce the investments in research and innovation because “Europe must invest more in R&D and ensure our best ideas reach the market” (p. 21) given that Europe “continues to under-invest in ICT related research and development” in comparison with the US (p. 22). In this respect it is possible to identify three main problems:
  - Weak and dispersed public R&D effort, for instance because the public sector invests less in the EU than in some competing economies.
  - Market fragmentation and dispersion of financing.
  - Europe does not progress adequately in ICT innovations.
- Enhancing digital literacy, skills and inclusion as “the digital era should be about empowerment and emancipation; background or skills should not be a barrier to accessing this potential” (p. 24). However, it is said that 30% of Europeans have never used the Internet. Thus citizens needed to educate on how to use ICT and

digital media as a smart tool to improve education and skills among students and workers. As a specific action it is envisaged that the ESF regulation post-2013 proposes digital literacy and competences as a priority.

- ICT enabled benefits for EU society because “smart use of technology and exploitation will help us to address the challenges facing society like climate change and ageing population” (p. 27). This is based on the fact that it is clear that ICT offer new opportunities to less resource-intensive products and services that support sustainable healthcare, promote cultural diversity and reduce costs and save time for public administration citizens and businesses. A specific point is made in relation to eGovernment, for instance by fostering mutual recognition of e-identification and e-authentication across the EU based on online authentication services to be offered in all member states.
- Finally, the Digital Agenda contains a section devoted to international aspects, for instance by promoting the internationalisation of internet governance.

The document contains two annexes. The first includes the legislative actions that are committed by the EC in order to develop the flagship. The second is a systematic list of performance targets based on a previous document of the EC;<sup>15</sup> this list is reflected in Table 4 but, like in the previous analysis of the flagship Innovation Union, all the indicators listed therein are not reproduced herein in Table 4, but only those considered representative of the six sections in which the list is divided.

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15 i2010 HIGH LEVEL GROUP (2009): *Benchmarking Digital Europe 2011-2015*. Available at <[http://ec.europa.eu/information\\_society/eeurope/i2010/docs/benchmarking/benchmarking\\_digital\\_europe\\_2011-2015.pdf](http://ec.europa.eu/information_society/eeurope/i2010/docs/benchmarking/benchmarking_digital_europe_2011-2015.pdf)> (Access 2011-11-10).

**Table 4 Selection of Indicators Considered in the Flagship “A Digital Agenda for Europe”**

<p><i>“Headline target” of the EU2020S</i></p>	<p>In practice the only mention of headline targets is a specific application of [5] (energy efficiency), concretely in this flagship it is stated that “[b]y 2020 at least 20% overall reduction in energy use on lighting”.</p>
<p><i>Other indicators directly quoted in the document (including a selection of those indicators quoted in Annex 2)</i></p>	<p>[52] Percentage of household access to broadband. It is stated that the objective is “to bring basic broadband to all Europeans by 2013” (p. 19). In 2008 that was 93% (p. 40).</p> <p>[11] Internet speed. The flagship “seeks to ensure that, by 2020, (i) all Europeans have access to much higher internet speeds of above 30 Mbps and (ii) 50% or more of European households subscribe to internet connections above 100 Mbps” (p. 19). According to Annex 2, the former is considered to be fast broadband, while the latter is understood as ultra-fast broadband (p. 40).</p> <p>[53] Percentage of citizens using the internet for accessing eGovernment services. “In 2009, only 38% of individuals aged 16-74 had used eGovernment services in the last 12 months” (p. 41), but it is proposed that for 2015 50% of citizens must use eGovernment (p.31).</p> <p>[54] Percentage of population buying online. “50% of the population should be buying online by 2015” (p. 40), the current data being 37% for individuals aged 16-74. Reasons for not buying online are systematised on p. 12.</p> <p>[55] Enterprises purchasing and selling electronically. “33% of SMEs should conduct online purchases/sales by 2015” (p. 40). This was only 12% in 2008, but 24% if only purchasing is considered.</p> <p>[56] Roaming average. “The difference between roaming and national tariffs should approach zero by 2015” (p. 40). It is understood as a clear indicator of single market achievement for telecom services.</p> <p>[57] Internet use. It is proposed that regular Internet use should increase “from 60% to 75% by 2015” (p. 41).</p> <p>[58] Internet use for disadvantaged people. It is proposed that it should increase “from 41 % to 60% by 2015” (p. 41).</p> <p>[59] Population that has never used the Internet. In 2009, 30% of individuals aged 16-74 had never used Internet. It is necessary to “halve the proportion of population that has never used the Internet by 2015” (p. 41).</p> <p>[60] Public investment in ICT R&amp;D. It is proposed to double public investment from 5.7 billion nominal Euros in 2007 to 11 billion (p. 41).</p>

### **3.6 The Flagship “Youth on the Move” – COM(2010) 477 Final.**

This flagship is delivered to enhance the performance of education systems and to facilitate the entry of young people into the labour market, as they are “key to [...] achieving the Europe 2020 objectives” (p. 2). Like the subtitle of the initiative clearly states, the flagship is done in order to “unleash the potential of young people to achieve smart, sustainable and inclusive growth in the European Union”. In other words, its aim is “to respond to the challenges young people face and to help them succeed in the knowledge economy”. The initiative is focused on four main lines of action:

- Actions throughout the lifelong learning system, from school to upper levels, including Vocational Education and Training (VET).



Apart from actions devoted to reduce early school leaving, attention is paid to teach youth people about the knowledge economy and society (communication in foreign languages, ICT, e-learning tools, etc.) and to develop a common language between universities and business.

- Measures for raising the participation in higher education or equivalent. This has to be done through promoting the attractiveness of higher education for the knowledge economy. On the other hand, European universities need higher investments to position them among the best universities in the world. In this point, it is necessary to support the reform and modernisation of higher education. Here the need to develop a ranking system of universities is also quoted.
- EU's support for learning mobility, with the clear statement that "by 2020 all young people in Europe should have the possibility to spend a part of their educational pathway abroad" (p. 3). This is envisaged as "studying and working abroad is particularly attractive for young people" (p. 8). In this respect, it is noted that it is necessary to it make easier for young students and workers to study and work within the Union to acquire new knowledge, skills and competences; actions to improve the situation include social security coordination.
- Improving the employment situation of young people as it is clear that Europe needs to implement measures to reduce youth unemployment. Some proposals are as follows: helping young people to get the first job, putting young people in contact the labour market or providing social safety nets for young people with a combination of adequate income support, inclusive labour markets and access to quality services. In addition, there is a section devoted to supporting young entrepreneurs, including self-employment and facility for micro-finance.

Some of the envisaged measures can be developed through the already existing programmes, for instance those included in the ESF (that could be partially shifted in the current financing period in order to maximise investments in youth people) or Erasmus. Indeed Erasmus is seen as a kind of benchmark that might be transferred to business through the initiative "Erasmus for young entrepreneurs", to be included in the framework of Marie Curie programme. Finally, although it is said that the flagship should be monitored, no specific indicators are proposed for reporting progress in this respect.

**Table 5 Indicators Considered in the Flagship “Youth on the Move”**

<p><i>“Headline targets” of the EU2020S</i></p>	<p>[1] Employment rate of the population aged 20-64. “In order to reach the 75% employment target for the population aged 20 to 64, the transition of young people to the labour market needs to be radically improved” (p. 2). In p. 12 it is said that the priorities in the fight against youth unemployment should be considered in practice “as a contribution towards” the headline target [1].</p> <p>[6] Drop out rate of early school leavers.</p> <p>[7] Share of population aged 30-34 having completed tertiary education.</p>
<p><i>Other indicators directly quoted in the document</i></p>	<p>[25] Youth unemployment. Is considered to be “unacceptably high at almost 21%” (p. 2).</p> <p>[61] E-skilled jobs in percentage of total jobs. It is supposed that e-skilled jobs will be required but in the EU there is a shortage (p. 2).</p> <p>[62] ICT practitioners. It is supposed that ICT practitioners will be required but in the EU there is a shortage (p. 2).</p> <p>[63] Students studying abroad. It is said that “by 2020 all young people in Europe should have the possibility to spend a part of their educational pathway abroad” (p. 3). It embraces indicator [65].</p> <p>[64] Investment in the university system, including public and private funding combined, and expressed as percentage of GDP. It is clearly stated that the EC target is at least 2% (p. 6).</p> <p>[40] Research ranking. Mentioned as in section 4 and also predicted that the EC will develop its own system (p. 7).</p> <p>[65] University students studying abroad. The “Bologna” Ministers for Higher Education said in 2009 that “at least 20% of those graduating in the European Higher Education Area should have had a study or training period abroad by 2020” (p. 9).</p> <p>[66] Percentage of European 20-24 year olds not working or being educated. It is now in “an astonishing 15%” and coined as “NEET: neither in employment, education or training” (p. 13). This population is considered to be at risk of being permanently excluded from the labour market and dependent on benefits.</p>
<p><i>Other indicator indirectly quoted in the document</i></p>	<p>[67] Vocational Education and Training (VET) students. The indicator is not in the flagship, but the importance of VET is noted, as “[p]rojections foresee that around 50% of all jobs in 2020 will continue to depend on medium-level qualifications provided through VET” (p. 5).</p>

### **3.7. The Flagship “A Resource-efficient Europe” – COM(2011) 21 Final**

The overall aim of this flagship is “to support the shift towards a resource-efficient and low-carbon economy” (p. 3) that is efficient in the way it uses all resources: raw materials, food, soil, water, air, biomass and ecosystems. In this respect, it is sought to decouple the economic growth of the EU from resource and energy use, to reduce CO<sub>2</sub> emissions, to increase the use of renewable energy sources, to modernise the transport sector, to promote energy efficiency and to encourage greater energy security. All these strategies are supposed to contribute to enhance competitiveness by reducing resource use and creating new business options, thus bringing “real economic benefits to the EU economy for decades to come” (p. 3).

This flagship is based on the assumption that “[c]ontinuing our current patterns of resource use is not an option” (p. 2), thus a considerable change should take place. “The EU has already shown that progress on resource efficiency is possible” (p. 3), for instance because of the extension of recycling practices and overall greenhouse gas emissions reduction since 1990, while in parallel the economy has experimented growth in these two decades (-10% of greenhouse gas emissions while economy has grown by about +40%).

In order to attain the basic aims, the flagship is broken down into different initiatives, officially called “roadmaps” (p. 5), which are explained as follows:

- Those aiming at the low-carbon economy by cutting greenhouse gas emissions, including the industrial sector.
- Those achieving this low-carbon economy in the energy sector, including raw materials extraction and considering waste and recycling issues as well. Policies related to energy have been delivered in a specific Communication.<sup>16</sup>
- Those achieving this low-carbon economy in the transport sector, as has been specifically stated in the recent White Paper on transports policy.<sup>17</sup> Among other measures, this White Paper comments that the reduction of greenhouse gas emissions for the transports sector should be less than the overall headline targets of greenhouse gas emissions (see Table 6). Additionally, the new Trans-European networks (TEN) planned in 2001 are consistent with this overall aim.
- Policies in relation to biodiversity conservation, given that “land used to produce food may compete with land use for energy and both may compete with land which supports biodiversity or provides ecosystem services such as absorbing carbon from the atmosphere” (p. 5). In this respect, it is forecasted a “new EU biodiversity strategy for 2020 to halt further loss to and restore biodiversity and ecosystem services in the light of pressures on ecosystems” (p. 6). This is expected to be basically managed by means of a Communication on biodiversity by the EC in 2011.<sup>18</sup>

Most of these fields of action are clearly interrelated with consolidated EU policy domains such as the CAP, the TEN or the cohesion policy. In this

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16 Energy 2020. A Strategy for Competitive, Sustainable and Secure Energy – COM(2010) 639 end.

17 Roadmap to a Single European Transport Area – Towards a Competitive and Resource Efficient Transport System – COM(2011) 144 end.

18 Our Life Insurance, Our Natural Capital: an EU Biodiversity Strategy to 2020 – COM(2011) 244 end.

respect, it is stated that “[p]roposals to reform these policies will help align them with current policy priorities, in particular with the Europe 2020 Strategy and this flagship initiative” (p. 11), which means that this Communication COM(2011) 21 is supposed to be the “point of departure” or framework of reference for further legislative developments. In other words: “resource efficiency requires action in such a broad range of areas” (p. 8).

The Communication includes a specific reference to the need for developing indicators “to cover issues such as the availability of natural resources, where they are located, how efficiently they are used, waste generation and recycling rates, impact on the environment and biodiversity” (p. 9). It is said that the EC is working to ensure that these indicators are developed, but they are still not available. In this respect, most of the indicators quoted in the Communication (see Table 6) are those present in the EU2020S itself (see Table 1). Be that as it may, the Communication is based on a reference scenario that predicts that the targets of the EU2020S will be accomplished, including that GDP growth will be recovered; apart from these achievements, different indicators considered to be demonstrating the fulfilment of the flagship are also directly or indirectly quoted in pp. 13-15 of the Communication – some of them being mentioned in Table 6.

**Table 6 Indicators Considered in the Flagship “A Resource-Efficient Europe”**

<p><i>“Headline targets” of the EU2020S</i></p>	<p>[3] Variation of greenhouse gas emissions compared to 1990 levels. It is said that they should be at least -20% and, if the conditions are right, -30%. In this Flagship it is added that they should be cut “by 80-95%, as part of global efforts to fight climate change” for 2050 (p. 5).</p> <p>[4] Share of renewable energy sources in final energy consumption.</p> <p>[5] Energy efficiency. In this flagship “energy efficiency” is basically understood to be “energy savings” (pp. 6, 11), a clarification that makes the calculation of this indicator easier.<sup>19</sup> Energy consumption is also quoted in the respect; for energy consumption, it is said that “[d]ecreasing EU energy consumption by 1% would mean that we would not need the equivalent of 50 coal power plants or 25,000 wind turbines” (p. 4).</p>
<p><i>Other indicators directly quoted in the document</i></p>	<p>[68] Patent rates in clean energy technologies compared to patent rates in fossil technologies. It is said that the first rate has outpaced the second rate since the Kyoto Protocol was passed in 1997 (p. 6).</p> <p>[69] Waste evolution. An overall reduction of at least -15% (p. 15) is expected, without mentioning a specific deadline.</p>
<p><i>Other indicators indirectly quoted in the document</i></p>	<p><i>p. 11, the White Paper on the future of transport will specify the commitments to reducing greenhouse gas emissions for the transport sector.</i></p> <p>[70] Variation of greenhouse gas emissions produced by the transport sector compared to 1990 levels. It is said that they should be at least -60% for 2050 (p. 4 of the White Paper).<sup>20</sup></p> <p><i>p. 11, the Communication on a 2020 EU Biodiversity Policy and Strategy will set out the commitments in this respect.</i></p> <p>[71] Establishment of the Natura 2000 Network, measured in protected areas under the EU Directives on Birds and Habitats.<sup>21</sup> In 2012 this has to be done (p. 11 of the EU Biodiversity Strategy to 2020).<sup>22</sup></p> <p>[72] Improvement in the status of protection of the Natura 2000 Network, measured in percentage of habitat and species assessments of the protected areas (p. 11 of the EU Biodiversity Strategy to 2020).</p> <p><i>p. 15, “full implementation of existing EU waste legislation”.<sup>23</sup></i></p> <p>[73] Preparing for re-use and the recycling of waste materials such as at least paper, metal, plastic and glass from households and possibly from other origins as far as these waste streams are similar to waste from households. The target is “minimum of overall 50 % by weight”, compulsory by the Directive 2008/98/EC, art. 11.2.a.</p> <p>[74] Preparing for re-use, recycling and other material recovery, including backfilling operations using waste to substitute other materials, of non-hazardous construction and demolition waste excluding naturally occurring material defined in category 17 05 04 in the list of waste. The target is “minimum of 70 % by weight”, compulsory by the Directive 2008/98/EC, art. 11.2.b.</p>

19 This is confirmed in the specific Energy Efficiency Plan 2011 – COM(2011) 109 final. This Plan was already predicted by the Resource-efficient Europe Flagship (p. 11).

20 Roadmap to a Single European Transport Area – Towards a Competitive and Resource Efficient Transport System – COM(2011) 144 final.

21 This constitutes a commonly used indicator, widely used by the EEA and in ESPON Projects such as ESPON 2006 2.4.1 on environmental policies and 1.3.2 on natural heritage. For the EEA use of this indicator, see: <<http://www.eea.europa.eu/data-and-maps/data/natura-1>> (Access 2011-11-4).

22 Our Life Insurance, Our Natural Capital: an EU Biodiversity Strategy to 2020 – COM(2011) 244 end.

23 Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives.

### **3.8. The Flagship “An Integrated Industrial Policy for the Globalisation Era” – COM(2010) 614 Final**

This flagship is basically devoted to improving the business environment, notably for SMEs, and to support the development of a strong and sustainable industrial base able to compete globally. Bearing in mind that “Europe needs industry” (p. 3), it is assumed that European manufacturing will be able to compete with China, Brazil and other emerging countries if investing properly in technology and ICT. The current economic crisis is understood as a “temporary collapse” (p. 3) but indeed it is hoped that manufacturing “can provide the resources and many of the solutions for the societal challenges facing the EU” (p. 4). The central concepts of the flagship are competitiveness and innovation, although its subtitle says “Putting Competitiveness and Sustainability at Centre Stage”; eventually, the initiative deals more with competitiveness than with sustainability, leaving the second point for other flagships.

The first strategies that are quoted for achieving flagship targets are the simplification of bureaucracy and legislation (“smart regulation”), and the availability of the financing needs for companies. In addition the strengthening of the single market is understood as important, including measures for a common EU system of intellectual property rights, liberalisation and standardisation. Moreover the Union wants to establish an international market access strategy for EU companies, avoiding any temptation of protectionist measures against emerging economies (p. 16).

In terms of innovation, several references are made to the Innovation Union Flagship. It is acknowledged that for industry “Europe is not good enough at turning its excellence in ideas into marketable goods and services” (p. 12). In other words, “Europe has a leading position in scientific research” but this is not translated to the industry, including SMEs. This leads to “an urgent need for better coordination of education, R&D and innovation” (p. 12). From the “Innovation Union” Flagship the initiative of the EC for launching a specific innovation partnership for the industry related with ageing (p. 26) is extracted. Not only is the “Innovation Union” Flagship extensively quoted, but also “An Agenda for New Skills and Jobs” and “Resource-efficient Europe”, seen here substantial for European industry.

Although the EC admits that “all sectors are important” (p. 23), this Flagship contains sector-specific initiatives for the following industries, basically seeking to promote innovation:

- Space manufacturing industry, including for instance all related to the Galileo initiative.

- Motor vehicles and transport equipment given that they are related to sustainable mobility, basically clean and energy-efficient vehicles, but also industries devoted to railways (quoting specifically the high-speed train), aeroplanes and maritime transport.
- Those sectors “promising” in meeting the future societal challenges of climate change, health and security: healthcare and pharmaceutical, environmental technologies (including bio-based materials), construction sector and security industries.
- Those sectors where value-chain considerations are particularly important, for instance chemicals (where the EU is a world leader), agro-food, textile, clothing and leather industries, and cultural and creative industries.
- Energy-intensive sectors exposed to international competition as they should succeed in the transition towards a low-carbon and resource-efficient economy.

This flagship is not particularly prodigal with indicators, as it is basically very qualitative orientated. However, some of them are directly or indirectly quoted (see Table 7). In addition, there is a direct mention of the need to monitor competitiveness performance and industrial policies, following the EU decisions on the need to monitor economic trends stated by the EU200S itself and also other communications<sup>24</sup> (pp. 31, 32). This flagship contains a specific set of four indicators to do so (see Table 7).

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24 For instance, Reinforcing Economic Policy Coordination – COM(2010) 250 final.

**Table 7 Indicators Considered in the Flagship “An Integrated Industrial Policy for the Globalisation Era”**

<i>“Headline target” of the EU2020S</i>	[2] % of GDP invested in R&D. Indeed it is not directly quoted, but it is assumed in the flagship that the EU performs in R&D but this R&D success is not translated into real innovation applied in industries (p. 13).
<i>Indicators directly quoted in the document related to how to monitor progress in competitiveness (p. 32)</i>	<p>[75] Improvement in competitiveness, comparing the productivity and cost developments. In the document that is proposed for the whole of the EU in relation to its competitors, but apparently should be developed on other scales.</p> <p>[76] Number of new jobs created in industry and industry-related services.</p> <p>[77] Number of new jobs created in industry and industry-related services created in SMEs.</p> <p>[78] Rate at which manufacturing output rises.</p> <p>[79] Rate at which manufacturing output in the eco-industries rises.</p> <p>[80] Share of medium- and high-technology manufacturing sectors in total manufacturing value-added.</p> <p>[81] Share of medium- and high-technology manufacturing sectors in total manufacturing employment.</p>
<i>Other indicators indirectly quoted in the document</i>	<p>[82] Percentage of GDP of manufacturing sector in total GDP. This seems to be useful to account for the first basic idea of the flagship: “Europe needs industry”.</p> <p>[83] Industrial production. The same rationale as for the previous indicator and, if there is a variation among a period of time on this, it is the same indicator as [78].</p> <p>[84] Percentage of industrial employment in total employment. The same rationale as for the previous indicator and similar to indicator [76].</p> <p>[85] Innovation performance, that is, percentage of R&amp;D transferred into innovation. Seen as very important indicator as noted above (p. 13).</p> <p>[86] Percentage of manufacturing companies with voluntary certified environmental management practices (schemes EMAS and ISO14001). Perceived as important for measuring achievement in a sustainable industrial policy (p. 20).</p>

### **3.9. The Flagship “An Agenda for New Skills and Jobs” – COM(2010) 682 Final**

The flagship begins by stating that the EU2020S’ headline target on employment “will be no easy task”, and in this respect “[a] skilled workforce is an essential asset” (p. 2). The correlation between better skilled workforce and employment is clear from the very title of the flagship: it is “An Agenda for New Skills and Jobs” that constitutes “A European Contribution towards Full Employment”. In order to achieve a skilled workforce together with the headline target on employment, four big strategies are proposed, as follows:

- Better functioning of labour markets through flexicurity policies, which include four principles: “flexible and reliable contractual arrangements, active labour market policies, life-long learning, and modern social security systems” (p. 4). An EC Communication on a new momentum for flexicurity is expected for 2012 (p. 7). In addition, some measures about the need to develop the right mix of skills at the European scale are proposed, leading to the need for cooperation in Vocational Education and Training, including upper



secondary education and tertiary level, which has been object of a specific recent communication.<sup>25</sup>

- Measures related to obtaining a more skilled workforce, including specific actions in the following directions:
  - Increasing the availability of highly-qualified workforce.
  - Predicting which skills are needed for the future and coping with them.
  - Reducing school drop-outs. In this point it must be said that there is a specific Communication of the EC on “tackling early school leaving”, understood to be “a key contribution to the EU2020S Agenda”.<sup>26</sup>
  - Increasing completion of tertiary or equivalent education.
  - Enhancing geographical mobility throughout the EU.
  - Reaping the potential of migration, especially avoiding “the ‘brain-waste’ of highly educated migrants employed in low-skilled or low-quality jobs” (p. 12).

Some of these measures were anticipated in the previous specific EC Communication on new skills,<sup>27</sup> basically devoted to the necessity of upgrading and matching skills in labour terms.

- Better job quality and working conditions, including a long-term strategic approach to improve quality of work and health and safety at work.
- Stronger policies to promote job creation and demand for labour, including specific measures for long-term unemployment and to promote entrepreneurship and self-employment. Entrepreneurship is seen as substantial, but it is not said how to measure it. Here a connection is made with other flagships such as “Innovation Union” and “Industrial Policy for the Globalisation Era” (see sections 3.4 and 3.8).

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25 A New Impetus for European Cooperation in Vocational Education and Training to Support the Europe 2020 Strategy – COM(2010) 296 final. This Communication states that Vocational Education and Training (VET) constitutes “an attractive learning option with high relevance to labour market needs and pathways to higher education” (p. 3). Most of the points of the Communication are devoted to increasing attractiveness, innovation and excellence and achieving mobility at the EU scale, for instance through exchanges and training placements (for instance, by means of the Leonardo da Vinci Programme).

26 Tackling Early School Leaving: A Key Contribution to the Europe 2020 Agenda – COM(2011) 18 final. This Communication basically makes a diagnosis of the causes of factors contributing to this issue and provides systematic evidence-based policies based on a benchmarking of ‘best practices’ in some member states.

27 New Skills for New Jobs. Anticipating and Matching Labour Market and Skills Needs – COM(2008) 868 end.

Finally, the flagship states the need to put the already existing financial tools, especially the ESF, but also the European Regional Development Fund (ERDF) and the Rural Development Fund (EARDF), at the service of these measures for achieving improvement in new skills and jobs.

**Table 8 Indicators Considered in the Flagship “An Agenda for New Skills and Jobs”**

<p><i>“Headline targets” of the EU2020S</i></p>	<p>[1] Employment rate of the population aged 20-64 (working age population) at least 75%. It is acknowledged that currently this rate is 69% and that means that for achieving the target for 2020 will require an average employment growth slightly above 1% per annum (p. 2).</p> <p>[2] % of GDP invested in R&amp;D. It is said that the target is 3%.</p> <p>[6] Drop out rate of early school leavers to less than 10%.</p> <p>[7] Share of population aged 30-34 having completed tertiary education to more than 40%. In the COM(2008) 868 endit is said that “the proportion of jobs requiring high levels of education attainment should rise from 25.1% to 31.3% of the total” (p. 7).</p>
<p><i>Other indicators directly or indirectly quoted</i></p>	<p>[87] Staff working in public employment services. Its growth is qualified as positive (p. 4).</p> <p>[25] Unemployment rate for young people (up to 25 years). It is described as rapidly increasing, in comparison with the unemployment rate of adults, which grows, but not as much (p. 4).</p> <p>[88] Job losses for workers in temporary work. “[A]lmost four times higher than for those in permanent employment” (p. 4).</p> <p>[89] Unemployment among migrant population (non-nationals). It is said that it has sharply risen (p. 4).</p> <p>[90] Percentage of highly-qualified workforce in relation to total workforce. It is assumed that it will increase and that the serious deficits in this sense are “hampering Europe’s sustainable growth objectives” (p. 9). In the COM(2008) 868 final the idea that that there is an increasing job demand for this type of workforce is developed (pp. 7-9).</p> <p>[61] E-skilled jobs in percentage of total jobs. The flagship quotes on p. 9 that these data are previously defined in another Communication of the EC<sup>28</sup> as “ICT-related skills”, that is “people using ICT at work” (p. 3, COM(2007) 496).</p> <p>[62] ICT practitioners, understood in COM(2007) 496 as people working in the ICT sector (pp. 3-4, COM(2007) 496). It is assumed in the flagship that there will be a shortage of them in 2015 (p. 9). In COM(2007) 496 it is added that there is a “decline of supply of highly-skilled ICT practitioners” (pp. 4-5, COM(2007) 496).</p> <p>[59] Percentage of people who do not use the Internet. It is assumed to be very bad in searching for jobs (p. 9). It is defined as “digital illiteracy”, especially affecting elderly, less-educated persons or SMEs employees (p. 10). In COM(2007) 496 it was measured as 37% of the EU population (p. 6, COM(2007) 496).</p> <p>[91] Professionals in health sector. It is said that there will be a shortage of about 1 million professionals (p. 9).</p> <p>[41] Number of researchers. “An additional 1 million researchers are needed to meet our ambitions to establish an Innovation Union” (p. 9).</p> <p>[35] Percentage of adults participating in lifelong learning. The objective of the European Council is 15%, as it is said in the doc. 9845/09 (p. 10).</p> <p>[92] Percentage of workers in involuntary temporary work. It has increased from 53.7% in 2001 to 60.3% in 2009 and this is seen as “bad news on job quality” (p. 14).</p> <p>[93] Percentage of workers in part-time work. It has increased from 18% in 2001 to 25.6% in 2009 and this is seen as “bad news on job quality” (p. 14).</p> <p>[94] Percentage of in-work poverty or “working-poor” of the working population,</p>

	<p>that is, “employed people living under the poverty threshold”. It is currently around 8%, a similar figure to that of 2005 (p. 14).</p> <p>[95] Undeclared work, which makes workers “unprotected and vulnerable” (p. 14). It is said that this “continues to expand and increasingly gains a cross-border dimension” (p. 15). However, this is obviously very difficult to measure.</p> <p>[96] Percentage of businesses which are small and medium-size enterprises (SMEs). It is 99% in the EU (p. 17).</p> <p>[97] Percentage of self-employment. It is 15% in the EU and this is considered to be negative, including the point that “even in periods of economic prosperity their numbers have not increased substantially”; it is seen as an “essential mean to increasing employment rates” (p. 17).</p> <p>[67] Vocational Education and Training (VET) students. This is not directly quoted in the flagship, but in one of its related EC Communications, which is understood to be actively contributing to the achievement of the EU2020S: COM(2010) 296 final. This Communication states that VET positively contributes to the improvement of skill needs in jobs.</p>
<p><i>Demographic trends related with employment issues</i></p>	<p>[98] Fertility rate. It is assumed that declining fertility rates will inevitably mean a shrinking working age population (p. 2).</p> <p>[99] Immigration rate. It is assumed that is substantial for maintaining a working age population (p. 2), as “without net migration, the working-age population would shrink by 12% in 2030” (p. 9).</p> <p>[12] Ageing. It is indirectly quoted, for instance when acknowledging that ancillary healthcare professions will be needed –2 million professional shortages predicted for 2020 (p. 9)– because of the increasing percentage of elderly population.</p>

### 3.10 The Flagship “The European Platform against Poverty and Social Exclusion” – COM(2010) 758 Final

This initiative deals with combating poverty, setting “a dynamic framework for action to ensure social and territorial cohesion such that the benefits of growth and jobs are widely shared across the European Union and people experiencing poverty and social exclusion are enabled to live in dignity and take an active part in society” (p. 3). The link between social and territorial cohesion is verbalised in the very beginning of the initiative, but eventually territorial contents are almost omitted in the document. The Communication is accompanied by a Staff Working Paper that contains a systematic list of key initiatives that are foreseen to be developed in order to attain the flagship.<sup>29</sup> While these initiatives are in the main document itself, in the list they are explained briefly and committed to a deadline.

This is the only flagship that begins by identifying what is understood by “poor” and, in addition, gives the basic data on poverty for the EU and the different countries. In this respect, it is acknowledged that poverty has to be measured through three main indicators, as expressed in Table 9. This

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29 Commission Staff Working Paper List of Key Initiatives Accompanying Document to the Communication [...] The European Platform against Poverty and Social Exclusion – SEC(2010) 1564 final.

initial exposition of data is focused on specific social groups having more difficulties (age and gender differences, homelessness, migrants, etc.).

The areas identified by the EC to act for achieving the aim of the flagship are as follows:

- Delivering actions to fight poverty and exclusion across the policy spectrum. This includes the link to the employment policy (quoting the Agenda for New Skills and Jobs initiative), but also some considerations on essential services of social protection (pensions, health, etc.), integration of third-country migrants, education and training. Some specific measures of antidiscrimination and social exclusion are established for Roma people, people with mental health problems, people with disabilities or homelessness.
- Greater and more effective use of the EU funds to support social inclusion by a review of the EU budget that is being carried out within the framework of the process of implementation of the EU2020S. It is said that the ESF and the ERDF are substantial for achieving results targeted in this Platform; also those devoted to agriculture, rural areas and fisheries are taken into account. In this section the cohesion policy is quoted, through the 5<sup>th</sup> Cohesion Report, as a way to deliver the objectives considered in the Platform.
- Promoting evidence-based social innovation. It is proposed to put into practice the 'social experimentation', which consists of "small scale projects designed to test policy innovations (or reforms) before adopting them more widely". In this respect a European initiative on social innovation is forecasted.
- Working in partnership among public governments at different levels (EU, national, regional and local) and social partners, including social partners. In addition, the EC is keen to support the development of the social economy: volunteering, foundations, social enterprise sector, etc.
- Enhanced policy coordination among the member states. It is established that the Annual Growth Survey has to consider social indicators. Due to the EC assessing progress achieved by the member states on the EU2020S in each Annual Growth Survey, it will be clear if the Platform is being properly put into practice. It is also a commitment of the EC to review the application of the Platform for 2014

**Table 9 Indicators Considered in the Flagship “The European Platform against Poverty and Social Exclusion”**

<p><i>“Headline targets” of the EU2020S</i></p>	<p>[1] Employment rate of the population aged 20-64.</p> <p>[6] Drop out rate of early school leavers.</p> <p>[8] Variation of people living below the respective national poverty lines. In the flagship it is manifested that the EU “should lift at least 20 million people out of poverty and social exclusion in the next decade”, taking into account that “16.5 per cent of our population” is below the poverty line (p. 2), a statement that links indicators [8] and [19]. [8] is a variation between years, while [19] is a percentage in a specific year.</p>
<p><i>The three indicators “defining” the headline target [8] (p. 3)</i></p>	<p>[19] At-risk-of-poverty rate. “The at-risk-of-poverty rate also reflects the definition of poverty adopted by the EC in 1975 who defined the ‘poor’ as ‘those individuals or households whose resources are so low as to exclude them from the minimum acceptable way of life in the country where they live’. The risk of poverty threshold is set at 60% of the national median equivalised disposable income (after social transfers)” (p. 21). Calculations by European Union Statistics on Income and Living Conditions (EU-SILC).<sup>30</sup></p> <p>[20] Index of material deprivation. “People are considered ‘materially deprived’ if they experience at least 4 out of 9 deprivations: people cannot afford i) to pay their rent or utility bills, ii) keep their home adequately warm, iii) face unexpected expenses, iv) eat meat, fish, or a protein equivalent every second day, v) a week of holiday away from home once a year, vi) a car, vii) a washing machine, viii) a colour tv or ix) a telephone.” (p. 22). The average in Europe is 8%, although the rate is more than 30% in some countries (p. 2). Calculations by EU-SILC.</p> <p>[21] Percentage of households with very low work intensity. “[P]eople aged 0-59 living in households where the adults work less than 20% of their total work potential during the past year” (p. 22). Calculations by EU-SILC.</p>
<p><i>Other indicators directly quoted</i></p>	<p>[94] Percentage of “working-poor” of the working population. It is said that it represents 8% (p. 2). The number of individuals affected by in-work poverty “has increased as a consequence of the rise in temporary and part-time work (including involuntary part-time work), coupled at times with stagnating wages” (p. 4).</p> <p>[100] Percentage of risk of poverty for the unemployed population. It is said that it has risen from 39 to 44% from 2005 to 2010 (p. 2). And it is 44%, while for those who have a job it is 8% (p. 4).</p> <p>[101] Percentage of working age population in households where nobody works. The overall figure is over 9% (p. 2).</p> <p>[102] Women at risk of poverty. “The gender divide is clearly visible and women are generally more at risk than men” (p. 4).</p> <p>[103] Children at risk of poverty. The current figure is over 20 million children (p. 4).</p> <p>[104] Young at risk of poverty. The current figure is over 20% of young people (p. 4).</p> <p>[105] Elderly at risk of poverty. The percentage is also above the general percentage (p. 5).</p> <p>[89] Unemployment among migrant population (non-nationals). It is said that it leads to increasing levels of poverty for migrants (p. 5).</p> <p>[12] Ageing. “[T]he rapid ageing of Europe’s population is having wide-ranging impacts on all types of pension schemes and gives unprecedented urgency to the agenda for reforms” (p. 7).</p> <p>[106] Percentage of children between 4 years old and the beginning of compulsory education participating in early childhood education and care. It is benchmarked that the percentage should be 95% and this percentage has been agreed by</p>

30 <[http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/eu\\_silc](http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/eu_silc)> (Access 2011-11-4).

	<p>member states of the EU (p. 8).</p> <p>[59] Digital illiteracy, considered to be people who do not have regular Internet use. It is said that recent data are available in a report from the EC.<sup>31</sup></p> <p>[107] Volunteers. It is a key indicator to value "growth of the social economy" (p. 17).</p> <p>[108] Percentage of the social enterprise sector in the total business. It is said it represents 10% (p. 17).</p> <p>[109] Long term unemployment. It is quoted as one of the groups targeted by the ESF funds (p. 12). In this respect, it is acknowledged that ESF funds will be adjusted to the new framework of the EU2020S.</p>
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### **3.11 The Communication "Regional Policy Contributing to Smart Growth in Europe 2020" – COM(2010) 553 Final**

This Communication is basically developed in order to translate the principles of the flagship initiative Innovation Union (see section 3.4) to the arena of regional policies. The document begins by highlighting that the geography of innovation is uneven, with strong differences between regions that are presented through maps and indicators, aggregated (i.e. regional innovation performance index) and simple (i.e. R&D expenditure). In relation to the latter, it is said that "only 27 regions in the EU, around one in ten have reached that target [R&D expenditure of 3% of GDP]" (p. 4). Dissimilarities are not only in this regard, but also in the allocated percentage of expenditure of Cohesion Policy Funding for innovation, with regions that are focusing on this field and others that are avoiding it.

The communication then turns to foster each region developing its own "smart specialisation strategy" as a mechanism to adopt the EU2020S at the regional scale, and including how the available funds (especially ERDF) might be invested in this respect, even "redirecting funding" (p. 11). This strategy for each individual region should be focus on:

- Innovation clusters (geographic concentrations of companies) for regional growth, providing a favourable environment to promote competitiveness and innovation.
- Innovation-friendly business environments for SMEs, especially those intensive in R&D terms.
- Lifelong learning in research and innovation, especially through a direct involvement of universities. Other flagships "Youth on the Move" (see section 3.6) and "An Agenda for New Skills and Jobs" (see section 3.9) are quoted here in this respect.

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<sup>31</sup> <[http://ec.europa.eu/information\\_society/eeurope/i2010/docs/eda/social\\_impact\\_of\\_ict.pdf](http://ec.europa.eu/information_society/eeurope/i2010/docs/eda/social_impact_of_ict.pdf)> (Access 2011-11-8).

- Attractive regional research infrastructure and centres of competence by means of a three-pronged approach based on:
  - Developing world-class research and ICT infrastructure.
  - Establishing networks of research facilities for less research-intensive countries.
  - Developing regional partner facilities.
- Creativity and cultural industries. It is said that the industrial base is important to recover from the crisis, but also the creativity and skills of people.
- Digital agenda, especially broadband development. It is said that rural regions still experience gaps in this respect.
- Public procurement.
- Addressing the grand challenges through European Innovation Partnerships, especially climate change, energy and resource efficiency, raw material scarcity and demographic ageing.

These strategies are going to be encouraged by the EC through the Smart Specialisation Platform, forecasted for 2012 (p. 13). Some additional actions are proposed at the end of the document, partially taking into account how to make the use of EU funding for the development of these strategies to be passed for each individual region. For instance, it is expected that regions concentrate resources on the most promising areas of comparative advantage ("smart specialisation"), such as clusters, eco-innovation or specific research areas, and develop mechanisms in order to reinforce these areas.

### **3.12 The Communication "Regional Policy Contributing to Sustainable Growth in Europe 2020" – COM(2011) 17 Final**

This Communication sets out the role for Regional Policy in contributing to the implementation of the EU2020S, particularly the flagship "Resource-efficient Europe", acknowledging that it is delivered in the middle of the cohesion funds' 2007-13 programming period, but urging "to act without delay, invest more in sustainable growth, and use funds more effectively" (p. 2). This Communication is also accompanied by a Staff Working Document,<sup>32</sup> which basically essays to systematise examples of good practices in the implementation of the sustainable growth objectives of the

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32 Commission Staff Working Document of Regional Policy Contributing to Sustainable Growth in Europe 2020 – SEC(2011) 92 final.

EU2020S in different regions of the EU, and that is going to be reflected as well in this section (see below).

The Communication begins by stating that in 2007 objectives related to an efficient use of resource were not priorities. However, with the flagship "Resource-efficient Europe" and the EU2020S framework this situation has changed. In this respect, the EC "believes that within the current programming period there is considerable scope for the managing authorities to deploy available resource more effectively" (p. 5); among these authorities, decisions will fall at local and regional level. This is why the Communication is devoted to recommending "how priorities for investment can be selected and how they can be best managed to obtain maximum results in terms of sustainable growth" (p. 5). Two pillars are established to do so:

- Investing more in sustainable growth: encouraging greater strategic focus on investments in sustainable growth with an emphasis on the following directions:
  - Transition to a low-carbon economy. The main area is energy investments in buildings, taking into account that traditionally this has been for public buildings and "it is now possible to use these funds in the residential sector in all Member States" (p. 6). The need to accelerate investments in renewable energies is also mentioned; this will contribute to achieving headline target [4] through the development of clean urban public transport, namely railways.
  - Ecosystem services and protection of biodiversity. It is said that biodiversity should be a key focus of interest, including: natural capital, natural risk prevention and green infrastructure and ecological networks. That leads to the need to work in ecosystems restoration (including flood plains) and implement parks, eco-corridors and other natural or semi-natural features. These investments are supposed to be developed "in particular where Natura 2000 areas are likely to be affected" (p. 8). It has to be said that protected areas are supposed to be critical for the implementation of this Communication as they can receive specific funds under the "protection of biodiversity" target for adjusting the Regional Policy in relation to the EU2020S (p. 8), and the adjustment of funds such as those from Rural Development Policy, LIFE+ or the 7<sup>th</sup> R&D Framework Programme might be directed to "ecosystem services, in particular protection of biodiversity" (p. 14).



- Eco-innovation by means of developing the eco-industry sector, developing clusters in green technology or promoting ICT for green economy. One of the possible tools in this respect is working through the European Social Fund in the development of skills in eco-innovation.
- Investing better in sustainable growth, which is based in two set of tools:
  - Administrative and policy-making issues, that is: better governance, including sustainable development considerations in each planning and project life-cycle step, taking into consideration the climate change and resource-saving effects that each decision can bring, and making use of green public procurement. For instance, it is stated that measures on waste prevention, or in reuse and recycling, should be systematically beared in mind when developing plans at the local and regional scales. The macro regional level, at least for the Baltic Sea Region and the Danube Space,<sup>33</sup> is also quoted in better governance, and also the involvement of NGOs in the adoption of climate change mitigation strategies.
  - The development of proper indicators for monitoring and evaluation. It is acknowledged that EUROSTAT is developing sustainable development indicators, but there is still more scope in this sense.

As has been mentioned above, the Commission Staff Working Document of Regional Policy Contributing to Sustainable Growth in Europe 2020 (SEC(2011) 92 final) is a parallel document to the Communication COM(2011) 17 final which basically supports "with additional analysis and practical ways forward as well as a range of good practice examples along the priorities highlighted in the Communication" (p. 2, SEC(2011) 92 final). The pillars mentioned above, with the specific actions included in each pillar, are detailed and explained including the job effects that each one of the measures could bring. In relation to some particular issues, this document SEC(2011) 92 contains cartography for NUTS2 regions, for instance the climate change vulnerability index, derived from a previous Staff Working Document known as "Regions 2020" (see section 3.13), that was framed before the EU2020S. Also data on the cohesion policy funding for environment is shown, noting that approximately 30% of the

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33 European Union Strategy for the Baltic Sea Region – COM(2009) 248 Final; European Union Strategy for Danube Region – COM(2010) 715 Final.

€344 billion Regional funding for 2007-2013 is available for activities with a particular impact on sustainable growth.

It has to be said that some of the measures contained in the Staff Working Document (SWD) are widened in relation to the Communication, in the sense that the former is more detailed than the latter. For instance, with regard to low-carbon economy, the SWD considers that energy efficiency investments can be provided for buildings, as the Communication did, but also for renewable energies and clean transport. Another example can be quoted in relation to Natura 2000; in the SWD it is said that in Natura 2000 protected areas "managing authorities should further invest in the maintenance, creation or re-development of ecological networks and corridors" (p. 18); in addition, it is stated that "the management and/or development of protected areas in regions needs to be placed within the context of 'ecosystem services'" (p. 19). For each particular section, the applicable EC Communications are quoted, and also available funds and benchmarks from several EU regions. The SWD finishes by stating again that the documents COM(2011) 17 and SEC(2011) 92 have two basic aims:

- Encouraging an optimal use of and, if justified, a reallocation of regional funds so that they meet the resource efficiency objectives of the EU2020S.
- Encouraging the managing authorities to use the remaining years of the current programming period to "prepare the ground for EU regional policy funds to play a major role in sustainable growth and resource efficiency", predicting new strategic fields of action for the next programming period.

### **3.13 The Staff Working Document "Regions 2020. An Assessment of Future Challenges for EU Regions" – SEC(2008)**

Previous to the documents officially translating the EU2020S principles into Regional Policy (analysed in previous sections 3.11 and 3.12), there was already an EC Staff Working Document (SWD) examining how the Regional Policy is adapted to challenges due to the global financial and economic turbulences. Indeed this document was launched in 2008, when allegedly turbulences were still not a crisis, and when obviously the EU2020S was not in force. Basically, this SWD is focused on four broad challenges identified, considered to be "of particular relevance for European regions" (p. 3):

- Globalisation, comprising not only of the opening up of new markets, but also the transformation to a knowledge and service economy.
- Demographic change, which will result in an age and employment structure transformation.
- Climate change that is impacting in Europe's environment and society.
- Energy and need to move towards a low-carbon economy in Europe.

These main points are understood to be substantial "in the medium-term perspective of 2020" (p. 4) and at least three of them are very consistent with the topics contained in the EU2020S. The SWD basically "seeks to illustrate which regions are most vulnerable to these challenges, as a step towards a better understanding of the potential pattern of regional disparities that these challenges will generate" (p. 4).

In the case of globalisation, a globalisation vulnerability index is calculated for 2020,<sup>34</sup> basically combining estimated labour productivity growth, employment rate and education (both in high and low education rate). The resulting map shows evident differences across the EU. In addition, metropolitan and urban regions seem to be better prepared for globalisation than the most rural ones. Apart from that, it is said that higher productivity rates benefit a proper globalisation insertion, while regions lacking the capacity to develop a knowledge-based economy are likely to become more exposed to globalisation. Also low employment levels are coined as negative in this respect. Correlations in this point and in the rest of the document are based on a matrix which is presented on pp. 42-43.

In the case of demography, also a vulnerability index (for 2020, calculated combining people aged 65 and over, share of working age and population decline in 2020) is developed and mapped for NUTS2 regions.<sup>35</sup> Moreover the resulting geographical pattern is reported. There is a correlation between regions experiencing ageing and those with high unemployment, mainly rural areas. The opposite situation affects metropolitan and coastal areas.

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34 The pattern is explained on p. 6. Methodological notes on p. 44. In a later report contracted by DG REGIO a new estimation on globalisation vulnerability for EU regions is made; see ISMERI EUROPA (2009).

35 The pattern is explained on p. 10. Methodological notes on p. 44. In a later report contracted by DG REGIO a new estimation on demographic change vulnerability for EU regions is made; see ISMERI EUROPA (2009).

In the case of climate change, several negative consequences are forecasted. However, it is recognised that there is a considerable effort in tackling the growth in greenhouse gas emissions to adapt to the consequences of climate change. In this section a climate change vulnerability index has also been calculated,<sup>36</sup> combining physical and economic effects that are forecasted for 2020 (specifically, “population affected by river floods, population in coastal areas below 5 m, potential drought hazard, vulnerability of agriculture, fisheries and tourism, taking into account temperature and precipitation changes”, as reported in p. 13). Effects are likely to affect more South and East of Europe and more limited pressures are expected in Northern and Western Europe, apart from lowland coastal regions. It is mentioned that “pressures from climate change [...] will be felt in regions with low GDP per capita, which thus have a lower capacity for adaptation to climate change” (p. 12). It is concluded that the expected effects are serious and that in this respect “[a]daptation to climate change is of vital importance” (p. 14).

In the case of energy, an energy vulnerability index is calculated as well,<sup>37</sup> combining three groups of elements: internal and external security of supply, energy use and efficiency (which determinates vulnerability to high price levels) and carbon emissions. The pattern of this indicator is very uneven and depends basically on the national contexts, rather than on regional circumstances. For concluding the SWD, a combined map of the number of challenges is developed on p. 19.<sup>38</sup> The Southern areas of the EU are considered to be in a worse situation than their counterparts on the Northern side. Finally, the Annex of the SWD is a list of all the maps that constitute the basis of the different vulnerability indexes developed.

### **3.14 The Treaty on European Union and the Treaty on the Functioning of the European Union**

As a precedent, the Treaty establishing the European Economic Community signed in Rome in 1958 can be considered equivalent to the

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36 The pattern is explained on p. 12. Methodological notes on p. 44. In a later report contracted by DG REGIO a new estimation on climate change vulnerability for EU regions is made; see ISMERI EUROPA (2009).

37 The pattern is explained on p. 15. Methodological notes on p. 45. In a later report contracted by DG REGIO a new estimation on energy risks vulnerability for EU regions is made; see ISMERI EUROPA (2009).

38 In this case the index seems to be quite simplistic, just representing the accumulation of the number of challenges (ranging from 0 to 4), see p. 19. However, in the case of ISMERI EUROPA (2009), which is thematically very consistent with this SWD being analysed in section 13, there is no such aggregate index. It has to be mentioned that ISMERI EUROPA (2009) adds a fifth thematic challenge for estimating vulnerability based on social risks (poverty, job instability, failures of welfare systems, etc).

current Treaty on the Functioning of the European Union (TFEU). Since 1958, several reforms have taken place. The last one is the so-called Treaty of Lisbon, signed on 13 December 2007 in the capital of Portugal. In 2010 a consolidated version of the Treaty was officially published, together with the consolidated version of the Treaty on European Union (TEU).<sup>39</sup>

After the ratification of the Lisbon Treaty, art. 3 of the TEU now reads: “[the Union] shall promote economic, social and territorial cohesion, and solidarity among Member States”, whereas art. 2 of the TFEU provides that “Shared competence between the Union and the Member States applies in [...] economic, social and territorial cohesion”. This is the general framework of the Title XVIII of the TFEU, located in Part III (Union policies and internal actions), devoted to economic, social and territorial cohesion, which is formed by the Articles 174 to 178. It is substantial in the context of an ESPON project to analyse the contents of the articles included in this Title XVIII.

Article 174 establishes that “the Union shall develop and pursue its actions leading to the strengthening of its economic, social and territorial cohesion. In particular, the Union shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions.” This is a very clear statement, claiming that the Union must face the uneven pattern of development that occurs in the EU territory. Apart from this general principle, the same article notes that “particular attention shall be paid to” specific areas understood to deserve individual consideration: “rural areas, areas affected by industrial transition, and regions which suffer from severe and permanent natural or demographic handicaps such as the northernmost regions with very low population density and island, cross-border and mountain regions.” As it is well known, ESPON has developed its own regional typology<sup>40</sup> which partially satisfies these specifications raised by the TFEU.

Article 175 specifies that the Article 174 shall be managed through the policies of the Union and the member states, in particular the consolidated funds that constitute the usual budget “core” of the EU, that is, the Structural Funds constituted by: the European Agricultural Guidance and Guarantee Fund, the European Social Fund (ESF) and the European Regional Development Fund (ERDF). Article 175 also creates the duty for

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39 Official Journal of the European Union, 2010-03-30, 2010/C 83/01.

40 This is available on the ESPON website. See in this respect: <[http://www.espon.eu/main/Menu\\_Projects/Menu\\_ScientificPlatform/typologycompilation.html?currentPage=3](http://www.espon.eu/main/Menu_Projects/Menu_ScientificPlatform/typologycompilation.html?currentPage=3)> (Access 2011-11-25). The maps can be easily downloaded at <<http://database.espon.eu/regional>> (Access 2011-11-25).

the EC to elaborate a report on the state of cohesion in the EU, expressly including territorial cohesion (see sections 3.16 and 3.17).

Article 176 states that the ERDF “help[s] to redress the main regional imbalances in the Union”. In addition, Articles 177 and 178 establish how this fund and the other Structural Funds are delivered in terms of policy-making.

According to Böhme *et al.* (2011: 18), the notion of territorial cohesion that now is a part of the treaties of the EU is not a new issue, but can be dated to late 1980s political discussions. Throughout the 1990s there were several attempts to clarify this question, both from the member states side (i.e. the ESDP in 1999) and the EC (for instance, the reports *Europe 2000* in 1991 or *Europe 2000+* in 1994). It is widely acknowledged as well that the research activity of ESPON has facilitated the theoretical development of this concept. What is substantially new is that the notion is now incorporated in the treaties.

### **3.15 The Communication “Green Paper on Territorial Cohesion. Turning Territorial Diversity into Strength” – COM(2008) 616 Final**

The Communication begins by highlighting the fact that the EU harbours an incredibly rich territorial diversity and that territorial cohesion “is about ensuring the harmonious development of all [the] places [in the EU] and about making sure that their citizens are able to make the most of inherent features of these territories” (p. 3). The concept of territorial cohesion allows an integrated approach bridging economic effectiveness, social cohesion and ecological balance, thus putting sustainable development at the core. Public policies can help territories to make the best use of their assets and also foster cooperation between them. EU structural policies have already worked in these directions. Like all the green papers elaborated by the EC, the basic objective is to open a discussion by stimulating debate and launching a process of consultation at European level. In some cases, Green Papers are followed by White Papers, the latter being documents containing proposals for Community action in a specific area; however, this has not been the case of the territorial cohesion domain; that means that the Green Paper has been the last major policy definition effort in this field raised by the EC. Be that as it may, the Green Paper includes an Annex,<sup>41</sup> basically devoted to showing maps of the considered topics, but also to proposing some

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41 Commission Staff Working Paper Accompanying the Green Paper on Territorial Cohesion... – SEC(2008) 1564 Final

particular definitions for specific issues such as regions typology, in accordance with ESPON developments in this respect (see section 3.14).

The Green Paper considers that there are particular challenges with regard to territorial cohesion based on specific geographical features, as follows:

- Concentration and density. It is concluded that “excessive concentrations of growth” should be avoided, but also “the access to the increasing returns of agglomeration” should be facilitated in all territories (p. 6).
- Connecting territories, which “means more than ensuring good intermodal transport connections” by requiring “adequate access to services such as health care, education and sustainable energy, broadband internet access, reliable connections to energy networks and strong links between business and research centres” (p. 6).
- Cooperation, understood at various levels: inter-administrative cooperation between regions and nations (especially when metropolitan regions cross regional and international borders), but also between the EU and neighbouring countries, and taking into account the maritime spaces as well.
- Regions with specific geographical features, facing particular development challenges and including:
  - Mountain regions.
  - Island regions.
  - The sparsely populated regions.
  - Also the coastal zones and the outermost regions are quoted as regions facing “common challenges” (p. 8), but the three previous groups are highlighted.

The Green Paper finishes by providing some tags of territorial cohesion in the programming of EU policies and in the debate in and among the member states. It is said that it is true that EU structural policies have targeted less favoured policies, but it is unclear if other EC policies have affected territorial cohesion. In particular, some domains like research, environmental policy, maritime policy or competition policy are quoted as significant policy areas that should include a clearer territorial cohesion approach. Spatial planning is also mentioned, but it is said that clearly member states and regional bodies understand that competences over matters concerning land use and development planning are national and regional, but not EU. The Green Paper acknowledges in this respect that “[t]hese issues remain outside the scope of the debate” (p. 10) and quotes that the territorial incumbency of the EU is specified in the

Territorial Agenda as adopted in May 2007 (see section 3.18). Finally, the Green Paper includes a list of questions to debate, as follows:

- A precise definition of territorial cohesion.
- The scale and scope of territorial action, discussing how far the territorial scale of policy intervention should vary according to the nature of the problems addressed.
- Better cooperation, including the role to be developed by the EC or if there is a need for a new territorial cooperation.
- Better coordination between sectoral and territorial policies and coherence between territorial interventions.
- New territorial partnerships, for instance with representatives of the social economy, local stakeholders, voluntary organisations and NGOs.
- Indicators (both qualitative and quantitative) to measure territorial cohesion.

A synthesis of this discussion opened by the list<sup>42</sup> was committed for late Spring 2009. Apparently, this synthesis has not been launched in a consistent document, but in an official EU webpage<sup>43</sup> the results state that we “do not yet have any operational conclusion” for the definition of territorial cohesion. The same webpage considers that there has been a consensus on the fact that territorial dimension needs to be reinforced at all levels and at all stages in policy design and implementation, specifically on the following six “strands”:

- Coordinated public policies at different levels.
- Better account of territorial impacts.
- Improved multi-level governance.
- The need for functional approaches, covering regions, but also considering other geographies where appropriate: river basins, mountain areas, networks of towns, metropolitan areas, deprived neighbourhoods, etc. It is said that this is a matter of flexibility.
- Territorial cooperation as a clear EU asset.
- Reinforced evidence base, acknowledging that a better territorial knowledge is needed.

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42 Contributions are at: <[http://ec.europa.eu/regional\\_policy/archive/consultation/terco/contrib\\_en.htm](http://ec.europa.eu/regional_policy/archive/consultation/terco/contrib_en.htm)> (Access 2012-3-20).

43 <[http://ec.europa.eu/regional\\_policy/archive/consultation/terco/consultation\\_en.htm](http://ec.europa.eu/regional_policy/archive/consultation/terco/consultation_en.htm)> (Access 2012-3-20).



### **3.16 The Fifth Report on Economic, Social and Territorial Cohesion (2010)**

In the EU, a full Cohesion Report is published every three years; in the years in between, a progress report on economic and social cohesion is delivered. The last available former type of report is the Fifth Report on Economic, Social and Territorial Cohesion (quoted further as 5<sup>th</sup> Cohesion Report), published in November 2010 by the EC, which is going to be analysed in this section 3.16. In the meantime, in section 3.17 the last available progress report (from 2011) is going to be explained as well.

The 5<sup>th</sup> Cohesion Report aims to support the EU2020S and highlight that regions and cohesion policy can contribute to the successful development of the EU2020S. In this respect, the 5<sup>th</sup> Cohesion Report clearly acknowledges that the current context is dominated by “the worst financial and economic crisis in recent history” (p. XI), which has to be dealt with through EU policies and by means of an active national and regional participation as well. In addition, the 5<sup>th</sup> Cohesion Report also begins by emphasising that it is the first full cohesion report delivered under the Lisbon Treaty (see section 3.14), meaning that territorial cohesion is added to the previous EU goals of economic and social cohesion. To sum up, the document starts with the idea that Europe needs a policy to help the EU and its regions emerge from the crisis, reduce disparities and contribute to meeting the ambitious objectives of the EU2020S.

The report is divided in four chapters:

- The first deals with the economic, social and territorial situation and trends in the EU by considering:
  - The promotion of economic competitiveness and convergence.
  - The improvement of well-being and the reduction of social exclusion.
  - How to enhance environmental sustainability.
- The second focuses on the contribution of national policies to cohesion.
- The third gives an overview of how EU policies have contributed to cohesion.
- The fourth summarises the evidence on the positive impact of cohesion policy in furthering cohesion and shows the areas in which improvements might be implemented.

**Chapter I** reveals remarkable regional disparities and considers that here is a wide gap between the less developed and the highly developed EU regions. It is said that in order to achieve progress towards the goals of smart, green and inclusive growth (that is, the EU2020S), these regional disparities have to be reduced. Chapter 1 is the longest section of the 5<sup>th</sup> Cohesion Report (approximately, 150 pages of 250) and, importantly, contains a wide collection of maps, using more than 200 indicators (simple and aggregate), frequently mapped at NUTS 2 level for EU27 countries; this effort has been very important for the SIESTA Project. For assessing economic, social and territorial situation and trends three sections are provided: competitiveness, well-being and sustainability.

On competitiveness, considerations about competitiveness, innovation, infrastructure and institutions, among others, are raised. In terms of competitiveness, the 5<sup>th</sup> Cohesion Report explains how belonging to a large single market or free trade zone is not enough to improve the situation of the regions that are less developed. Comparisons are made with the NAFTA area or with Brazil, among other multinational trade zones or big nations in spatial and economic terms. It is said that the main source of growth (measured in GDP per head) in all EU regions has been higher productivity (p. 23). Most of the considerations are made by distributing the regions in convergence, transition and regional competitiveness and employment (RCE), following the objectives of the EU regional policy for the current 2007-2013 funding period. In terms of innovation, the 5<sup>th</sup> Cohesion Report shows the obvious regional imbalances (i.e. only one region in ten has reached the target of investing 3% of GDP in R&D, only one region in six has reached the target of 40% of those aged 30-34 with a tertiary education degree) and suggests that innovation is basic for all regions, even if they are not at the forefront (i.e. absorbing and spreading innovative practice developed elsewhere); if growth depends on productivity, the basic source to improve productivity is innovation (p. 71). In terms of infrastructure, the emphasis is put on digital networks, while importantly it is acknowledged that the capacity of rail, road, air and water transport remains critically important (that is, the traditional transport infrastructure); in the case of infrastructure, an uneven distribution across the EU is also reported. Finally, in terms of institutions, issues such as fiscal consolidation, macro-economic conditions, legislative and regulatory system, the need for sufficient levels of public investment or e-government are quoted. To conclude the considerations on competitiveness, an aggregate competitiveness index is developed, mapping it at NUTS2 level (p. 69).

In relation to improving well-being and reducing exclusion, significant questions are considered, basically structured among three main foci of

interest: life expectancy and health, living conditions and poverty. In all these issues differences between regions are constantly highlighted. In the case of living conditions, unemployment is considered as a particularly critical problem and widely considered; it is also reported that labour mobility in the EU remains low, especially when compared to the US. For poverty, the EU2020S is directly quoted and the indicators that are considered therein (see sections 3.2 and 3.10) are mapped and analysed. Importantly, this section includes a map of the UN human development index for the EU regions.<sup>44</sup>

With regard to environmental sustainability, the substantial issue is climate change, but also environmental quality (waste water treatment, air quality, Natura 2000 network extension, etc.) is reported. In climate change, considerations on temperature shifting, changes in snow cover, water scarcity, forest fires or flood hazards are detailed; an aggregate index on vulnerability of regions to climate change is facilitated on p. 125, following the report "Regions 2020" (see section 3.13). The headline targets of the EU2020S in relation to sustainable growth are quoted but not mapped at the regional scale because of the lack of available statistics at this level. In this respect, it has to be said that indicators and comments on environmental sustainability are mostly based on projections; this fact shows the general lack of data and specific indicators (more prominent at regional level) to analyse territorial diversity on the environment and sustainable growth. Be that as it may, it is constantly repeated that there is a contrast between the South and the North of the EU in terms of environmental sustainability, the former being in a worse situation than the latter.

**Chapter II** systematises the regional development policies implemented by national governments, leading towards endogenous development and delivered through public investments. Most of the analysis in this chapter is done at the member level scale, with scarce regional considerations, except some maps, including a specific one on the estimated public investment per head in pps (2002-2006) (p. 160). Because of the crisis, the governments are facing increasing problems of borrowing, debt, deficit, etc. It is concluded that, in order for investment to lead to a boost in growth, proper institutional governance is critical.

**Chapter III** provides a distinction made between the following types of EU policies:

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44 As it is well known, the UN human development represents a new way of measuring development by combining indicators of life expectancy, educational attainment and income into a composite index, embracing both social and economic development. See <<http://hdr.undp.org/en/statistics/hdi/>> (Access 2012-3-25).

- Those with an explicit spatial (regional) dimension, which means that during the policy design phase the territorial impact is considered and the policy is adjusted to ensure it has the highest impact and a balanced territorial distribution of this impact: competition, transport, environment, maritime and fisheries.
- Those which only have a partial spatial dimension: research and technology, innovation and entrepreneurship, information society and media, poverty and social exclusion, employment, education, gender equality, health, the CAP and climate. It is said in the 5<sup>th</sup> Cohesion Report that they should consider territorial impact more actively.
- Those without spatial dimension, categorised by Böhme *et al.* (2011: 41) as “spatially blind”; they have a clear impact in the territory, but “they do not pursue spatially differentiated objectives”. That means that these policies do not distinguish between different parts of the EU. They include: single market, trade, energy, economic and monetary union and the Lisbon Strategy. On p. 195 the three groups of 2007-2013 regions (convergence, transition and RCE) are ranked in relation to the Lisbon Strategy, an effort which is worthwhile for the SIESTA Project.

This chapter concludes by arguing that “all types of policies, be they spatially blind or spatially targeted, should include a territorial dimension in their ex post assessment which would allow for catching both intended and unintended spatial impacts” (p. 199).

**Chapter IV** deals with the impact of EU cohesion policy. It is justified that cohesion policy is devoted to investing in green, smart and inclusive growth, as they constitute “the main lines of spending” (p. 202). Allegedly, this would make the cohesion policy very consistent with the EU2020S; however, it is unlikely that a policy that was designed before the EU2020S could perfectly fit with a subsequent document. Cohesion funds are distributed among different sections (innovation, transports, financial adjustment, well-being, urban regeneration, environment, etc.) and their regional impact across the EU is assessed. Some room for improvement is seen across this section and, indeed, it is said that major transport investments in EU15 are being made and the vision should shift to more environmentally-friendly investments.

The 5<sup>th</sup> Cohesion Report includes on pp. XXIII-XXXIII a Communication of the EC on the future of cohesion policy.<sup>45</sup> This section of the 5<sup>th</sup> Cohesion

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45 Conclusions of the fifth report on economic, social and territorial cohesion: the future of cohesion policy – COM(2010) 642 final.

Report acknowledges that the cohesion policy has made significant progress in economic and social development of regions, but needs adjustments in order to be consistent with the EU2020S.

“The explicit linkage of cohesion policy and Europe 2020 provides a real opportunity: to continue helping the poorer regions of the EU catch up, to facilitate coordination between EU policies, and to develop cohesion policy into a leading enabler of growth, also in qualitative terms, for the whole of the EU, while addressing societal challenges such as ageing and climate change.” (p. 2).

The first section of the Communication COM(2010) 642 is devoted to the changes needed to be implemented in the cohesion policy:

- Reinforcing strategic programming, for instance by translating the targets and objectives of the EU2020S into investment priorities.
- Increasing thematic concentration, for instance by linking to the flagship initiatives of the EU2020S.
- Strengthening performance through conditionality and incentives for instance by means of macro-economic reforms.
- Improving evaluation, performance and results, for instance by setting measurable targets and outcome indicators.
- Supporting use of new financial instruments, for instance combining grants and loans.

The second section of the Communication COM(2010) 642 reports that a particular emphasis on the role of the following geographical objects has to be addressed:

- Cities. An ambitious EU urban agenda is substantial.
- New scales of reference such as groups of towns or river and sea basins.
- Geographical or demographic specific features, for instance in the outermost regions of northernmost regions with very low population density and island, cross-border and mountain regions, as explicitly recognised by the Lisbon Treaty (see section 3.14).
- Macro-regions.

Section 3 of the Communication COM(2010) 642 is devoted to dealing with the need to simplify the system, by reducing the administrative burden, and to increase accountability and to enhance financial discipline and control.

The last sections of the Communication COM(2010) 642 emphasize the fact that cohesion policies have to be primarily decided on depending on

the level of economic development of the regions (measured by GDP per capita), as usual. However, it has to be ensured that all regions and member states are eligible for cohesion policy, and this will be done through adopting the EU2020S targets as cohesion policy targets (especially by means of the ESF); in this respect, the need to consider a new “intermediate category of regions” (p. XXXIII) is quoted. It is expected that in 2011 discussion will foster a reform of cohesion policy.

### **3.17 The Seventh Progress Report on Economic, Social and Territorial Cohesion (2011)**

The Seventh Progress Report on Economic, Social and Territorial Cohesion (quoted further as 7<sup>th</sup> Cohesion Progress Report) was published in late 2011 by the EC. The 7<sup>th</sup> Cohesion Progress Report is basically devoted to framing the urban and regional dimension of the EU2020S. This direction is consistent with the previous orientation of the 5<sup>th</sup> Cohesion Report (see section 3.16), but also with some legislative proposals for the cohesion policy 2014-2020 which are already available and that highlighted that future cohesion policy has to be focused on the EU2020S contents and targets.<sup>46</sup> What is basically expected is that future cohesion policy constitutes a key delivery mechanism for the EU2020S at the regional and local level and in this respect it is essential to know how the EU2020S can be mapped. Basically, this is done in the 7<sup>th</sup> Cohesion Progress Report through a cartography of the national headline targets (see section 3.3); this effort has been very useful for the SIESTA Project, not only when the 7<sup>th</sup> Cohesion Progress Report maps, but also when this document is not able to map because of data scarcity and eventually substitutes the maps with graphs (usually at member state level). It is also important to note that from the perspective of the SIESTA Project that the analysis provided in this document is not only done at the regional (usually NUTS2) level, but also at the urban scale level, which is quite a novel outcome; the active consideration of the urban dimension is consistent with the indications in this respect already raised by the 5<sup>th</sup> Cohesion Report (see section 3.16) and with the perspectives for the period 2014-2020. “When designing regional growth strategies, cities should play an active role” (p. 17).

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46 Proposal for a Regulation of the European Parliament and of the Council laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund covered by the Common Strategic Framework and laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation (EC) No 1083/2006 – COM(2011) 615 final. In March 2012 this document was amended.

Logically, the report is divided into the same priorities as the EU2020S (see sections 3.1 and 3.2). However, the internal divisions of these priorities into sections show some shifts (in some cases they are not exactly coincident with the flagship initiatives) and they include a specific consideration of the urban scale which is absent in the EU2020S. In this respect, the “obvious” sections derived from the EU2020S are delivered at the regional scale (and are mapped in the Annexes, see below), while the urban scale appears in a specific scale for each pillar, as follows:

- Smart growth, including:
  - Education and training.
  - Research and innovation.
  - Digital society.
  - Creative cities: hubs of innovation.
- Sustainable growth, including:
  - Resource efficient Europe.
  - Sustainable cities.
- Inclusive growth, including:
  - Employment.
  - Poverty and exclusion.
  - Inclusive cities: the urban paradox.

The 7<sup>th</sup> Cohesion Progress Report includes maps and graphs in Annexes 1 to 10. It is important to say that some of the maps are not obviously linked to the main body of the text (and to the EU2020S) but in each case there are the following sections for each Annex:

- Why does it matter?
- How the EU regions score? This includes tables of the regions located in the extreme situations (top and/or down in the table).
- When maps (7 cases),
  - One map showing the regional distribution of the feature.
  - One map showing a trend (change) or the distance to the national EU2020S target.
- When graphs (3 cases), a single static graph or showing distances to the target. In two cases data are at member state level, while in the other it is for metropolitan regions distributed among member states.

Significantly, it is clear from the analysis of the 7<sup>th</sup> Cohesion Progress Report that data for sustainable growth priority is not available at regional level. This illustrates again that, since the publication of the 5<sup>th</sup> Cohesion Report one year before, availability of regional data for this category has not improved very much.

The 7<sup>th</sup> Cohesion Progress Report concludes by suggesting that differences between cities and regions are substantial in relation to the EU2020S and that needs are very different across the EU space in this respect. That leads to the argument that “policies should take these [different] needs into account” (p. 17). The conclusions also report that regional disparities can be shown as follows:

- Convergence regions score poorly on the smart growth and inclusive growth priorities.
- Transition and RCE regions score better on these issues, but it is true that the crisis is especially impacting the RCE regions, namely in terms of employment and competitiveness.
- Sustainable growth challenges are present in all regions.

Importantly, the 7<sup>th</sup> Cohesion Progress Report includes the following statements:

“This analysis does not imply that all the regions can or should reach the national 2020 targets. For some regions, the distance to the target is simply too great. Furthermore, for some issues it is not realistic or desirable that all regions reach the same target. For example, R&D is highly concentrated in part due to benefits of clustering research. The concentration of poverty and exclusion, however, has a lot of negative effects.

“In short, cohesion policy programmes should select their investment priorities taking into account the starting position of a region or city in relation to the national 2020 targets and identify the concentrations to promote and the ones to fight.” (p. 6).

This is determinant. However, it is not clear in the 7<sup>th</sup> Cohesion Progress Report how, if the targets are not applicable everywhere, they will frame the future cohesion policy.



### **3.18 The Territorial Agenda of the European Union 2020 (2011)**

The Territorial Agenda of the European Union 2020 (TA2020)<sup>47</sup> is a strategic document adopted at the Informal Ministerial Meeting of Ministers responsible for Spatial Planning and Territorial Development in May 2011 in Gödöllő (Hungary), based on the former Territorial Agenda of 2007.

Three strategic documents (the Territorial State and Perspectives of the European Union –see below-, the EC’s 5<sup>th</sup> Cohesion Report –see section 3.16– and the Europe 2020 Strategy –see sections 3.1 and 3.2) were taken into consideration to prepare the TA2020 final version. Thus, the TA2020 document points out the need for a change towards an inclusive, smart and sustainable Europe. In this regard the TA2020 aims “to ensure implementation of the Europe 2020 Strategy according to territorial cohesion principles” (p. 4). According to Böhme *et al.* (2011: 14), “Although this document [TA2020] is also designed for a very wide audience, it has received a lower level of public recognition than ‘Europe 2020’ Strategy”. It is true that TA2020 and EU2020S come from different political processes, but there is “however a strong belief that they should be used to reinforce each other” (Böhme *et al.*, 2011: 14).

TA2020 is structured in four chapters distributed specifically in 71 points. They are as follows:

- Territorial cohesion is a common goal.
- Challenges and potentials for territorial development.
- Territorial priorities for the development of the EU.
- Making EU territorial cohesion a reality.

**Chapter I** presents 13 points for a more harmonious and balanced state of Europe. It is said in the document that all policies and decisions of the European Union will contribute to economic, social and territorial cohesion and in this way “design and implementation of sectoral policies should take the principles and objectives of the TA2020 into consideration” (p. 4, point 7). Point 8 reinforces the principle of solidarity to promote convergence between different economies and expresses the idea of “equal opportunities for citizens and enterprises” (p. 4). These principles will be taken into account in relation to fighting against poverty and social inclusion as an EU2020S objective. Finally, in this chapter is possible to

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47 Available at: <<http://www.eu-territorial-agenda.eu/Reference%20Documents/Territorial-Agenda-of-the-European-Union-Agreed-on-25-May-2007.pdf>> (Access 2011-11-11).

find a reference in relation to energy efficiency when the document says that “we are convinced that inclusive, sustainable and efficient use of Europe’s territory and resources is a key element of cohesion” (p. 5, point 13).

**Chapter II** provides an opportunity for more sustainable and resource efficient economic structures after the crisis. The subchapter “Territorially diverse demographic and social challenges, segregation of vulnerable groups” emphasises ageing and depopulation as a new demographic problem in many rural and peripheral European regions. This issue could be linked to lack of employees and opportunities in many peripheral and disadvantaged regions, especially in areas with low accessibility (points 18 and 19). The second part of the chapter deals with matters with references to climate change, environmental risks, energy challenges, landscape and cultural heritage. Thus, it is possible to find a call for regions in order to “decreas[e] greenhouse gas emissions and adjus[t] their socioeconomic systems to a low carbon economy. Climate change may also lead to new development opportunities, such as within agriculture, green economy and renewable energy production” (p. 6, point 20).

**Chapter III** defines six territorial priorities for the development of the European Union and the successful implementation of the EU2020 Strategy:

- 1. Promote polycentric and balanced territorial development. Within this priority, there is a particular point devoted to “encourage cities to form networks in an innovative manner” (p. 7, point 25).
- 2. Encouraging integrated development in cities, rural and specific regions. In relation to specific regions, the Treaty of Lisbon is quoted (see section 3.14), embracing: coastal zones, islands, mountainous areas, low population density, etc.
- 3. Territorial integration in cross-border and transnational functional regions. It is considered that the integration of territories through territorial cooperation is critical for global competitiveness.
- 4. Ensuring global competitiveness of the regions based on strong local economies. Within this priority, the following point can be highlighted: “strengthening research, human capital, the capacity for innovation and bringing ideas to the market are essential” (p. 8, point 33).
- 5. Improving territorial connectivity for individuals, communities and enterprises. Specifically, point 35 is devoted to noting that

accessibility to information, knowledge and mobility are strategic assets for territorial cohesion.

- 6. Managing and connecting ecological, landscape and cultural values of regions. Chapter III ends with the idea of protecting European rural and urban landscapes (point 38).

In relation to the territorial priorities defined in **Chapter III**, Böhme *et al.* (2011: 26) attempted to provide correlations with the EU2020S by means of a double fold table (Table 10).

**Table 10 Correspondence between Priorities of the EU2020S (vertical) and Priorities of the TA2020 (horizontal)**

	Smart growth [2]	Sustainable growth [3] [4] [5]	Inclusive growth [1] [6] [7] <sup>48</sup> [8]
1	+	No correspondence	+
2	+	+	+
3	+	No correspondence	No correspondence
4	+	+	+
5	+	+	+
6	+	No correspondence	No correspondence

Source: Böhme *et al.* (2011: 26).

These authors express that there is no clear link in several cross junctions, but indeed on those fields marked with + “it is generally not easy to find relevant territorial concepts to clarify its nature” (Böhme *et al.*, 2011: 27). Indeed, these authors suggest that the TA2020 “frequently refers to smart, sustainable and inclusive growth but fails to present concrete predictions about how this growth might reshape the EU territory in the long run” (*op. cit.*). Beyond Table 10, Böhme *et al.* (2011) offer a detailed approach of the same issue in Table 11. This is a valuable contribution for the SIESTA Project.

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48 [6] and [7] are considered by SIESTA as smart growth headline targets, but here the distribution of headline targets as established by Böhme *et al.* (2011) is maintained.

**Table 11 Issues Linking EU2020S (vertical) and TA2020 (horizontal)**

	Smart growth	Sustainable growth	Inclusive growth
1	- Investing in education - Interactions between metropolis at the EU scale - Interactions between the main national growth poles		- Services of general interest (sparsely populated areas)
2	- Focus on territory-bound factors (local <i>milieus</i> , etc.)	- Compact cities (sustainable cities)	- Enlargement of local labour markets
3	- Critical mass of means through territorial cooperation - Trans-border accessibility		
4	- Global accessibility - European accessibility - Focus on territory-bound factors (local <i>milieus</i> , etc.) - Local innovation systems & networks	- Territorial/local related characteristics for energy production	- Revitalisation of cities
5	- National and daily accessibility between metropolises - Accessibility to the main and secondary centres and between them - E-connectivity - Access to energy networks	- Public transport - Sustainable transport (including modal split and intermodal change) - Access to energy networks (macro-regional and national grids for renewable energy transmission) - Renewable and local energy production	- Accessibility to the main, and secondary, centres (including access to services of general economic interest) - Public transport
6	- Wise management of cultural and natural assets		

Source: Böhme *et al.* (2011: 65).

Be that as it may, what Böhme *et al.* (2011) attempt to do is show the TA2020 can contribute to the EU2020S, whereas the SIESTA Project is intended to understand how the EU2020S can be territorialised; this different point of departure represents a notable difference. It can be useful to reproduce the "territorial keys" as understood by Böhme *et al.* (2011) when linking the TA2020S with the EU2020S, as follows:

- Accessibility, including transport, energy and e-connectivity.
- Services of general economic interest, both market and non-market services.
- Territorial capacities/endowments/assets: local *milieus*, natural and cultural assets, renewable and local energy production, etc.
- City networking formed by the interactions between metropolises and secondary growth poles.

- Functional regions for coherent contiguous territories, formed by adjacent territories tied together by intensive socio-economic relations.

Finally, **Chapter IV** of the TA2020 considers the Lisbon Treaty and other strategic documents to encourage EU institutions, member states, regional and local authorities and private actors to take part in the implementation of the TA2020. This chapter recommends to member states mechanisms, key instruments, European programmes (ESPON, INTERREG IVC, INTERCAT and URBACT) and guidelines to define the tailored concepts, goals and tools for enhancing territorial development.

Furthermore, from the perspective of the SIESTA Project, it is important to also report the TA2020 background document so-called *The Territorial State and Perspectives of the European Union*.<sup>49</sup> This report was coordinated by the Ministry of National Development of Hungary and the Drafting team members of the TA2020, with the contribution of the European Environment Agency. The background document was especially important in order to revise the Territorial Agenda that had been accepted in 2007 in Leipzig (Germany), leading towards the TA2020 adopted in 2011.

The document begins by highlighting that, when comparing the situation of 2007 with the current situation (2011), it is possible to appreciate important events and circumstances influencing certainly the future development of the whole EU and its member states, cities and regions. Among the new issues which have a significant influence on territorial structures of the economy and society, the following ones can be highlighted:

- Territorial impacts of the financial and economic crisis and the recovery.
- The increased impact of globalisation and its anticipation.
- The issue of territorial integration after the enlargement of the EU.
- The growing challenges from the demographic imbalances.
- The high volatility of energy prices.
- The issues of energy security, renewable energies and energy efficiency.

Nonetheless, the update of the new document gives the opportunity to address these fields which had not been previously described.

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49 Available at: <[http://www.eu-territorial-agenda.eu/Reference%20Documents/updated%20Territorial%20State%20and%20Perspective%20of%20the%20EU\\_May\\_2011\\_FINAL.pdf](http://www.eu-territorial-agenda.eu/Reference%20Documents/updated%20Territorial%20State%20and%20Perspective%20of%20the%20EU_May_2011_FINAL.pdf)> (Access 2011-11-11).

The document is structured in five chapters:

- Rethinking territorial matters.
- Trends influencing territorial development.
- Changing territorial structures of the EU.
- The contribution of policies to territorial development: Performance and recommendations.
- Territorial perspectives.

**Chapter 1** analyses the relationship between the TA2020 and the EU2020S and draws a conclusion: territorial policy should contribute to the achievement of the EU2020S targets and at the same time the implementation of the EU2020S shall contribute to territorial cohesion. Another relevant matter is the relationship between the TA2020 and urban policy.

**Chapter 2** presents the most significant trends influencing territorial development in the EU. This part of the document contains contents according to a thematic approach, including:

- Increased impact of globalisation.
- Demographic and social challenges.
- Accessibility and transport conditions.
- Climate change.
- Energy challenges.

**Chapter 3** describes the main territorial structures of Europe, as follows:

- Core-periphery, North-South and East-West.
- Urban-rural relations.
- Urban regions and major cities.
- Rural areas.
- The main geographical regions (macro-regions) of Europe, considering potentials and challenges, and distributed as follows:
  - Northern Europe.
  - Southern Europe.
  - Western Europe.
  - Central and Eastern Europe.

**Chapter 4** relates to the contribution of different policies to the territorial development. EU policies are distributed among:

- Matters in relation to cohesion policy, urban development policies and maritime policy. This group comprises the horizontal policies.
- Community sectorial policies: Common Agricultural Policy, energy, climate change, transport, environment, competition, R&D, fishery and social policy.

This classification differs from the similar systematisation adopted by the 5<sup>th</sup> Cohesion Report (see section 3.16). The chapter tries to explain all territorial implications of these policies and offers recommendations for strengthening the EU territory. Most of the policy recommendations included in Chapter 4 are useful to the development of the SIESTA Project as well.

Finally, **Chapter 5** is the part of the document in relation to territorial perspectives. It summarises the main territorial challenges currently emerging in the EU scenario. This section is very similar to the TA2020 document itself (see above).

It has to be said that the document *The Territorial State and Perspectives of the European Union* includes a list of maps to illustrate its contents, at several scales (NUTS0, NUTS1, NUTS2 and NUTS3).

### 3.19 Overall List of Indicators Considered, Quoted and Recommended in the EU2020S Analysis

Indicators	T1	T2	T3	T4	T5	T6	T7	T8	T9	%
[1] Employment rate of the population aged 20-64.	1	1			1			1	1	56
[2] % of GDP invested in R&D.	1	1	1				1	1		56
[3] Variation of greenhouse gas emissions compared to 1990 levels.	1	1	1			1				44
[4] Share of renewable energy sources in final energy consumption.	1	1				1				33
[5] Energy efficiency.	1	1		1		1				44
[6] Drop out rate of early school leavers.	1	1			1			1	1	56
[7] Share of population aged 30-34 having completed tertiary education.	1	1	1		1			1		56
[8] Variation of people living below the respective national poverty lines.	1	1							1	33
[9] Growth measured as GDP variation.	1	1								22
[10] Growth measured as GDP per capita.	1									11
[11] Internet velocity access.	1		1	1						33
[12] % of people aged.	1							1	1	33
[13] Working hours per worker.	1									11
[14] Public spending.	1	1								22
[15] Share of high-tech firms.	1									11
[16] Shanghai index of universities of the world.	1									11
[17] Retirement age linked with life expectancy.		1								11
[18] Unemployment rate.		1								11

Indicators	T1	T2	T3	T4	T5	T6	T7	T8	T9	%
[19] At-risk-of poverty rate.		1							1	22
[20] Severe material deprivation.		1							1	22
[21] People living in households with very low work intensity.		1							1	22
[22] Decomposition of GDP growth.		1								11
[23] Real primary expenditure versus real GDP growth		1								11
[24] Evolution of price competitiveness relative to the rest of the euro area.		1								11
[25] Youth unemployment.		1			1			1		33
[26] Public debt level in % of GDP.		1								11
[27] Bank lending in the EU.		1								11
[28] Non-performing loans in the EU.		1								11
[29] Public interventions in the EU banking sector.		1								11
[30] Banking sector assets abroad.		1								11
[31] Total banking sector assets, in percentage of GDP.		1								11
[32] Employment rate by gender.		1								11
[33] Percentage of jobs with high or medium level skills.		1								11
[34] Percentage of jobs with low level skills.		1								11
[35] Lifelong learning participants.		1						1		22
[36] Investment in higher education (universities), measured in percentage of GDP.		1								11
[37] Social expenditure, measured in percentage of GDP.		1								11
[38] Public investment in education.			1							11
[39] Public investment in ICTs.			1							11
[40] Research ranking.			1		1					22
[41] Number of researchers.			1					1		22
[42] New doctorate graduates per 1000 population aged 25-34.			1							11
[43] Percentage youth aged 20-24 having attained at least upper secondary level education.			1							11
[44] International scientific co-publications per million population.			1							11
[45] Non EU-doctorate students per million population.			1							11
[46] Business R&D expenditures as % of GDP.			1							11
[47] Innovative SMEs collaborating with others as % of SMEs			1							11
[48] SMEs (more than 10 employees) introducing product or process innovations as % of SMEs.			1							11
[49] Patent applications.			1							11
[50] Contribution of medium-high-tech and high-tech products to the trade balance.			1							11
[51] Employment in knowledge-intensive activities.			1							11
[52] Percentage of household access to broadband.				1						11
[53] Percentage of citizens using the internet for accessing eGovernment services.				1						11
[54] Percentage of population buying online.				1						11
[55] Enterprises purchasing and selling electronically.				1						11
[56] Roaming average.				1						11
[57] Internet use.				1						11
[58] Internet use for disadvantaged people.				1						11
[59] Population that has never used the Internet.				1				1	1	33
[60] Public investment in ICT R&D.				1						11
[61] E-skilled jobs in percentage of total jobs.					1			1		22
[62] ICT practitioners.					1			1		22



Indicators	T1	T2	T3	T4	T5	T6	T7	T8	T9	%
[63] Students studying abroad.					1					11
[64] Investment in the university system, including public and private funding combined, and expressed as percentage of GDP.					1					11
[65] University students studying abroad.					1					11
[66] Percentage of European 20-24 year olds not working nor being educated.					1					11
[67] Vocational Education and Training (VET) students.					1			1		22
[68] Patent rates in clean energy technologies compared to patent rates in fossil technologies.						1				11
[69] Waste evolution.						1				11
[70] Variation of greenhouse gas emissions produced by the transport sector compared to 1990 levels.						1				11
[71] Protected areas included in Natura 2000 network, in percentage.						1				11
[72] Improvement in the status of protection of the Natura 2000 Network, measured in percentage of habitat and species assessments of the protected areas .						1				11
[73] Preparing for re-use and the recycling of waste materials...						1				11
[74] Preparing for re-use, recycling and other material recovery, including...						1				11
[75] Improvement in competitiveness, comparing the productivity and cost developments.							1			11
[76] Number of new jobs created in industry and industry-related services.							1			11
[77] Number of new jobs created in industry and industry-related services created in SMEs.							1			11
[78] Rate at which manufacturing output rises.							1			11
[79] Rate at which manufacturing output in the eco-industries rises.							1			11
[80] Share of medium- and high-technology manufacturing sectors in total manufacturing value-added.							1			11
[81] Share of medium- and high-technology manufacturing sectors in total manufacturing employment.							1			11
[82] Percentage of GDP of manufacturing sector in total GDP.							1			11
[83] Industrial production.							1			11
[84] Percentage of industrial employment in total employment.							1			11
[85] Innovation performance, that is, percentage of R&D transferred into innovation.							1			11
[86] Percentage of manufacturing companies with voluntary certified environmental management practices (schemes EMAS and ISO14001).							1			11
[87] Staff working in public employment services.								1		11
[88] Job losses for workers in temporary work.								1		11
[89] Unemployment among migrant population (non-nationals)								1	1	22
[90] Percentage of highly-qualified workforce in relation to total workforce.								1		11
[91] Professionals in health sector.								1		11
[92] Percentage of workers in involuntary temporary work.								1		11
[93] Percentage of workers in part-time work.								1		11
[94] Percentage of in-work poverty.								1	1	22
[95] Undeclared work.								1		11
[96] Percentage of business which are small and medium-size enterprises (SMEs).								1		11
[97] Percentage of self-employment.								1		11
[98] Fertility rate.								1		11
[99] Immigration rate.								1		11
[100] Percentage of risk of poverty for the unemployed population.									1	11
[101] Percentage of working age population in households where nobody works.									1	11
[102] Women at risk of poverty.									1	11

Indicators	T1	T2	T3	T4	T5	T6	T7	T8	T9	%
[103] Children at risk of poverty.									1	11
[104] Young at risk of poverty.									1	11
[105] Elderly at risk of poverty.									1	11
[106] Percentage of children between 4 years old and the beginning of compulsory education participating in early childhood education and care.									1	11
[107] Volunteers.									1	11
[108] Percentage of the social enterprise sector in the total business.									1	11
[109] Long term unemployment									1	11

**Table 1** Indicators considered in the EU2020S.

**Table 2** Indicators considered in the Annual Survey Growth.

**Table 3** Indicators considered in the Flagship "Innovation Union".

**Table 4** Selection of indicators considered in the Flagship "A Digital Agenda for Europe".

**Table 5** Indicators considered in the Flagship "Youth on the Move".

**Table 6** Indicators considered in the Flagship "A Resource-efficient Europe".

**Table 7** Indicators considered in the Flagship "An Integrated Industrial Policy for the Globalisation Era".

**Table 8** Indicators considered in the Flagship "An Agenda for New Skills and Jobs".

**Table 9** Indicators considered in the Flagship "The European Platform against Poverty and Social Exclusion".

## 4. Achievement of the Final List of Indicators to Be Included in the Atlas (SWS4)

This section describes the process that has led to the selection of the final set of indicators that have been included in the EU2020S Atlas.

### 4.1. Indicators Selection Process, Data Sources and Availability

Three steps have been carried to get the final list of indicators to illustrate the EU2020S Atlas. Obviously, these steps are directly related to data sources issues and, in general, data availability shortcomings. These steps require extended clarification and will be detailed in the following sections by considering the next points:

- Firstly, the procedure to obtain the first list of indicators constituting the Project's point of departure. This is explained in point 4.1.1.
- Secondly, the data availability screening once the first set of indicators was selected. This is explained in point 4.1.2.

- Thirdly, the definition of the definitive set of indicators to be used in the Project, leading towards the Atlas. This is explained in point 4.1.3.

Finally, we explained in section 9 some minor changes in the final list of indicators related to the final elaboration of the Atlas.

#### **4.1.1. The First Selection of Indicators**

If the basic aim of the Project is to obtain a territorial expression of the EU2020S, it is evident that the indicators to be mapped have to be based on the EU2020S documentation and directly related to it. This has been one of the main functions of the preliminary EU2020S analysis (see Section 3 of the present memory). The systematic list of all the indicators considered, quoted and recommended in the EU2020S documentation and the directly related EU2020S-documentation has been finally concreted in a catalogue of 81 indicators to be included in the Atlas (section 3.19). Some of these 81 indicators have been finally not considered in the Atlas because, on one hand, the list of indicators committed by the SIESTA Project Proposal was between 50 and 75; on the other hand, some of the indicators did not have an acceptable geographical coverage of the EU27. The concrete reasons to reject indicators of the final list are explained in detail in section 4.1.2.3.

The procedure to overcome the early rough list of indicators (Section 3.19) and to obtain the first selected list of indicators to work with (Table 12) is based on the following criteria:

- Indicators directly considered as headline targets by the EU2020S (see section 3.1) are automatically selected. It is consistent to take the targets that the EU2020S establishes and that the Annual Growth Survey is calculating (at the member state scale) each year as indicators. The only point to mention is that the headline targets are usually expressed in the available documentation as five sentences, while, in fact, these five sentences have to be disaggregated into eight individual headline targets and correspond with eight individual indicators.
- Immanent to the EU2020S centrepiece document (and mentioned repeatedly in other analysed documents) is the measure of growth, expressed as regional GDP variation or as GDP per capita for each region. If the EU2020S basically deals with promoting growth, it is obvious that growth has to be measured and analysed, therefore comprehensibly this is considered to be compulsory as well.
- Some flagship initiatives quote indicators which are essential. As the flagship initiatives are considered constitutive parts of the

EU2020S, they are compulsory selected. This is the case of Innovation Union (3 indicators) and The European Platform against Poverty and Social Exclusion (3 indicators). Additionally, it has to be noted that the flagships Innovation Union and A Digital Agenda for Europe comprise an annex with a set of appropriate indicators to measure innovation and the digital society,<sup>50</sup> but not all of them are taken as the list is wider than it is possible for this Project and, indeed, this Project does not focus on these specific subjects, but on the EU2020S as a whole.

- In relation to the resting indicators, first of all a frequency table has been elaborated in order to know which are the most-quoted indicators (Section 3.19). In parallel, a qualitative analysis of which are the most significant indicators in relation to the EU2020S documentation has also been carried out. In accordance with the Specification, the possible indicators were analysed in relation to other documents considered in the Background Analysis, such as the 5<sup>th</sup> Cohesion Report or the Territorial Agenda (section 3). In addition, it has to be said that Annex III to SIESTA Subsidy Contract mentioned the possibility of taking advantage of qualitative information for producing the maps. This was studied but it was not clear how to use this qualitative or semi-quantitative information without criticism. For instance, in the Background Analysis it was detected that some EC official Communications consider university performance or excellence lists, usually with an associated ranking;<sup>51</sup> in the end, this was ruled out due to the difficulty associated with representing and validating the quality of these sources

Finally, 54 indicators were identified as appropriate through this procedure and distributed following the sections and subsections that the Annex to the Specification propose (Table 12). This early list of indicators is included in table 12 and reasonably covers all the topics that the Annex to the Specification includes. It has to be mentioned that the indicators references in section 3.19 are expressed in brackets [] and in table 12 in are preceded by an at (@).

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50 Innovation Union – COM(2010) 546 final, pp. 36-37, as a “Performance Scoreboard for Research and Innovation”; and A Digital Agenda for Europe – COM(2010) 245 final, pp. 40-41, as “Key Performance Targets”.

51 For instance, the Academic Ranking of World Universities, widely known as the *Shanghai Ranking*. Available at: <<http://www.arwu.org/>> (Access 2011-10-4).

**Table 12 First List of Indicators**

<b>SMART GROWTH</b>
<b>Innovation</b>
[2]→@1 % of GDP invested in R&D.
[41]→@2 Number of researchers.
[46]→@3 Business R&D expenditures as % of GDP.
[47]→@4 Innovative SMEs (more than 10 employees) as % of SMEs.
[49]→@5 Patent applications.
<b>Education</b>
[6]→@6 Drop-out rate of early school leavers.
@7 Persons aged 25-64 with upper secondary education attainment.
[7]→@8 Share of population aged 30-34 having completed tertiary education.
[42]→@9 New doctorate graduates per 1000 population aged 25-34.
[67]→@10 Vocational Education and Training (VET) students.
[38]→@11 Public investment in education.
[36]→@12 Investment in higher education (universities), measured in percentage of GDP.
<b>Digital Society</b>
[52]→@13 Percentage of household access to broadband.
[54]→@14 Percentage of population buying online.
[55]→@15 Enterprises purchasing and selling electronically.
[53]→@16 Percentage of citizens using the internet for accessing e-Government services.
@17 Population that have never used a computer.
[59]→@18 Population that has never used the internet.
<b>SUSTAINABLE GROWTH</b>
<b>Green Economy</b>
[167] Areas covered by ecological agriculture→@19 Percentage of farmlands cultivated with organic agriculture.
[79]→@20 Rate at which manufacturing output in the eco-industries rises.
[112]→@21 Percentage of eco-industry in terms of employment.
[86]→@22 Percentage of companies with voluntary certified environmental management practices (schemes EMAS and ISO14001).
[161]→@23 Employment in industries with high energy spending.
[69] Waste evolution →@24 Regional coverage rate of municipal waste collection.
[69] Waste evolution →@25 Population connected to wastewater treatment.
<b>Climate, Energy And Mobility</b>
[3]→@26 Variation of greenhouse gas emissions compared to 1990 levels.
[4]→@27 Share of renewable energy sources in final energy consumption.
[5]→@28 Energy efficiency.
@29 Employment in renewable energies industries.
[147]→@30 Number of hours lost in congestion.
[122]→@31 Climate change vulnerability index.
<b>Competitiveness</b>

[9]→@32 Growth measured as GDP variation.
[10]→@33 Growth measured as GDP per capita.
[118]→@34 Labour productivity.
[50]→@35 Contribution of medium-high-tech and high-tech products to the trade balance.
[51]→@36 Employment in knowledge-intensive activities.
[119]→@37 Globalisation vulnerability index.
<b>Environment</b>
[71]→@38 Protected areas included in Natura 2000 network, in percentage.
[72]→@39 Improvement in the status of protection of the Natura 2000 Network, measured in percentage of habitat and species assessments of the protected areas.
@40 Access of population to natural areas.
<b>INCLUSIVE GROWTH</b>
<b>Employment and Skills</b>
[1]→@41 Employment rate of the population aged 20-64.
[32]→@42 Employment rate by gender.
[17]→@43 Relation between the retirement age and life expectancy.
[35]→@44 Lifelong learning participants.
[62]→@45 People working in the ICT sector.
@46 Staff working in governments and other public agencies.
<b>Fighting Poverty</b>
[8]→@47 People at risk of poverty or social exclusion.
[19]→@48 People at risk of poverty after social transfers.
[20]→@49 Severe material deprivation.
[21]→@50 People living in households with very low work intensity.
[18]→@51 Unemployment rate.
[25]→@52 Youth unemployment.
[89]→@53 Unemployment among migrant (non-EU) population.
[91]→@54 Professionals in health sector.

#### 4.1.2. Subsequent Selected Indicators Management

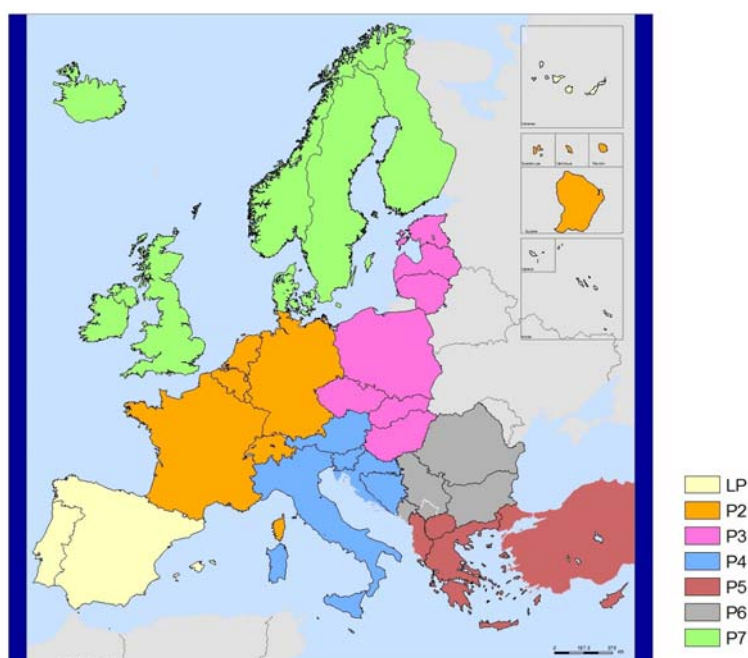
Beyond the early definition stage of an appropriate set of indicators (SWS2), the intensive examination of data availability at the appropriate geographical scale has shown uneven results and resulted in changes to the first list. The SIESTA Project has systematically tried to develop the work at the larger scale, that is, NUTS 3 and urban areas, but only when this is possible in terms of data availability. This means that, when data are not available for NUTS3, then NUTS2 scale is used and, in some exceptional cases that will be justified in the following paragraphs, NUTS1 or NUTS0. It has to be said that a particular detail on the consideration of the urban area scale is developed in point 4.2.2.

In order to check data availability, EUROSTAT, ESPON 2013 DB and previous ESPON projects have been intensively checked and additional queries have been sent to the OECD, EEA and DGREGIO. Our first option has been always the use of indicators available in official data sources, as EUROSTAT, but the frustrating lack of data at regional level of some important indicators has pushed us to look in the national statistics institutes to develop new indicators at regional scale. This way, the partners of the SIESTA Project have carried an exhaustive analysis for each studied country in order to check if data exists at NUTS2/3 level, mainly in the national institutions of statistics, even if EUROSTAT or the other pan-European data sources do not offer them. In fact, each Project Partner has had a list of allocated countries under their responsibility (see Map 1). Data searching in national institutions of statistics has consisted of access, queries and downloading from the respective webpage and an exhaustive emailing feedback, asking for the confirmation of data availability; in some particular cases a specific data search has been carried out in the government institution sectors, such as the respective ministries of the environment and/or energy and/or industry for the indicators on climate change mitigation and energy efficiency.

The following paragraphs of this section 4.1.2 explain the data availability searching results distributed in three main groups of indicators:

- Those considered “compulsory” as justified above. This is explained in point 4.1.2.1.
- Those available at EUROSTAT or other reliable pan-European databases. This is explained in point 4.1.2.2.
- Those which are not in the previous situations, but have been tested. This is explained in point 4.1.2.3.

**Map 1 Distribution of Studied Countries Between Project Partners**



#### 4.1.2.1. The “Compulsory” Indicators

In relation to the headline targets, EUROSTAT offers a specific database for them, but it is available at the member state level.<sup>52</sup> Be it as it may, the definition which is given in this specific database is always considered the official one for the purposes of this project. With these official statistical definitions, data availability for NUTS2/3 and urban areas have been scanned and the results are as follows:

- @1, @6 and @8 are available at NUTS2 level and none of the members of the SIESTA Partnership has been able to obtain this at NUTS3 level. These datasets are neither available at city level but in the case of @6 and @8 similar indicators have been found and they are explained in point 4.2.2. In the case of @1, the FOCI Project calculated the data for urban areas (LUZ) approximated by NUTS2, but its use in this SIESTA Project would be redundant as NUTS2 areas are already being represented. Indicators @6 and @8 were available at EUROSTAT webpage to be downloaded at NUTS0 or NUTS 1 level. Data for these indicators at NUTS 2 level were provided by EUROSTAT after a web query for the overall EU27 countries (more specifications about data of these indicators can be consulted in section 4.2.3 of this report).

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<sup>52</sup> Available at:  
<[http://epp.eurostat.ec.europa.eu/portal/page/portal/europe\\_2020\\_indicators/headline\\_indicators](http://epp.eurostat.ec.europa.eu/portal/page/portal/europe_2020_indicators/headline_indicators)>  
(Access 2012-3-25).



- @47 is available for NUTS2 level in most of the countries but others have to be shown at state level (see point 4.2.3 for the criteria on combining different geographical scales). As this is a union of three sub-indicators calculated by EUROSTAT, it is non-productive to query the national statistical offices requesting this aggregate indicator as they do not provide it. This means that the working scale will be the one facilitated by EUROSTAT.
- @41 is available for NUTS2. This is not available at urban scale, but different indicators on unemployment (the rough opposite to employment) are available at the urban scale.
- @26, @27 and @28 are only available at member state level. Regarding @26, currently a regionalisation of greenhouse gas emissions does not exist, being a quite controversial issue in several countries; it is true that some member states have internal surveys on this matter (i.e. Spain), but these calculations are not consistent in relation to international standards and differ one to the others, and some of them are not even official but academic approximations. Indeed, this evident lack of datasets on greenhouse gas emissions at the regional scale is remarked on by the ESPON Climate Project, but the team working on that Project established a methodology to estimate regional greenhouse gas emissions derived from the national standardised data provided by the UN databases;<sup>53</sup> the SIESTA Project, following the methodology kindly provided by ESPON Climate, has estimated the regional greenhouse gas emissions at NUTS3 level, but this is only an approximation based on the national greenhouse gas emissions and the raw data are really the national. Furthermore, following the precise statistical definitions established by EUROSTAT, the data needed for making the calculations necessary to have @27 and @28 indicators at regional level have been intensively checked by partners, but unfortunately they are not available.

In relation to growth, indicator @33 is a classic measurement in the EU history of statistics and widely used by policy-makers across the EU space and by scholars in territorial research. This is available for NUTS3 level.

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53 In p. 171 of the ESPON Climate *Final Scientific Report*, available at: <[http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/CLIMATE/ESPO\\_N\\_Cli mate\\_Final\\_Report-Part\\_C-ScientificReport.pdf](http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/CLIMATE/ESPO_N_Cli mate_Final_Report-Part_C-ScientificReport.pdf)> (Access 2011-12-21), there is a map estimating regional GHG emissions derived from national level data that only shows if emissions are “low” or “high”. After contacting directly with the ESPON Climate team, they sent to the SIESTA team the underlying methodology which allows the expression of regional GHG emissions from national level data using regional population and regional gross added value data from EUROSTAT. The map calculated by the SIESTA team uses this methodology but shows the total values (Map 3).

@32 is a variation of this indicator; as previously announced, the use of trends is specifically explained in section 4.2.1.

Regarding indicators directly derived from the Innovation Union flagship initiative (@5, @35 and @36), different situations have emerged. For @5, data provided by the OECD is available at NUTS3 level. The useful disaggregation of the total amount of patents into different classes (high-tech, ICT and green) is explained in section 4.1.3. For @35, there is no data at the regional level, but OECD provides this at member state level. For @36, EUROSTAT supply it at NUTS2 level. In the cases of @35 and @36 no larger scale has been attained through the intensive data searching developed by partners.

In relation to indicators directly derived from The European Platform against Poverty and Social Exclusion flagship initiative, these are the sub-indicators that are amalgamated into @47 (that is, @48, @49 and @50). The three indicators are available for NUTS2 level at EUROSTAT and calculated in the framework of the EU-SILC survey. For these three, larger scale has not been obtained through the intensive data searching developed by partners, although in the case of indicator @48 a very similar measurement has been obtained for urban areas (see section 4.1.5).

#### *4.1.2.2. Indicators Available at EUROSTAT Databases and Equivalent*

18 indicators from those previously selected are available at EUROSTAT and other equivalent databases: @2, @3, @7, @13, @14, @17, @23, @24, @25, @34, @38, @42, @43, @44, @46, @51, @52 and @54. Detailed information on them is available in section 4.3 of this memory. However, in the context of this explanation, it is relevant to facilitate some insights about data processing. The first point to mention is that only indicator @38 is not provided by EUROSTAT but by DGREGIO, being an internal database which has been obtained after contacting by email. We had already calculated this indicator using the shapes downloaded on the EEA website,<sup>54</sup> but eventually it has been decided to work with data produced by DGREGIO as it is an official source and, indeed, included in the Fifth Cohesion Report.<sup>55</sup>

In relation to the indicators detailed in this point 4.1.2.2, only those related to unemployment (@51 and @52) are available at NUTS 3 level. The resting is at NUTS 2 level. When a database is provided by EUROSTAT at NUTS2 level and not detailed at a larger scale, no further data searching attempts are done. However, it must be said that some of these

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54 Available at: <<http://www.eea.europa.eu/data-and-maps/data/natura-2000>> (Access 2011-12-28).

55 European Commission (2010: 142).

indicators are available for urban areas and, subsequently, they will be reflected in particular maps as systematically reported in section 4.2.2.

Four indicators require a specific explanation as they have been obtained by combining different EUROSTAT datasets. These in depth explanations can be found in section 4.2.5.

#### *4.1.2.3. Discarded Indicators from SWS2*

20 indicators from those previously selected have been discarded during SWS3: @4, @9, @10, @11, @12, @15, @16, @18, @19, @20, @21, @22, @29, @30, @31, @37, @39, @40, @45 and @53. The underlying reasons for this denial are explained in the following paragraphs, while point 4.1.3 states which have been the new selected indicators in order to maintain an adequate coverage of the EU2020S principles and strategies through available statistics, thus maps.

Firstly, two indicators reported by DGREGIO (@31 and @37)<sup>56</sup> that were considered an indicator to satisfy specific EU2020S topics have been rejected. The rationale is the criticism made by the Sounding Board in this respect and because the methodology for calculating them is not evident, thus they seem to be inappropriate in the context of an easily-readable Atlas, as is desired. The same is applicable to an index developed within the EDORA Project when establishing population access to natural areas (@40),<sup>57</sup> available at ESPON 2013 DB, which at an early stage seemed to be suitable within the sustainable development thematic topic but which has subsequently been understood as of no use. To sum up, it can be said that indexes that are not calculated by the SIESTA team have remained questionable and have eventually been discarded.

Secondly, the resting indicators have been discarded after the Project Partners' enormous effort to obtain these data by asking the national statistics organisations. It has been essayed country by country in order to gather the datasets and the results of this screening, which will be detailed in the Draft Final Report, show that:

- The spatial coverage is unacceptable, with most of the countries without any regional data. For instance, @4, @9, @18, @21, @22 or @45 were impossible to be attained in the vast majority of the European countries. In the case of @53, EUROSTAT acknowledges that there is lack of reliability in its database so it has been discarded.

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56 Commission Staff Working Document *Regions 2020. An Assessment of Future Challenges for EU Regions* – SEC(2008), p. 7 and p. 13.

57 Available at: <[http://www.espon.eu/main/Menu\\_Projects/Menu\\_AppliedResearch/edora.html](http://www.espon.eu/main/Menu_Projects/Menu_AppliedResearch/edora.html)> (Access 2011-12-21).

- The consistency of definitions across the European space is very low. For instance, @19 exists in several countries, but the partners reported differences in the definition of what is understood to be *organic* or *ecologic* farming across the European space. The same is applicable with @10, where a consistent definition for all the countries was impossible. For @9, as reported in the previous point, there is a lack of data in some countries; at the same time, the countries facilitating datasets differ in definitions: some countries offer data on doctorate graduates per 1000 population aged 25-34,<sup>58</sup> while others only for total population; in addition, some depending on the region in which the student obtained the PhD, others depending on the region where the doctor lives and even some depending on the region where the PhD candidate was living before beginning the doctorate courses. In these cases harmonisation procedures are inapplicable.
- The heterogeneous political systems within Europe implicate that some data are not collected regionally as it is politically meaningless, while in other countries this is officially reported. That is the case of @11 or @12.
- One indicator which has a homogenous definition for the entire EU is @39 under the Directive 92/43/EEC. Also there is a particular dataset available at the EEA website, as quoted above. However, after examining the regional dataset at NUTS3 level, the obtained pattern is not useful in the context of the SIESTA Project, as it shows that only some specific countries have transformed Sites of Community Importance (SCIs) into Special Areas of Conservation (SACs), for instance the UK, while others, like Spain, have not carried out this process. And not having SACs is not necessarily related to the real level of natural space protection or management, which was the fact to be measured through the indicator @39. In this sense, @39 has been discarded.

#### **4.1.3. The Definitive List of Indicators**

The definitive list of indicators results from the already mentioned process carried out along SWSs 2, 3 and 4 when 20 of 54 indicators have been discarded. It has been necessary to identify alternatives for these indicators while the consistency with the EU2020S has to be maintained. As already said, this Project is qualitative driven. That means that the basic management strategy for indicators and map privileges the

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<sup>58</sup> The calculation of this indicator for this age group is proposed by the Innovation Union flagship initiative. Initially, it was attempted to maintain this condition.

EU2020S rather than the available data itself. No maps have been produced if a clear link with the EU2020S is not obvious, as the maps have to make conceptual sense within the Project.

This point 4.1.3 explains which of the indicators that emerged to substitute those rejected. The definitive list of indicators is facilitated in the following section 4.1.3.1 and was systematised through a qualitative story line embracing all the maps of the Atlas (the Atlas story line can be consulted in the SIESTA project Inception report).

In relation to the shifts in the smart growth pillar, an indicator which is directly quoted in the flagship initiative "Youth on the move" is NEET (young people aged 15-24 years old and not in employment, education or training) and congruently it has been included; at the very beginning this was not considered because EUROSTAT has not been facilitating it publically, but, after an email, it has been obtained. In this same pillar, the specific study of the OECD REGPAT database on patents,<sup>59</sup> once downloaded, showed that it specifies those patents which are particularly ICT; this non-predicted indicator, at NUTS3 level, has also been included. Furthermore, the KIT Project kindly facilitated broadband penetration for NUTS2 and this has been considered worthwhile in the context of the digital society objectives expressed by the flagship initiative A Digital Agenda for Europe and indeed it is one of its "key performance targets".

In relation to the shifts in the sustainable growth pillar, this was the section providing greater problems in terms of data availability, as reported in the previous point 4.1.2.3, basically because of:

- The general lack of environmental data at regional level, a fact which is confirmed by a recent specific EEA report.<sup>60</sup>
- The controversial inclusion of aspects of economic growth under the umbrella of "sustainable growth".<sup>61</sup> Apparently, the pillar should be

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59 Available at: [http://www.oecd.org/document/10/0,3746,en\\_2649\\_34451\\_1901066\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/10/0,3746,en_2649_34451_1901066_1_1_1_1,00.html) (Access 2012-1-10).

60 EEA (2010): *The Territorial Dimension of Environmental Sustainability. Potential Territorial Indicators to Support the Environmental Dimension of Territorial Cohesion*. Copenhagen: EEA.

61 As it has been said in section 1, it is not the aim of SIESTA Project to assess the EU2020S itself, but its territorial dimension and implementation. However, it is significant to note here that the concept of 'sustainable growth' by the EU2020S is far from conceptually clear. Firstly, from an academic perspective 'growth' and 'development' are different concepts and usually 'sustainable' is referred to 'development' and not to 'growth'. Secondly, several scholars argue that 'sustainable development' is a contradiction or oxymoron; if associating 'sustainable' to 'development' is questionable, the idea will be even more incongruous when referring to 'growth'. These conceptual issues are reported by experts coming from different academic traditions such as: (i) Brinkman, R. (1995): "Economic Growth versus Economic Development: Toward a Conceptual Clarification", *Journal of Economic Issues*, XXIX(4): 1171-1188; (ii) Naredo, J.M. (2007): "Crecimiento insostenible, desarrollo sostenible", in Romero, J. (coord.): *Geografía humana. Procesos, riesgos e incertidumbres en un mundo globalizado*. Barcelona: Ariel. pp. 421-476; (iii) Sauv , L. (2007): "L' quivoque du d veloppement durable", *Chemin de Traverse*

devoted to a sustainability agenda as it is widely conceived, but it is clear from an in-depth analysis of the EU2020S, when referring to sustainable growth, that it is focused on economic growth. This contributes to complicate the scientific approach to this sustainable growth section of the EU2020S.

Be that as it may, there has been an effort to include specific indicators on green economy. Firstly, and as noted earlier, the screening of the OECD REGPAT has allowed us to identify types of patents at NUTS3 level, including green patents, which was a non-predicted indicator. Secondly, and as there is no data on renewable energies at the regional level, it has been thought as useful to consider the potentials of wind energy and solar energy, as they may offer "future possibilities" in this respect; these data has been downloaded through ESPON 2013 DB, coming from ReRisk Project. Thirdly, for measuring sustainable development in relation to curbing greenhouse gas emissions, it is essential to take into account the transport sector and in that respect measurements on congestion have been introduced at NUTS2 level and a particular indicator available at URBAN AUDIT (EUROSTAT) on commuting.

In relation to growth measuring under the sustainable growth objective, one of the members of the Sounding Board asked for more indicators in this respect, apart from those already considered (i.e. @32, @33, @34). One which has been introduced by accepting the Sounding Board's direct advice is the public debt rate in percentage of GDP, which clearly compromises growth and is published yearly under the EU2020S framework through the Annual Growth Report; an effort has been made to obtain public debt at the regional scale across the European space but the feedback from partners has been discouraging: only in some countries is it possible to obtain the data for regional/state governments, but even in these cases it is unclear how to distribute the national/federal debt among regions; the only definitive option has been to map the state level. In relation to economic growth under the sustainable growth section, a second indicator which has been intensively searched for on a regional scale and that has finally been impossible to achieve is the contribution of medium and high-tech products to the trade balance.

In relation to the shifts in the inclusive growth pillar, the new indicators have been basically obtained through intensive data searching at EUROSTAT. Comparatively, the third pillar in the first proposal of indicators list received less attention than the other two pillars (see table 12 in section 4.1.1), but this has further been considered as undesirable.

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: *Revue transdisciplinaire en éducation à l'environnement*, 4: 31-47; or (iv) Blewitt, J. (2009): *Understanding Sustainable Development*. London: Earthscan.

In this respect, the indicator on the lowly educated population is understood to be a valuable measurement of the difficulties to attain jobs and better positions for significant proportions of the European workforce. In addition, it has been considered very important to measure the disposable income per capita, beyond the indicators of growth previously quoted; this new indicator was raised in the discussion in the seminar in Paris in February 2012 and was considered valuable by all partners, as GDP per capita is not reflecting the social implications of wealth distribution that disposable income is offering. Furthermore, in terms of a specific indicator on long-term unemployment (12 months and more) has been introduced, which is important when referring to the rigidity of the labour market. Finally, the over-quotation of ageing problems has been worth considering through a standardised ageing index based on scientific literature on demographics and basic UN and EUROSTAT databases.

#### 4.1.3.1. Definitive List of Maps of the Atlas and Associated Data Details

		Map 1. 2020 index.
		<b>SMART GROWTH</b>
		<b>Innovation</b>
[2]	@1	Map 2. R&D expenditures as % of GDP.
[2]	@1	Map 3. R&D expenditures as % of GDP. Distance to national targets.
[2]	@1	Map 4. R&D expenditures as % of GDP. Trend.
[4]	@2	Map 5. Human resources dedicated in science and technology.
		Map 6. NBIC projects per urban area population. Urban areas.
[46]	@3	Map 7. Business R&D expenditures as % of GDP.
		Map 8. Employment in knowledge-intensive activities as % of total employment.
[49]	@5	Map 9. Total patent applications per capita.
[49]	@5	Map 10. High-tech patent applications as a % of total patent applications.
		<b>Education</b>
[6]	@6	Map 11. Early school leavers.
[6]	@6	Map 12. Early school leavers. Distance to national targets.
[6]	@6	Map 13. Early school leavers. Trend.
[6]	@6	Map 14. Proportion of students not completing their compulsory education. Urban areas.
[7]	@8	Map 15. Tertiary educated as % of age group 30-34.
[7]	@8	Map 16. Tertiary educated as % of age group 30-34. Distance to national targets.
[7]	@8	Map 17. Tertiary educated as % of age group 30-34. Trend.
		Map 18. Share of population having completed tertiary education (age group 25-64).
		Map 19. Share of population having completed tertiary education (age group 25-64). Urban areas.
		Map 20. Share of young people NEET.
		<b>Digital Society</b>
		Map 21. Share of people working in the ICT sector.
[45]	@5	Map 22. ICT patent applications as a % of total patent applications.
[52]	@13	Map 23. Broadband penetration.
[54]	@14	Map 24. Share of population buying online.
	@17	Map 25. Share of population that have never used a computer.
		<b>SUSTAINABLE GROWTH</b>
		<b>Competitiveness and Economic Growth</b>
[10]	@33	Map 26. Growth measured as GDP per capita in pps.
[10]	@33	Map 27. Growth measured as GDP per capita in pps. Urban areas.



[9]	@32	Map 28. Growth measured as GDP per capita in pps. Trend.
[9]	@32	Map 29. Growth measured as GDP per capita in pps variation in the years of crisis. Trend.
[11 8]	@34	Map 30. Labour productivity.
[50]	@35	Map 31. Contribution of medium-tech and high-tech products to the trade balance.
		Map 32. Number of headquarters of transnational firms. Urban areas.
		Map 33. Green patent applications as a % of total patent applications.
		Map 34. Public debt in % of GDP.
		Map 35. Public debt in % of GDP in the years of crisis. Trend.
		<b>Green Economy, Climate Change and Energy</b>
		Map 36. Regional estimation of GHG emissions.
[3]	@26	Map 37. Variation of GHG emissions compared to 1990 levels.
[3]	@26	Map 38. Variation of GHG emissions compared to 1990 levels. Distance to national targets.
[4]	@27	Map 39. Share of renewable energy in gross final energy consumption.
[4]	@27	Map 40. Share of renewable energy in gross final energy consumption. Distance to national targets.
		Map 41. Wind energy potential.
		Map 42. Solar energy potential.
[5]	@28	Map 43. Energy intensity of the economy.
[5]	@28	Map 44. Energy intensity of the economy. Distance to national targets.
[5]	@28	Map 45. Energy intensity of the economy. Trend.
[12 1]	@23	Map 46. Share of employment in industries with high energy spending in total employment.
		Map 47. Share of people commuting in total employment.
		Map 48. Share of journeys to work by car. Urban areas.
[69]		Map 49. Rate of municipal waste collection.
[69]		Map 50. Urban waste-water treatment capacity.
[71]	@38	Map 51. Protected areas included in the Natura 2000 network as a share of total area.
		<b>INCLUSIVE GROWTH</b>
		<b>Employment, Skills and Jobs</b>
[1]	@41	Map 52. Employment rate of age group 20-64.
[1]	@41	Map 53. Employment rate of age group 20-64. Distance to national targets.
[1]	@41	Map 54. Employment rate of age group 20-64. Trend.
[32]	@42	Map 55. Gender balance in employment of age group 20-64.
[18]	@51	Map 56. Unemployment rate.

		Map 57. Unemployment rate. Urban areas.
		Map 58. Unemployment rate. Trend in the years of crisis.
		Map 59. Gender balance in unemployment.
		Map 60. Gender balance in unemployment. Urban areas.
[25]	@52	Map 61. Youth unemployment rate.
		Map 62. Youth unemployment rate. Urban areas.
[35]	@44	Map 63. Lifelong learning participants.
		Map 64. Share of low-educated population.
		Map 65. Share of people qualified at level 1 or 2 ISCED. Urban areas.
[91]	@54	Map 66. Professionals in health sector per 1000 inhabitants.
	@46	Map 67. Staff working in the public sector.
		<b>Poverty and Exclusion</b>
[8]	@47	Map 68. People at risk of poverty or social exclusion rate.
[2]	@1	Map 69. People at risk of poverty or social exclusion rate. Distance to national targets.
[2]	@1	Map 70. Disposable income per capita in pps.
[2]	@1	Map 71. Median disposable annual household income in pps. Urban areas.
[4]	@2	Map 72. At risk of poverty rate.
		Map 73. Share of households with less than 60% of the national median annual disposable income. Urban areas.
[46]	@3	Map 74. At risk of poverty rate. Trend.
		Map 75. Share of severely materially deprived people in total population.
[49]	@5	Map 76. Share of people living in households with very low work intensity.
[49]	@5	Map 77. Share of long-term unemployment.
		Map 78. Share of long-term unemployment. Urban areas.
[6]	@6	Map 79. Ageing index.
[6]	@6	Map 80. Ageing index. Urban areas.
[6]	@6	Map 81. Relation between the retirement age and life expectancy.

## **4.2. Methodological Specifications on the Elaboration of Indicators and Maps**

Through this section questions related to the development of the indicators devoted to be included in the Atlas are explained. This section does not provide specific information about how the Atlas cartography has been developed because these issues are addressed in detail in the section 7. However, throughout this section the following specifications of the selected indicators (which are intrinsically related to the maps to be derived) are provided. Thus, the issues addressed in this section are the following:

- When the use of indicators of trends is envisaged? (Section 4.2.1.)
- How do we deal with the urban data in the atlas? (Section 4.2.2.)
- What were the main data problems? (section 4.2.3) Specifications about data problems in EU Candidate Countries and Western Balkans are exposed in section 4.2.4.
- What were the specific methodologies that have been used to develop indicators combining more than one indicators or datasets? (Section 4.2.5.)

### **4.2.1. The Use of Trends in Mapping**

As was mentioned above, the Atlas shall demonstrate the current territorial state and, when possible and applicable depending on data availability and thematic suitability, the recent trends of the EU regions in relation to the indicators selected to show the regional dimension of the EU 2020S. Considering the general problems related to the lack of large datasets at regional level, we must recognise that there is reduced possibility of developing maps showing more than a given year, although some interesting indicators that are detailed below are proposed as maps showing trends (development over time).

One particular condition which has been noteworthy for deciding when trends are applicable for mapping is the possibility to show the situation before the beginning of the economic crisis and the current moment. As the EU2020S combats the crisis, the cartography of the evolution of the different substantial issues during the crisis is relevant, that is, after 2008. However, the big problem is data availability, as most of the statistics at EUROSTAT for NUTS2/3 and cities are not beyond 2009, and even, in some cases, the last dataset is for 2007 or 2008. In two cases where the trend has been understood as substantial during the crisis, maps have been done at state level (NUTS0) in order to show the major shifts. This is

the case of economic growth/contraction measured in GDP variation or public debt evolution for the period 2007-2011. Another particular condition to gather maps based on trends is the expression of regional evolution, which is important to have for the EU2020S spatial analysis, not in years of crisis, but in the last decade. Prior to 1999 EUROSTAT does not systematically provide regional data for most of the Central and Eastern European countries and, indeed, because of recent statistical adjustments, now regional data for the last decade is not available for regions at NUTS2/NUTS3 in some Western European countries such as Austria or Italy. Again, it has to be emphasised that there are scarce datasets available at EUROSTAT and other feasible pan-European databases prior to the last 5 years. Indeed, the intention of the SIESTA Project has been to have all the headline targets mapped in trends for the last decade, and the rank of possibilities is as follows:

- There are 3 headline targets that have highly acceptable data series for the last decade at NUTS2 scale: @1, @6 and @8.
- In relation to greenhouse gas emissions (@26), above mentioned, this indicator is only available for the country level as required for calculating the headline target base 100 referred to 1990. The map shows the trend in total human emissions of the 'Kyoto basket' of greenhouse gases in the period 1990-2010 according with the EEA<sup>62</sup> and, outside the European space, UNFCCC statistics.<sup>63</sup>
- The resting headline targets (@27, @28 and @47) are not available at regional level for around 2000. It must be remembered that some of them are even not currently available at the regional level for the current moment. In these cases, the evolution will be done at the state level (@28). However, in the case of @27 there is no available data prior to 2006 and the last available dataset is for 2009, which makes the comparison unreasonable. And in the case of @47, the time breaks in the data series are enormous, even at state scale level, and so it has been decided to represent the change of @48 in the period of crisis, which, as has been stated before, can be understood as very similar to @47.

#### **4.2.2. The Consideration of Urban Areas**

The Specification required for making a special effort to address the urban aspects of the EU2020S in the development of the project. This is

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62 Available at: <<http://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer>> (Access 2012-3-5).

63 Available at: <[http://unfccc.int/ghg\\_data/ghg\\_data\\_unfccc/items/4146.php](http://unfccc.int/ghg_data/ghg_data_unfccc/items/4146.php)> (Access 2012-3-5).

consistent with the fact that the predicted 2014-2020 Cohesion Policy is probably going to have a new specific urban dimension.<sup>64</sup> The question was how to undertake the urban issue given the proven lack of data. Our solution has been to make use of the results of previous ESPON projects and the URBAN AUDIT dataset. It has to be reiterated that this is qualitative-driven research; that means that what is meaningful is the EU2020S. In other words, have been mapped when the indicator selected for its consistency with the EU2020S spatial analysis is available or maintains strong similarities and when differences are not noticeable. At this respect, is worthy to mention that although ESPON 2013 DB includes the vast set of indicators developed by the FOCI<sup>65</sup> ESON Project, however, most of the FOCI indicators are proxies derived from NUTS2 or NUTS3 regions. The use of these proxy indicators would be redundant in the context of the SIESTA Project as NUTS 2 or NUTS3 are already being used for mapping and the double use of them would cause a duplication of the same datasets in different maps. In this sense, the SIESTA Project uses FOCI data when it is primarily produced, for instance, the valuable indicators on the presence of transnational firms headquarters in urban areas and on the participation of urban areas in research projects in NBIC (nanotechnology, biotechnology, information technology and cognitive science, that is, the considered emerging technologies). Indeed, after taking it from FOCI, an attempt was made to obtain the indicator on participation in research projects at the regional scale under the smart growth pillar; it is true that the KIT project has calculated this indicator at NUTS2 level but, unfortunately, it is only covering the 5<sup>th</sup> Framework Programme (1998-2002)<sup>66</sup> and it is not extended towards 2006 as FOCI makes. Eventually, FOCI has been preferred, even though being only for urban areas.

In relation to URBAN AUDIT data, it is relevant at this point to give some specifications about these data provider. URBAN AUDIT is a joint effort by the Directorate-General for Regional Policy (DG REGIO) and EUROSTAT to provide reliable and comparative information on selected urban areas in Member States (MS) of the European Union (EU) and the Candidate Countries. The Urban Audit aims to provide information at three spatial levels: the Core City (administrative definition), as the basic level (Label "A"); the Larger Urban Zone (Label "LUZ"), which is an approximation of

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64 Predicted to be so-called "integrated sustainable urban development", whose factsheet is available at: <[http://ec.europa.eu/regional\\_policy/sources/docgener/informat/2014/urban\\_en.pdf](http://ec.europa.eu/regional_policy/sources/docgener/informat/2014/urban_en.pdf)> (Access 2012-3-24).

65 Future Orientation for Cities.

66 See p. 15 of the KIT *Interim Report – Scientific Report* available at: <[http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/KIT/KIT\\_Interim-Report\\_Scientific-Report.pdf](http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/KIT/KIT_Interim-Report_Scientific-Report.pdf)> (Access 2012-3-12).

the functional urban zone centred around the town/city and the Sub-City District (Label "SCD"), which is a subdivision of the city according to strict criteria (5,000 – 40,000 inhabitants in each sub-town/city district)<sup>67</sup>.

According to Urban Audit, the selection of participating towns/cities and the definition of the composition of the LUZ and the SCD in terms of spatial units need to respect certain criteria set by DG Regional Policy and EUROSTAT and those concerning statistical quality in general:

- the participating towns/cities in each country should represent about 20 % of the population in that country
- the participating towns/cities should reflect a good geographical distribution within the country (peripheral, central)
- coverage should include more medium-sized towns / cities than was the case in the Urban Audit Pilot Phase (medium-sized towns / cities are defined as having a population of between 50,000 – 250,000 inhabitants; large towns/cities are defined as >250,000)
- there should be comparability of data to enable comparative analysis between towns/cities
- data should be available

The LUZ approximate as much as possible the functional urban region taking into account the commuting of the work force into the core city. The LUZ are built as follows<sup>68</sup>:

- 1. The *building blocks* for the LUZ are the Local Area Units (i.e. communes). However, not always data are available for the LAUs and in some cases NUTS level 3 regions were used as building blocks.
- 2. The *commuting rate* is calculated as the share of the out commuters of the working population. The commuting rate threshold for including or excluding areas of the hinterland in the LUZ is set between 10-20%.
- 3. Criteria of spatial contiguity helped in adjusting the definition of the LUZ although some exception was made.

Because of problems associated to comparability between regions and availability of data it was decided that the concept of "Functional Urban

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67 Urban Audit (2004): *Methodological Handbook*. Luxembourg: Office for Official Publications of the European Communities.

68 Urban Audit, EUROSTAT Metadata, available at:

<[http://epp.eurostat.ec.europa.eu/cache/ITY\\_SDDS/en/urb\\_esms.htm](http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/en/urb_esms.htm)> (Access 2012-7-9).

Regions" (FUR) would be used as a proxy for the Larger Urban Zones (LUZ) in the Urban Audit<sup>69</sup>. The Functional Urban Area (FUA) was another territorial unit used in SIESTA Project, just for the case of the indicator *Research specialisation in NBIC technologies*, an indicator developed by the ESPON project FOCI, that was obtained through ESPON DB 2013. A Functional Urban Area for countries with more than 10 million inhabitants is defined as having an urban core of at least 15,000 inhabitants and over 50,000 in total population. For smaller countries, a FUA should have an urban core of at least 15,000 inhabitants and more than 0.5% of the national population, as well as having functions of national or regional importance.

In the SIESTA Project cities were always statistically considered as larger urban zones (LUZ) or functional urban areas (FUA). Cities were not studied individually. This is consistent with the ESPON research in this respect, which has prevented urban areas in Europe being considered only by using the data of the central city in each case (see Projects FOCI in ESPON 2013 and 1.1.1 in ESPON 2006).<sup>70</sup> This means that URBAN AUDIT is only valid when it offers data at the LUZ/FUA level.

Be that as it may, once again, there are several problems with databases. The most of the URBAN AUDIT datasets considered showed a marked lack of data in several countries; we did not get a satisfactory urban data coverage for the EU27, even by combining several years, for most of the URBAN AUDIT preselected indicators. This fact has finally compromised the use of the maps derived from URBAN AUDIT indicators in the Atlas, although the datasets were considered in the elaboration of the preliminary territorial research. Map 2 is an example of one of the maps derived from URBAN AUDIT data that was definitively rejected for its use in the Atlas as more than 3 of the main EU27 countries showed a lack of data.

Finally, it has to be remembered that, the use of ESPON region types, such as urban-rural at NUTS3 in the analytical research, allowed us to introduce specific consideration of the European urban areas through some of the SIESTA Project maps, especially those produced at NUTS 3.

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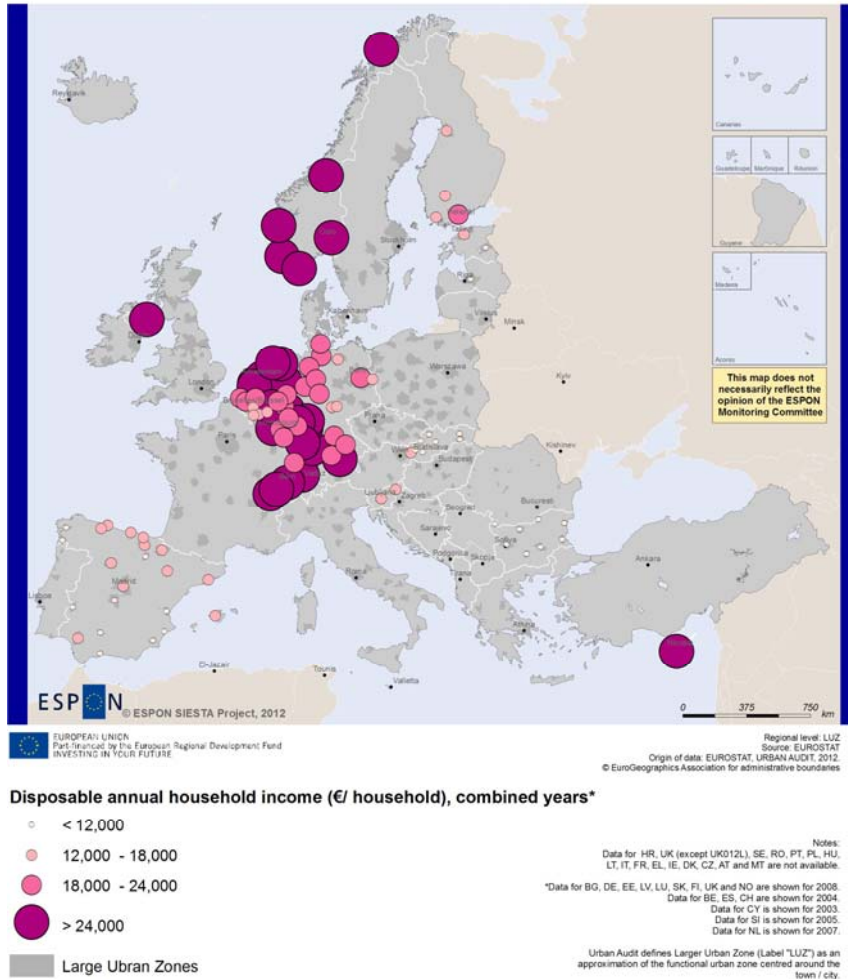
69 Urban Audit (2004): *Methodological Handbook*. Luxembourg: Office for Official Publications of the European Communities.

70 Available at: <[http://www.espon.eu/main/Menu\\_Projects/Menu\\_AppliedResearch/foci.html](http://www.espon.eu/main/Menu_Projects/Menu_AppliedResearch/foci.html)> and <[http://www.espon.eu/main/Menu\\_Projects/Menu\\_ESPON2006Projects/Menu\\_ThematicProjects/polycentricity.html](http://www.espon.eu/main/Menu_Projects/Menu_ESPON2006Projects/Menu_ThematicProjects/polycentricity.html)> (Access 2012-3-25).

**Map 2 Example of One of the URBAN AUDIT Data Derived Maps that Were not Included in the EU2020S Atlas**

**Median disposable annual household income in LUZ, combined years\***

Represented as euros per household



**4.2.3. A Systematisation of Problems Related to Data Gathering and Management**

As is clear from the previous points of this section, and beyond the general screening at EUROSTAT and other pan-European feasible data sources, there has been a screening of the availability in national statistical organisations and national thematic institutions through a checklist elaborated by the LP for each one of the suitable indicators pre-selected in SWS2, including:

- Geographical scales (from NUTS0, that is, state level, to NUTS3, including functional urban areas and other metropolitan/urban geographical structures).
- Temporal period.



- Additionally, other comments could be included in the checklist.

Each partner has had countries allocated as shown on Map 1. The precise and comprehensive results of this intensive screening basically developed during SWS2 are quite critical for the development of the project in the sense that general data availability is unfortunately too scarce. In previous points it has been mentioned how the indicators have been shifting because of data availability problems. The general problems can be systematised as follows:

- Most of the pre-selected indicators are not expressed at regional level (NUTS2/NUTS3) and, in an even worse situation, cities. In fact, as explained in point 4.1.2.1, some of the indicators considered headline targets of the EU2020S are unavailable at the regional level.
- The time series available for most of the indicators are short at regional scale (NUTS2/NUTS3), with the exception of demographic data, which usually have a longer time series, but which are almost meaningless for the SIESTA Project when taking into account its scientific rationale. Also, other “traditional” measurements like the regional GPD per capita have acceptable time series but, they are geographically uneven.
- There are punctual data gaps in some selected indicators for some specific years, including recent dates. In the case of the EUROSTAT datasets, these gaps are usually related to small sample size of confidentiality issues. In this respect it is important to make reference to three indicators that have been provided by EUROSTAT via e-mail query and that show a large set of regions for which data should not be shown due to lack of reliability of the data. This is the case of the following indicators:
  - A) Early leavers aged 18-24 from education and training NUTS 2 regions.
  - B) Persons aged 30-34 with tertiary education attainment by NUTS 2 regions.
  - C) People aged 15-24 neither in employment nor in education and training by NUTS 2 regions.

We have to mention that in these datasets provided by EUROSTAT there are a lot of values that have problems of reliability (mainly derived from small sample size). Table 13 shows those NUTS 2 regions that are flagged with an *a* (and should not be published) or a *b* (that should be printed only with a warning concerning their reliability). Be that as it may, we decided to build the maps even though the data has a lack of reliability, as

no other option exist to show an acceptable geographical coverage of the EU27 NUTS 2 regions of these three indicators, two of them being EU2020S headline indicators.

**Table 13 Regions with Data Showing Lack of Reliability in the Education Indicators Provided by EUROSTAT via E-mail Query**

	<b>Persons aged 30-34 with tertiary education attainment, 2010</b>	<b>Early leavers (aged 18-24) from education and training, 2010</b>	<b>People aged 15-24 not in employment or in education and training by NUTS 2 regions.</b>
<b>Flag a</b>	AT21, AT32, AT34, BG31, BG32, FR63, GR13, GR22, GR41, GR42, HR01, HR02, HR03, ITD1, ITF2, NL13, NL23, NL34, PL52, AT32, AT34, BG31, GR13, GR22, GR41, GR42, HR01, HR02, HR03, ITD1, ITF2, NL12, NL13, NL23, NL34, PL43, PL52, AT21, AT32, AT34, BG31, FR63, GR13, GR41, GR42, HR01, HR02, HR03, ITD1, ITF2, NL13, NL23, PL43, PL52.	AT11, AT21, AT32, AT34, BE31, DE13, DE14, DE22, DE23, DE24, DE25, DE26, DE27, DE41, DE42, DE50, DE60, DE72, DE73, DE80, DE91, DEB1, DEB2, DEC, DED1, DED2, DED3, DEG0, ES64, FI20, FR63, FR83, GR13, GR22, GR41, ITC2, ITF2, NL11, NL23, SK01, UKE2, UKF3, UKK3, UKK4, UKM5, UKM6	AT11, AT21, AT32, AT34, DE13, DE14, DE22, DE23, DE24, DE25, DE26, DE27, DE41, DE42, DE50, DE60, DE72, DE73, DE80, DE91, DE93, DEB1, DEB2, Dec-00, DED1, DED2, DED3, FI20, FR63, FR83, ITC2, NL11, NL12, NL13, NL23, NL34, NO02, NO04, NO05, NO06, NO07, PT15, PT20, PT30, UKF3, UKK3, UKM5, UKM6
<b>Flag b</b>	AT11, DE22, DE23, DE24, DE41, DE42, DE50, DE72, DE73, DE93, DEB1, DEB2, DEC, ES63, ES64, FI20, FR83, ITC2, PT20, PT30, UKD1, UKF3, UKK3, AT11, DE22, DE23, DE24, DE41, DE50, DE72, DE73, DE93, DEB1, DEB2, DEC, ES63, ES64, FI20, FR83, ITC2, PT15, PT20, PT30, UKD1, UKM6, UKF3, NL34.	AT12, AT22, AT33, BE34, BG41 ,CZ01 ,CZ06 ,DK02 ,DK05 ,ES63 , FR21, FR23 ,FR24 ,FR25, FR26, FR42 ,FR43 ,FR52 ,FR53, FR62 ,FR72 , GR21, GR42 ,ITD2, ITF5 ,LU00, NL12 ,NL13, NL21, NL31, NL34 , PL11, PL12, PL21, PL22, PL31, PL32, PL33, PL34, PL41, PL42, PL43, PL51, PL52, PL61, PL62, PL63, SE32, SE33, SI01, SI02, SK02	AT33, CH07, DK02, DK05, ES23, ES63, ES64, FR25, FR43, FR53, FR72, EL13, EL22, EL41, HR01, HR02, HR03, ITD1, ITD2, ITF2, LU00, NL21, NL22, NL31, NL42, PL34, PL43, PL52, SI01, SI02, SK01
	<b>Persons aged 30-34 with tertiary education attainment, 2000</b>	<b>Early leavers (aged 18-24) from education and training, 2000</b>	
<b>Flag a</b>	DEE1, ES63, ES64, FI20, FR83, ITC2, ITF2, NL34, PT15, PT18, PT20, PT30, SE07, UKD1, UKF3, UKK3, UKM5, UKM6	BE34, BG01, ES63, ES64, FR63, FR83, EL13, EL21, EL22, EL41, ITD1, ITD2, ITF2, NL11, NL12, NL31, NL34, PL31, PL32, PL33, PL34, PL42, PL43, PL52, PL62, PL63, PT30	
<b>Flag b</b>	BG01, BG06, FR63, EL22, EL41, EL42, ITD1, ITD2, ITF5, NL12, NL13, NL23, PL32, PL33, PL34, PL42, PL43, PL51, PL52, PL61, PL62, PL63, PT16	BE31, DEC1, DED1, DED2, DEE1, DEE2, DEE3, FI20, ITC2, NL13, NL23, NO02, NO06, NO07, SE06, SE07, SE08, SE09, UKD1, UKE2, UKK3, UKK4, UKM5, UKM6	

- Sometimes the definitions of the indicators are not consistent across the EU space when comparing those provided by different national organisations, as repeatedly stated in the previous points. This strongly compromises the possibility of building robust new tailor-made datasets different from those found at EUROSTAT.
- In general, the impossibility of gathering data at the NUTS3 level which was understood to be “the ideal scale”. The intense scrutiny of the databases has revealed the alarming lack of data on this scale, especially in the case of indicators related to energy, environment and sustainability.

Systematically, the databases used have been the following ones:

- EUROSTAT, which has provided the majority of the data, including EU-SILC, URBAN AUDIT, etc. EUROSTAT does not show all the

existing datasets and there has been an interaction between the SIESTA team and EUROSTAT to widen the available databases.

- ESPON 2013 DB plays an important role in centralising data and indicators from other ESPON projects. However, the available indicators usually shown for a single year are outdated or come from the combination of data extracted from other databases such as the EEA or EUROSTAT. In some cases, ESPON 2013 DB has re-directed the queries from SIESTA to particular projects in order to clarify the calculations and the methodologies related to specific datasets (see section 4.2.5).
- OECD, especially useful to develop the patents related indicators (REGPAT database) and also provided data on the contribution of medium-tech and high-tech products to the trade balance.
- EEA, especially useful for the greenhouse gas emissions data.
- UN, especially useful for the greenhouse gas emissions data.
- National databases, intensively checked by partners, but, as previously said, showing that:
  - Most of the countries do not collect the data requested at regional level (i.e. @11 and @12).
  - Data consistency across the EU space is very poor.

These databases have previously been quoted when explaining the different indicators initially checked or finally used, but it is considered worthwhile to list them in this point 4.2.3.

In relation to mapping derived from these data issues, two important decisions have been made:

- NUTS3, NUTS 2, NUTS1 and NUTS0 (states) scales have been combined in some cases. For each map the scale where there is more available data has been used; if in some particular countries there is a gap in this same general scale but data are available at a smaller scale, the latter has been used. In addition, it has to be said that urban scale level is always represented in independent maps as some LUZ/FUA/MEGA are bigger than NUTS2/3 areas and it is not consistent to represent urban areas and NUTS areas on the same map.
- In some particularly extreme cases, a particular map combines different dates. This is absolutely consistent with the usual *modus operandi* of ESPON Projects, as inferred from the literature revision (see section 4.2.6).

Finally, it is important to note that when a dataset is not available at EUROSTAT at NUTS 3 level but it is at NUTS 2, the latter level has been chosen instead of trying to develop a new database at the former by ourselves. In this sense, a survey of data at a larger scale country by country has not been tried to develop as this could be extremely controversial in terms of data harmonisation. EUROSTAT provides a quality standardisation and this is agreed on by SIESTA as the reasonable research basis.

In relation to the data gaps present in the different sets of harmonized data used in the project, we have only fill those gaps for which data provided by the different national statistical institutes where congruent and comparable with the main source of data. We have been very conservative at the respect of fill gaps as national data may not be incorporated to EUROSTAT, OECDE, or other harmonized datasets since it cannot be guaranteed that data from national sources is collected in a comparable way. Be as it may we have always taken into account the recommendations explained in the "ESPON Handbook on Data Collection, Harmonisation and quality control" and we have tried to use the most primary sources of information; but other hand we have avoided missing value computation procedures as both the time framework and the huge amount of data processed made unfeasible to perform the missing value computation procedures in the time allocated and available for indicator acquisition. To this lack of data we have to add the fact that quite often data gaps in time series are huge so that values computed based on available values would be difficult to obtain.

To sum up, it can be concluded that, unfortunately, the set of indicators available at EUROSTAT and other equivalent pan-European databases is scarce, especially when regarding specific thematic targets, as is the case of the SIESTA Project. As INTERCO and other ESPON Projects have repeatedly detected, it would be wishful to think that EUROSTAT and ESPON make an effort to improve the existing raw data material, especially at NUTS3 and city level.

"The official data collection is not yet fully adjusted to the newest political priorities and we are strongly urging the data providers to make the missing data available for the researchers, the policy-makers, if not for the general public. INTERCO [and SIESTA] recommends to EUROSTAT and EU member countries collecting the respective data regularly (time frequency to be defined) at least at NUTS2 level, preferably at NUTS3, otherwise by relevant territorial typologies (e.g. degrees of urbanisation,

urban/rural regional types, etc.). This should also apply to data provided by specific surveys.” (INTERCO *Draft Final Report*, p. 9).<sup>71</sup>

It is worthy to mention that in the session held in Paris in February 2012, the possibilities of mapping and analyzing data at NUTS 4 or NUTS 5 level was discussed in relation to socioeconomic issues. This was proposed by the stakeholders in order to consider internal variations within metropolitan areas such Paris or Madrid. Unfortunately, due to data scarcity and the short time period to develop the project this has been unfeasible.

#### **4.2.4. Specific Reference to EU Candidate Countries and Western Balkans**

The intention of the SIESTA Project regarding Croatia (acceding country), EU candidate countries (FYROM, Montenegro, Serbia and Turkey) and other Western Balkans countries (Albania, Bosnia and Herzegovina and Kosovo) has been to fully integrate them in the analysis at a regional scale through their consistent consideration in terms of indicators and maps. However, the lack of data for many of the indicators selected has compromised this target. A first issue to take into account regarding these countries is that some of them have not adopted a regional classification similar to NUTS in the EU27. A recent specific ESPON technical report has given insights into data availability and the process of adopting a spatial administrative division following EU NUTS classification criteria.<sup>72</sup>

Croatia, FYROM and Turkey have adopted the EU NUTS classification. Data for these countries is provided by EUROSTAT at NUTS2 for many of the indicators and is also available for the EU27 regions, but in Macedonia NUTS2 is coincident with the whole country. The rest of the Western Balkans countries are currently in the procedure of adopting a NUTS classification. Although ESPON propose “similar NUTS” divisions which satisfactorily fulfil the NUTS population criterion, this classification does not match the official administrative boundaries of the Western Balkans countries; for instance, in the case of Serbia the regionalised data obtained by P6 is not coincident with the pre-NUTS proposed by ESPON. This fact led us to decide on showing Montenegro, Serbia, Albania and Kosovo at country level. The case of Bosnia and Herzegovina is exceptional in the sense that some (scarce) data has been obtained

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71 Available at: [http://www.espon.eu/export/sites/default/Documents/Projects/ScientificPlatform/Interco/INTERCO\\_DF\\_R\\_Main-Report.pdf](http://www.espon.eu/export/sites/default/Documents/Projects/ScientificPlatform/Interco/INTERCO_DF_R_Main-Report.pdf) (Access 2012-3-25).

72 Angelidis, M. (2011): *Analysis of the Availability and the Quality of Data on Western Balkans and Turkey*. Luxembourg: ESPON.

following the basic division of the country between two entities (Republika Srpska and the Federation of Bosnia and Herzegovina), as obtained by P4, and in this case the internal Bosnia and Herzegovina division is shown. In general, for the Western Balkans countries, data are only available at NUTS0 level but only for demography, economy and labour market. Be that as it may, the involved national statistical organisations of these countries have intensively been contacted by Project partners 4, 5 and 6 (see map 1) with disappointing results: to the general lack of data for the indicators selected for the Atlas we have to add the problems related to data harmonization and comparability. These two issues that have limited the possibilities of add data for the candidate and Western Balkan countries.

#### **4.2.5. Methodological Specifications on the Elaboration of Indicators @23, @26, @34, @43 and @46**

##### *4.2.5.1. @23: Employment in Industries with High Energy Spending*

The indicator "Regional Employment in Industries with High Energy Spending" permits us to understand the industrial structure in the regions and identify the need for action in this economic sector (ESPON RERISK project). This indicator has been calculated following the ReRisk methodology, explained in its Final Report<sup>73</sup> but also kindly facilitated by email. ReRisk estimated this indicator for 2005 and the SIESTA Project has updated the indicator for 2009 (map 3).

In the framework of our project, and particularly, in the section of green economy, this indicator is especially important because it shows the regional distribution of the employment that is vulnerable to the increase of energy prices. This regional distribution is relevant from the perspective of policies focused on energy spending reduction but also in energy efficiency and competitiveness and environment protection. For companies, energy is one of the main cost factors in the production process and therefore the amount companies spent on purchasing energy is more relevant in terms of competitiveness than their actual energy consumption (RERISK, final report, pp.198). From this perspective, it seems interesting to find those areas where much of its employment depends on activities for which the budget for energy is high. Thus, this indicator allows us to get (i) the regional distribution of industries with high energy expenditure and (ii) the vulnerability of employment to rising energy prices.

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73 Available at: <[http://www.espon.eu/main/Menu\\_Projects/Menu\\_AppliedResearch/rerisk.html](http://www.espon.eu/main/Menu_Projects/Menu_AppliedResearch/rerisk.html)> (Access 2012-2-23).

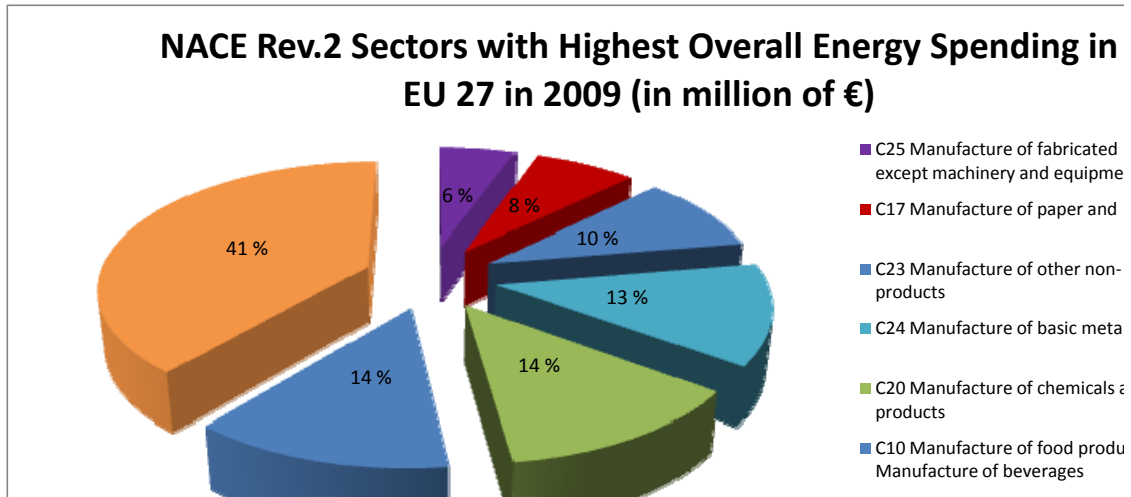
This indicator has been calculated for 2009 by using the methodology developed by the ESPON RERISK project team to measure and compare the economic vulnerability of regions in the absence of harmonized data on energy consumption. In the framework of the project RERISK the problem was solved by using data on industrial energy purchases. The data sources necessary to calculate this indicator are available in the (i) Structural Business Statistics (SBS) Database (*Total purchases in goods and services* and *energy purchases by industry*) and in (ii) regional statistics (employment by sector of activity at NUTS 2 level), both available to be directly downloaded from EUROSTAT webpage. According to the method developed by RERISK team we have to follow the next work flow:

1. Firstly, we estimated, for the EU27<sup>74</sup>, the sectors with the highest spending on energy products on NACE Rev. 2 two digit-level for 2009. Data on energy purchases by NACE Rev. 2 sectors were downloaded from EUROSTAT Structural Business statistics Database. By considering the NACE Rev. 2 sectors C (mining and quarrying) and B (manufacturing) six sectors represent 64% of industrial energy spending (Figure 3). While in the case sector C25 (Manufacture of fabricated metal products, except machinery and equipment) C11 and C10 (Manufacture of beverages and Manufacture of food products respectively) and C17 (Manufacture of paper and paper products), energy purchases do not represent a major cost item for industry, with regard to the total amount of purchases, it is relevant for the sectors C24 (Manufacture of basic metals), B08 (Other mining and quarrying) and specially for C23 (Manufacture of other non-metallic mineral products).

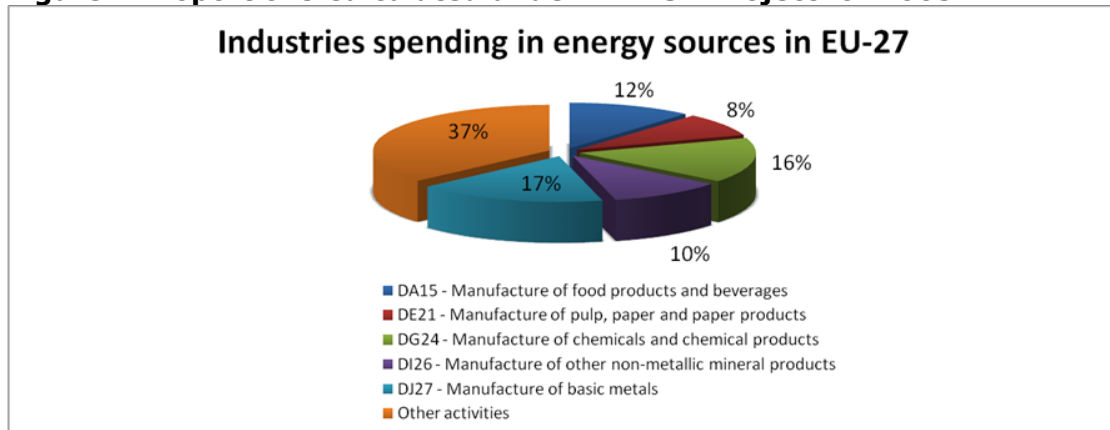
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74 Data on energy purchases for Poland and Slovenia are not available. Luxembourg has been removed from the analysis because there are too many data gaps for this country.

**Figure 3 Proportions Calculated by SIESTA Team for 2009**



**Figure 4 Proportions Calculated under RERISK Project for 2005**



In order to make our data comparable to the results envisaged by the RERISK team for 2005 we have introduced the equivalent NACE Rev.1 codes. The comparison with RERISK results for 2005 show a very similar overview of energy spending for 2009. We have also summarized the value of energy purchases in NACE sectors C10 and C11 because in the NACE Rev.1 classification the code DA15 corresponded to the NACE Rev. 2. Codes C10 and C11 (Manufacture of food products and Manufacture of beverages respectively). A decrease in the energy spending in the sector C24 (manufacture of basic metals) in comparison to 2005 data must be also noted.

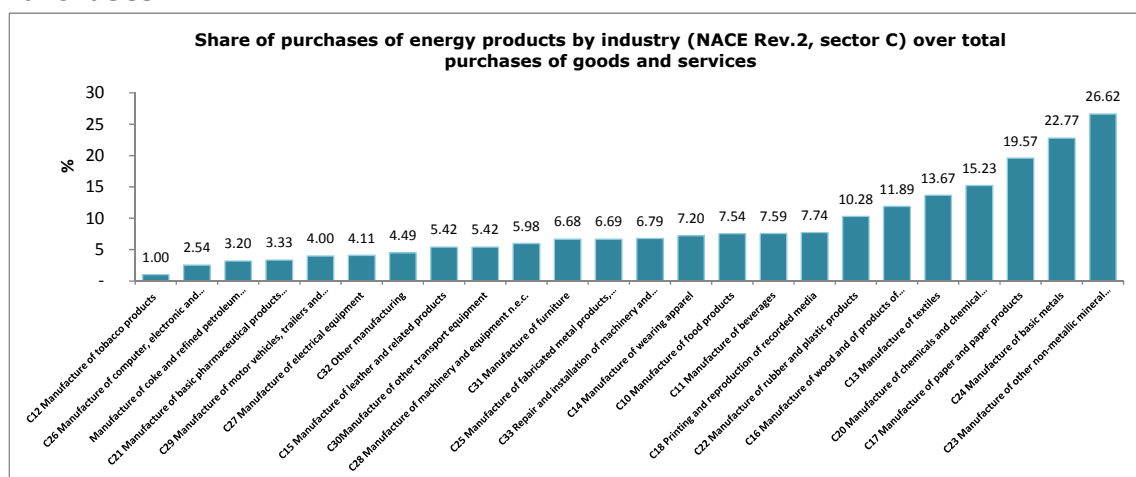
2. In a second step, and again following the RERISK method, the ratio between *total purchases of goods and services* and *the energy purchases in each sector* (down to NACE 4 digit) has been calculated for those EU countries for which the dataset is more and less complete. We have only used activities under sector C (manufacturing) because sector B (mining and quarrying) shows



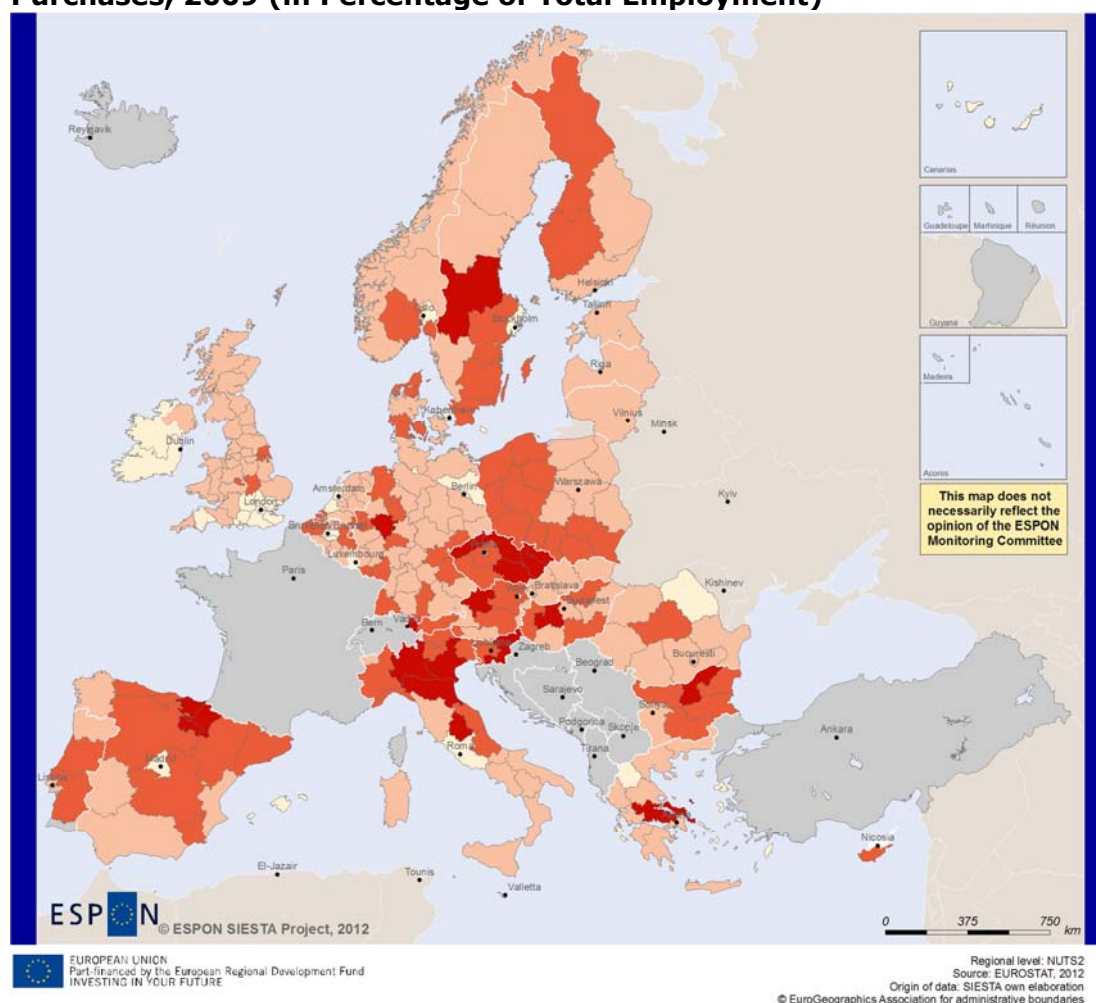
too many data gaps. This step allowed us to get an overall impression of the industry subsectors with the highest and lowest energy purchases (Figure 5).

3. Finally, we calculated the regional (NUTS 2) industrial employment that depends on these five sectors (figure 3) with the highest energy spending and which may therefore be more vulnerable to possible energy price increases. Regional employment data in industry by NACE two-digit level is available in EUROSTAT Regional Structural Business Statistics Database. From this dataset we have used the number of persons employed, that is defined as the total number of persons who work in the observation unit (inclusive of working proprietors, partners working regularly in the unit and unpaid family workers), as well as persons who work outside the unit who belong to it and are paid by it (e.g. sales representatives, delivery personnel, repair and maintenance teams). It excludes manpower supplied to the unit by other enterprises, persons carrying out repair and maintenance work in the enquiry unit on behalf of other enterprises, as well as those on compulsory military service. The resulting **indicator @46** has been calculated by summarizing the total number of employees in sectors C10, C11, C17, C20, C23 and C24 by NUTS 2 level and dividing by total regional employment.

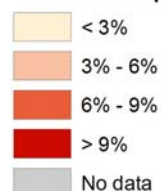
**Figure 5 Industry Subsectors with the Highest and Lowest Energy Purchases**



**Map 3 Industrial Employment Dependents on Sectors with High Energy Purchases, 2009 (in Percentage of Total Employment)**



**% of total employment, 2009.**



### *Data Quality and Gaps*

The indicator regional employment in Industries with high energy spending has been calculated using the dataset “number of persons employed” available in the EUROSTAT database Regional Structural Business statistics (SBS data by NUTS 2 regions and NACE Rev. 2 from 2008 onwards) and the dataset “total employment” available in the EUROSTAT database Regional labour market statistics. Data on “number of persons employed in industry by NACE 2 sectors” are not available for France and data for Romania are only available for 2008. Some other gaps (usually due to confidential issues) are mentioned in the table below (table 14):

**Table 14 Data Gaps in the Dataset Number of Persons Employed in Industry by NACE Rev. 2 two-digit by NUTS 2 Region**

C10	C11	C17	C20	C21	C24
BE21, BE22, BE24, DE50, DE60, FR10, FR21, FR22, FR23, FR24, FR25, FR26, FR30, FR41, FR42, FR43, FR51, FR52, FR53, FR61, FR62, FR63, FR71, FR72, FR81, FR82, FR83, FR91, FR92, FR93, FR94, IE01, IE02, LU, PT15, PT20, PT30	BE31, BE34, DE50, DE91, DE92, DEB1, DEB2, EL 11, EL13, FR10, DK01, DK05, FI13, FI19, FI20, FR21, FR22, FR23, FR24, FR25, FR26, FR30, FR41, FR42, FR43, FR51, FR52, FR53, FR61, FR62, FR63, FR71, FR72, FR81, FR82, FR83, FR91, FR92, FR93, FR94, FI13, FI19, FI1A, FI20, NL12, NL13, NL21, NL22, NL32, NL34, PT15, PT20, PT30, SE31, SE33, UKD1, UKD2, UKD3, UKD5, UKE3, UKF1, UKI1, UKJ2, UKJ3	AT1, AT11, AT12, BE31, BE34, DE22, DE23, DEB1, DEB2, GR13, GR21, GR22, GR42, FR21, FR22, FR23, FR24, FR25, FR26, FR30, FR41, FR42, FR43, FR51, FR52, FR53, FR61, FR62, FR63, FR71, FR72, FR81, FR82, FR83, FR91, FR92, FR93, FR94, LU, NL13, NL34, PT15, PT20, PT30, UKK3, UKK4	DE91, DE93, DEB1, DEB2, GR13, GR21, GR41, GR42, ES63, ES64, FI13, FI20, FR21, FR22, FR23, FR24, FR25, FR26, FR30, FR41, FR42, FR43, FR51, FR52, FR53, FR61, FR62, FR63, FR71, FR72, FR81, FR82, FR83, FR91, FR92, FR93, FR94, LU, PL31, PL33, PT15, PT20, PT30, UKG1, UKG2, UKI1, UKI2	ES63, ES64, FI13, FI20, FR21, FR22, FR23, FR24, FR25, FR26, FR30, FR41, FR42, FR43, FR51, FR52, FR53, FR61, FR62, FR63, FR71, FR72, FR81, FR82, FR83, FR91, FR92, FR93, FR94, LU, PT15, PT20, PT30	AT11, AT13, BE31, BE32, BE34, DE22, DE24, DE50, DE60, DEB2, DEB3, GR13, GR21, GR22, GR41, GR42, FR21, FR22, FR23, FR24, FR25, FR26, FR30, FR41, FR42, FR43, FR51, FR52, FR53, FR61, FR62, FR63, FR71, FR72, FR81, FR82, FR83, FR91, FR92, FR93, FR94, ITC1, ITC2, ITE1, ITE4, LU, NL13, NL21, NL23, NL32, NL33, NL34, PT15, PT18, PT20, PT30, SE11, SE32, UKD1, UKD4, UKM3, UKM6

In the case of the dataset *Purchases of energy products (in value)* there are no data for Slovenia, Poland and Malta. Data for Denmark are for 2008 because there are no data for 2009. Due to this lack of data, these countries were excluded in the calculations done to estimate the NACE two-digit sectors with the highest energy spending for the EU27. Luxemborg was also excluded due to a high proportion of data gaps in several NACE sectors.

**Table 15 Top Regions in "Regional Employment in Industries with High Energy Spending"**

regions	C10	C11	C17	C20	C23	C24	C25	Employment in industries with high energy spending, 2009	Total employment, 2009	% of employment in high energy spending
SE31	4134		9110	1363	684	21163	11038	47492	368100	12.90193
GR24	4718	619	871	1834	2269	10076	3169	23556	207900	11.33045
CZ08	11029	1780	2139	2289	3056	22369	19286	61948	551400	11.23468
CZ07	16566	1997	2507	5015	5106	3511	26697	61399	557700	11.00932
ES22	9209	1505	2215	1209	3231	3117	9234	29720	274100	10.84276
ITD5	59053	2987	6286	13193	40760	9567	65710	197556	1912200	10.33135
ES21	11586	2717	4350	4478	5925	20526	44553	94135	925300	10.17346
CZ04	8568	1452	2583	6910	11715	3167	16082	50477	503800	10.01925
AT34	4423	650	1162	325	988	597	9615	17760	181400	9.790518
ES23	4279	2575	503	664	1744	189	3533	13487	138400	9.744942

**Table 16 Bottom Regions in “Regional Employment in Industries with High Energy Spending”**

regions	C10	C11	C17	C20	C23	C24	C25	Employment in industries with high energy spending, 2009	Total employment, 2009	% employment in high energy spending, 2009
DE30	8418	1316	1092	2173	713	1391	5951	21054	1532300	1.37401
ES53	3635	1125	174	252	2270	48	3018	10522	475600	2.21236
NO01	5795	1954	231	1766	1084	441	2054	13325	591700	2.25199
UKH3	3352	1040	796	1771	2225	518	7958	17660	782000	2.25831
UKH2	2977	1095	722	2900	1743	1097	8466	19000	814800	2.33186
ES30	19081	2169	5912	6282	8894	3274	25870	71482	2889500	2.47385
ES70	8154	2355	547	591	3215	182	4558	19602	787300	2.48978
UKJ4	4379	485	3258	3209	1717	917	6262	20227	762000	2.65446
UKJ1	9565	652	1015	4190	1170	656	12346	29594	1111900	2.66157
BE10	4381	36	354	2665	1023	441	1744	10644	399800	2.66233

#### 4.2.5.2. @26: Regional Estimation of Greenhouse Emissions

The indicator shows the emissions of Greenhouse gases (GHG) expressed in CO<sub>2</sub>- equivalents. This indicator has been calculated using the method previously defined in the ESPON climate project<sup>75</sup>: It is assumed that regional GHG emissions follow the regional distribution of final energy consumption, which is approximated using population and GVA data available at regional levels. As national energy data are available by different consumption sectors, it is possible to allocate energy data to regions by using different allocation criteria for different sectors. These criteria are shown under *Calculations* below.

*Data used for develop the indicator:*

Data at national level:

- GHG data on all gases, sources excluding LULUCF (available at the UNFCCC Secretariat website)
- Final energy consumption in the following categories: industry sector, transport sector, residential, commercial and public services, agriculture/forestry, and non-energy use (available at EUROSTAT)

Data at Regional level (both datasets are available at EUROSTAT)

- Population
- GVA

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<sup>75</sup> Available at: <[http://www.espon.eu/main/Menu\\_Projects/Menu\\_AppliedResearch/climate.html](http://www.espon.eu/main/Menu_Projects/Menu_AppliedResearch/climate.html)> (Access 2012-2-28).

*Calculations:*

Regional GHG emissions:

$$\text{GHGr} = \text{GHG} * \text{FECr}/\text{FEC}$$

Regional final energy consumption:

$$\text{FECr} = \text{FEC}(\text{hh})\text{r} + \text{FEC}(\text{is})\text{r}$$

Regional final energy consumption of residential and transport sectors:

$$\text{FEC}(\text{hh})\text{r} = \text{FEC}(\text{hh}) * \text{POP}\text{r}/\text{POP}$$

Regional final energy consumption of the industry sector, commercial and public services, agriculture/forestry, and non-energy use:

$$\text{FEC}(\text{is})\text{r} = \text{FEC}(\text{is}) * \text{GVA}\text{r}/\text{GVA}$$

FEC = Final energy consumption on national level (total, all sectors combined)

FEC(hh) = Final energy consumption of residential and transport sectors on national level

FEC(is) = Final energy consumption of industry, commercial and public services, agriculture/forestry, and non-energy use on national level

GHG = emissions on national level

GVA = GVA on national level

POP = total population on national level

#### *4.2.5.3. @34: Labor Productivity*

This indicator has been calculated as the ratio of regional GDP in millions of Purchasing Power Standards (PPS) between the total number of employees and is represented as a percentage of EU-27 average (EU27=100). Both datasets (GDP and employment data) were directly downloaded from EUROSTAT webpage.

#### *4.2.5.4. @43: Relation Between Retirement Age and Life Expectancy*

In this case, SIESTA team has produced four indicators. This was due to three reasons: (i) life expectancy rates are obviously gender-based but also (ii) as some of the countries set the retirement age depending on gender. The third reason was (iii) that the official and real retirement age does not coincide. This way, our calculations derived in the following four indicators:

- Life expectancy at the official age of retirement (female) (map 5)
- Life expectancy at the effective age of retirement (female) (map 4)

- Life expectancy at the official age of retirement (male) (map 7)
- Life expectancy at the effective age of retirement (male) (map 6)

It has to be noted that: (i) there is no available dataset for the real retirement ages (instead of the official ones) for NUTS2/3 and these data are only available for state level.<sup>76</sup> These indicators express an estimation of years lived by of women and men after the official and the effective retirement respectively. They were calculated by subtracting the official or real age of retirement from the life expectancy at birth. Data of life expectancy at birth is defined by EUROSTAT as the average number of years that a newborn child can expect to live if subjected throughout his/her life to the current mortality conditions (age specific probabilities of dying).

The official age corresponds to the age at which a pension can be received irrespective of whether a worker has a long insurance record of years of contributions. These data were obtained from the OECD webpage where several Statistics on average effective age and official age of retirement in OECD countries are available. On other hand, the average effective retirement age for most of the EU27 was calculated by the OECD and can also be directly download from the OECD webpage. According to the OECD the average effective age of retirement is defined as the average age of leaving the labour force during a 5-year period. Labour force (net) exits are estimated by taking the difference in the participation rate for each 5-year age group (40 and over) at the beginning of the period and the rate for the corresponding age group aged 5-years older at the end of the period.

In brief, the data sources to build the indicators were the following:

(i) Life expectancy data were directly downloaded from the EUROSTAT statistics Database Web site:

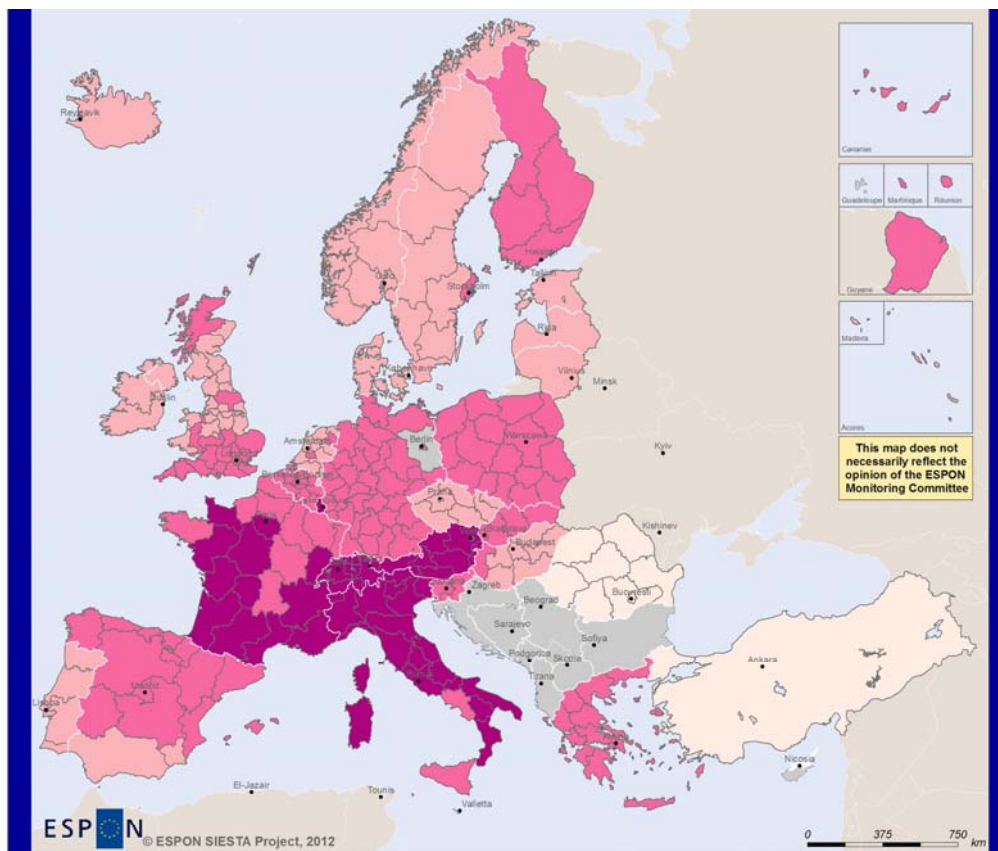
[http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search\\_database](http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database). Data for BA DATA were downloaded from the World Bank webpage.

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76 See statistics available at OECD website: [http://www.oecd.org/document/47/0,3746,en\\_2649\\_33927\\_39371887\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/47/0,3746,en_2649_33927_39371887_1_1_1_1,00.html) (Access 2011-11-20).

(ii) Real and official retirement ages were directly downloaded from the OECD web page: <http://www.oecd.org/els/employmentpoliciesanddata/ageingandemploymentpolicies-statisticsonaverageeffectiveageofretirement.htm>. Official retirement ages for Latvia and Lithuania were obtained in Romans, F. (2007): "The transition of women and men from work to retirement", Statistics in Focus, 97/2007. Available at: [http://epp.eurostat.ec.europa.eu/cache/ITY\\_OFFPUB/KS-SF-07-097/EN/KS-SF-07-097-EN.PDF](http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-07-097/EN/KS-SF-07-097-EN.PDF).

**Map 4 Female Life Expectancy at the Effective Age of Retirement, 2008**

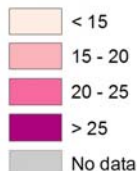


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Regional level: NUTS2 and NUTS0  
Source: EUROSTAT  
Origin of data: EUROSTAT, 2012.  
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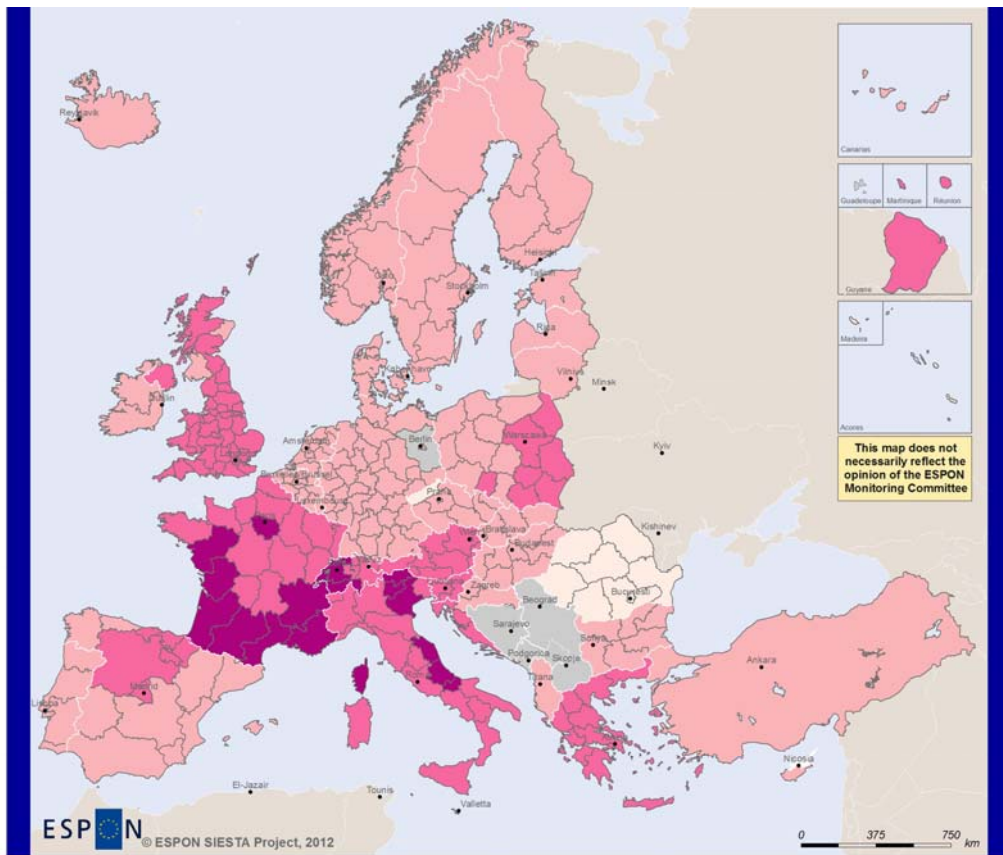
**Years alive after the effective retirement age, 2008.**



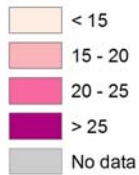
Notes:  
Average effective age of retirement 2004 - 2009: The average effective age of retirement is defined as the average age of exit from the labour force during a 5 year period. Labour force (net) exits are estimated by taking the difference in the participation rate of each 5 year age group (40 and over) at the beginning of the period and the rate for the corresponding age group aged 5 years older at the end of the period.

The official age corresponds to the age at which a pension can be received irrespective of whether a worker has a long insurance record of years of contributions. This data come from the OCDE with the exception of Latvia and Lithuania which data comes from EUROSTAT document "The transition of women and men from work to retirement".  
TR is shown at country level.

**Map 5 Female Life Expectancy at the Official Age of Retirement, 2008**



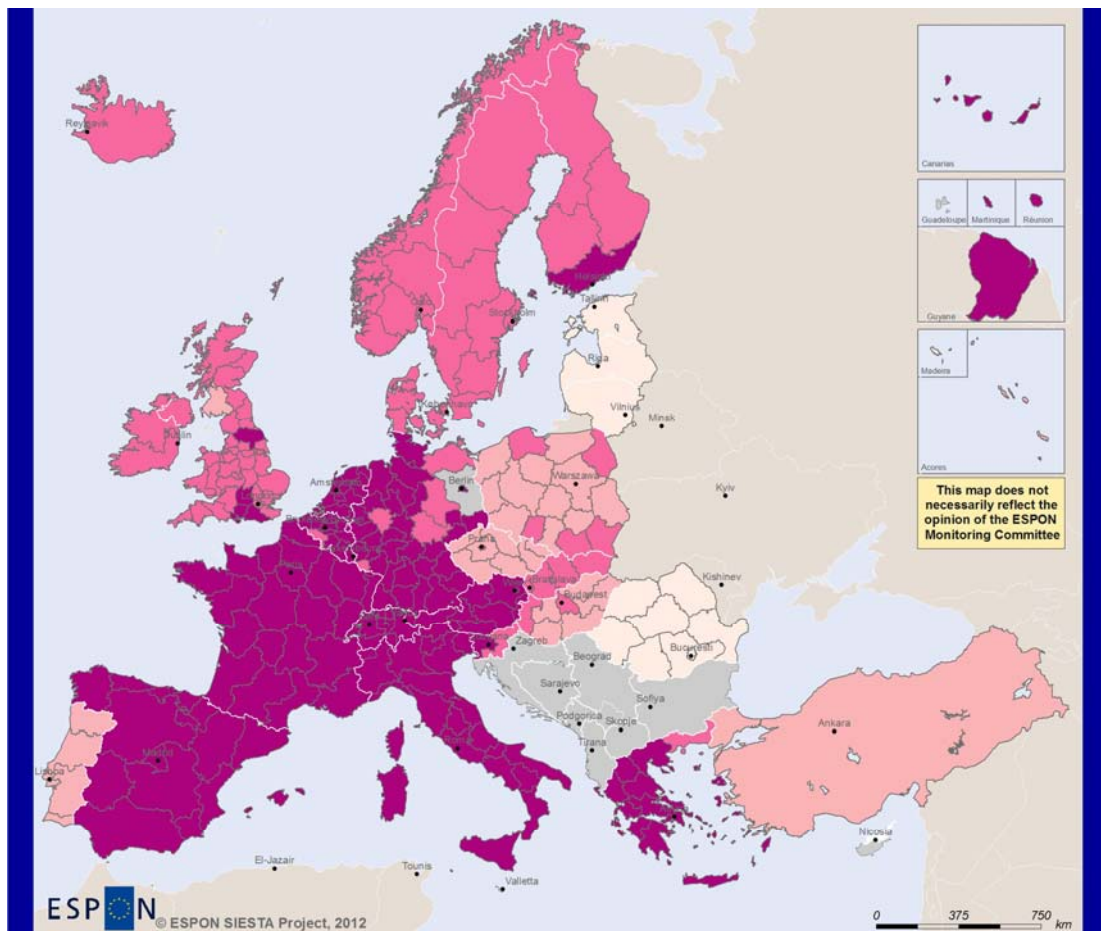
**Years alive after the official retirement age, 2008.**



Notes:  
Source average effective age of retirement: OECD  
Source life expectancy at birth: EUROSTAT  
TR and AL are shown at country level.



**Map 6 Male Life Expectancy at the Effective Age of Retirement, 2008**



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Regional level: NUTS2 and NUTS0  
Source: EUROSTAT  
Origin of data: EUROSTAT, 2011  
© EuroGeographics Association for administrative boundaries

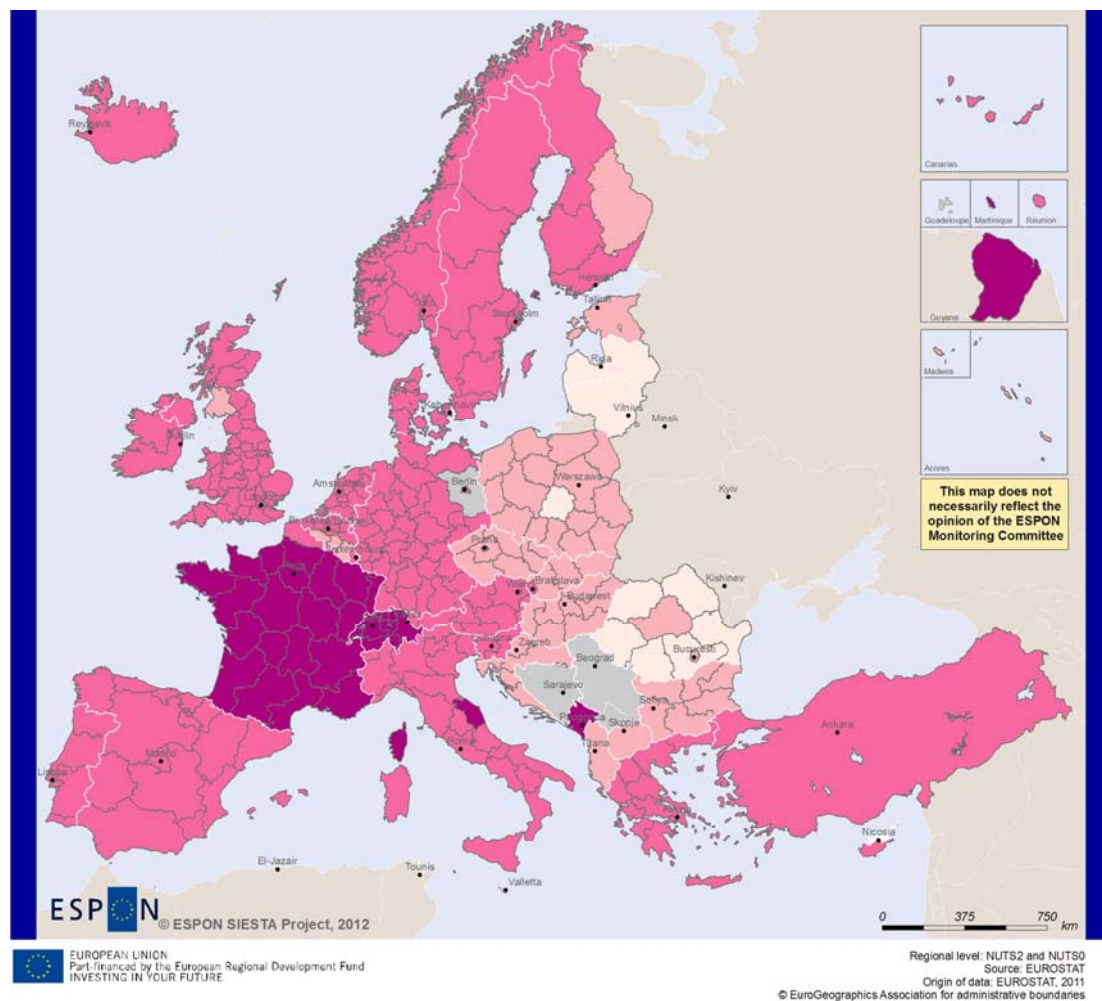
**Years alive after the effective retirement age, 2008.**



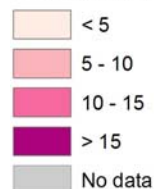
Notes:  
Average effective age of retirement 2004 - 2009. The average effective age of retirement is defined as the average age of exit from the labour force during a 5 year period. Labour force (net) exits are estimated by taking the difference in the participation rate of each 5 year age group (40 and over) at the beginning of the period and the rate for the corresponding age group aged 5 years older at the end of the period.

The official age corresponds to the age at which a pension can be received irrespective of whether a worker has a long insurance record of years of contributions. This data come from the OCDE with the exception of Latvia and Lithuania which data comes from EUROSTAT document "The transition of women and men from work to retirement".  
TR is shown at country level.

**Map 7 Male Life Expectancy at the Official Age of Retirement, 2008**



**Years alive after the official retirement age, 2008.**



Notes:  
 Source average effective age of retirement: OECD  
 Source life expectancy at birth: EUROSTAT  
 TR and AL are shown at country level.

*4.2.5.5. @46: People Working in the Public Sector*

In an early stage of SWS4, the Project Partners attempted to obtain @46 state by state. However, the evident definition differentiates about is considered to be a “public servant” across the European space making it impossible to put the obtained databases together. Indeed, as it is quite obvious, this is a particularly controversial issue in some countries. As reported by scholars, such as Glassner (2010),<sup>77</sup> the most realistic strategy in relation to this topic is to pragmatically use the EUROSTAT

77 Glassner, V. (2010): *The public sector in the crisis*. Brussels: European Trade Union Institute. Published as a working paper and available at: <<http://docs.jean-jaures.net/NL417/1-public-sector.pdf>> (Access 2012-2-14).

amalgamation of what is considered public sector. In the current EUROSTAT statistical framework, this is done through NACE Rev.2 (codes O-Q).

#### **4.2.6. A Note on the Envisaged Use of Previous ESPON Projects**

From the very beginning of the project the team of the project SIESTA have taken into account other projects developed under the ESPON programme. This is compulsory due to two main reasons: (i) the contents developed by other projects can be important for the elaboration of the Atlas contents and the policy recommendations and (ii) some projects have built indicators that could be included in the EU2020S Atlas. In relation to this second reason, the problem of using indicators developed under previous ESPON projects was that one of the requirements to choose indicators is that data must be recent and when possible allow for research trends and unfortunately not many indicators in ESPON DB 2013 meet the conditions as set out above.

While various Projects funded by ESPON are very useful, none of them specifically deals with the EU2020S, although this document is quoted in some of the recent ones (for instance, in INTERCO, KIT or METROBORDER). That means that most of the Projects considered here are only partially useful. Section 4.2.6.1 makes a systematic review of the most valuable projects and in this section a general assessment of them is given, especially in relation to the indicators that have been selected or discussed from them. In this respect, KIT, ReRisk, FOCI and ESPON CLIMATE have been highly valuable. INTERCO deserves particular attention in the sense that this project has intensively scanned data availability across the EU space and has proposed some particular indicators consistent with the EU2020S, logically coinciding with those used in SIESTA; INTERCO has also been important to note that previous ESPON projects are reporting the same data availability problems as SIESTA has found. In relation to research and innovation, KIT (Knowledge, Innovation and Territory) offers the number of effective research projects that has been developed across the EU space and FOCI (Future Orientation for Cities) introduces an indicator referencing the European FUAs involved in NBCI projects in order to measure the position of cities in innovative networks. The collaboration with KIT has also been very important in order to quickly obtain the databases, still not uploaded to ESPON 2013 DB. Apart from FOCI and KIT, GEOSPECS (European Perspective on Specific Types of Territories) has been important for the smart growth pillar.

With regard to sustainable growth, FOCI has also offered an indicator in relation to competitiveness and economic growth which shows the number

of headquarters of transnational firms in cities and which has been finally been selected (see point 4.2.2). In addition, ReRisk (Regions at Risk of Energy Poverty) explains the methodology for determining the employment in industries with high energy spending in its Final Report and this has been followed (see point 4.1.5.1) and two indicators on wind and energy potential developed by this project have also been incorporated through downloading from ESPON 2013 DB (see point 4.1.3). As reported in point 4.1.2.1, ESPON CLIMATE (Climate Change and Territorial Effects on Regions and Local Economies in Europe) provides a methodology to estimate the regional greenhouse gas emissions at NUTS3 level and our own calculation has used this procedure. Apart from these three ESPON projects, the following ones have been very relevant to screening on sustainable growth: EDORA (European Development Opportunities in Rural Areas), TRACC (Transport Accessibility at Regional and Local Scale and Patterns in Europe), DEMIFER (Demographic and Migratory Flows Affecting European Regions and Cities) and GREECO (Regional Potential for a Greener Economy).

With respect to the inclusive growth pillar, DEMIFER is relevant to SIESTA in terms of employment, skills and jobs because the project analyses working age population, impact of migration on population and the ageing demographic phenomenon in Europe. However, it is true that, after an intensive screening, no indicator has been found as useful for the SIESTA specific purposes. An upcoming project under Priority 1 on "Territorial dimension of poverty and social exclusion in Europe" could be of interest for SIESTA project in relation to this priority, but it is still not available. The same is applicable for the Project on "Territorial impact of the financial and economic crisis", with strong parallelisms with SIESTA. Both were launched in the Call opened in August 2011 and that means that SIESTA is going to finish before the first results will be delivered.

#### *4.2.6.1. Links of SIESTA with Previous and Ongoing ESPON Projects.*

This section attempts to develop the necessary connections of the SIESTA Project with other projects carried out within the ESPON Programme, both from the first round (ESPON 2006) and second round (ESPON 2013). Most of the reports written during the different ESPON Projects have been downloaded from the ESPON webpage<sup>78</sup> and carefully scrutinised and analysed with the objective of determining which of them is of interest for the SIESTA Project.<sup>79</sup> In this respect, this Annex D informs about the

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78 When applicable, the Final Report. If not, in decreasing order, the Draft Final Report, the Interim Report, the Inception Report and the Specification.

79 Subsequently to the elaboration of this Annex E, it has been published an Overview of Projects by ESPON CU (in November 2011). This document has been also checked.

milestone Projects from the SIESTA perspective. In order to do so, two pieces of information are presented herein in each section: (i) an executive abstract of the Project itself; and (ii) its significance for the SIESTA Project development. The analysis includes the revision of some indicators that were developed in the previous and ongoing projects that are of interest for SIESTA, and also the thematic considerations raised in these projects and their associated frameworks and methodologies.

### **FOCI**

Europe's largest cities and urban agglomerations are evaluated in this project in order to analyse their current state, trends and development perspectives. Therefore, the Project offers indicators regarding competitiveness, socio-economic cohesion, environmental situation and polycentricism among cities that fit with some SIESTA research priorities. Moreover, FOCI project maps the European urban reality revealing new typologies of the urban system and some relevant tables and maps (present in the Final Report) are extremely useful for SIESTA and have been downloaded through ESPON 2013 DB.

### **EDORA**

Rural Development is one of the objectives related to sustainable growth in terms of the SIESTA Project. In EDORA, rural development is basically understood as job creation and economic growth in rural areas. The Project provides some indicators that may be of interest to the SIESTA Project in relation to development opportunities, socio-economic situation, employment and competitiveness in rural areas.

### **ESPON Climate**

This project makes a vulnerability assessment of the climate change for all the EU regions, by identifying regional typologies. In addition, adaptation options are raised, coping with specific patterns of climate change. According to the methodological framework of the Project, anthropogenic greenhouse gas emissions contribute to global warming and thus to climate change. The climate change is characterised with the existing data and projections (for instance, in annual mean temperature or in annual mean precipitation) and also exposures to river floods or coastal storms are calculated for NUTS3. This leads to the elaboration of sensitivity to climate change maps, including those on potential impacts caused by several constitutive elements of climate change. An aggregate impact of climate change on Europe's regions is calculated; this could be an alternative for [122]=@31, but this index has finally been rejected for the SIESTA purposes as explained in point 3.1.2.3. Finally, the regional greenhouse emissions estimation is a reasonable point of departure for the SIESTA calculation of indicator [3]=@26 (see point 3.1.2.1). The last

part of the Final Report of ESPON Climate is devoted to policy-making issues.

### **ReRisk**

Energy prices, energy savings and the development of renewable energies are some of the issues contemplated in this project about regions at risk of energy poverty. On one hand, the Project focuses on new possibilities to support competitive and clean energy in Europe. On the other hand, the Project seeks to generate sustainable energy sources. Some ReRisk indicators are relevant for the SIESTA Project in relation to employment, industrial activity, energy and climate. For instance, ReRisk develops a methodology to consider employment in industries with high energy purchases in the EU regions ([161]=@23) and this has been used for SIESTA (see point 3.1.2.2). In relation to fighting poverty, ReRisk offers data on long term unemployment and disposable income in households, indicators that in the SIESTA Project are included in the priority block on inclusive growth.

### **TRACC**

This project aims to deliver results which can advise and improve the European policy development in transport and accessibility. It is understood that good accessibility and connectivity are relevant factors for economic activities, territorial development, competitiveness and cohesion. TRACC project offers a set of accessibility indicators (p. 13) and a map on the European road network (distinguishing between motorway, express roads, trunk roads and other roads) that could be of interest to the SIESTA project for a global accessibility analysis. SIESTA considers indicators in relation to mobility integrated in the Sustainable Growth priority and significant measures would be obtained from TRACC.

### **GEOSPECS**

GEOSPECS is asked to discover strengths, weakness and opportunities in different types of Europeans regions, taking into account a classification which distinguishes border areas, highly or sparsely populated areas, inner periphery, mountain areas, islands, coastal zones and outermost regions. In part, SIESTA Project will use a similar classification in the "analysis and elaboration of policy recommendations" (SWS8) borrowing ESPON region groups (see point 2.3.2). Territories with specific features could be integrated in new typologies of particular types of regions in Europe. Thus, the GEOSPECS Project characterises the region groups by considering a wide set of factors: demographic patterns, labour market and access to services, transport networks, education and training, natural resources, energy production, tourism opportunities, etc. Some of these aspects are taken into account in the SIESTA Project.

## **KIT**

This Project begins by analysing the current policy context to explore the territorial dimension of innovation and knowledge. Beyond this point, the current state, patterns and potentials of regions are considered in order to identify new opportunities for innovation and knowledge development. KIT coincides with some of the matters selected by SIESTA in relation to innovation, education and digital society. It has been very useful for discussing indicators in the pillar on smart growth, as extensively reported in section 4.1.

## **GREECO**

Some of the main results envisaged in this project are in relation to green economic activities and their potential. It seems to be useful to ask for particular information, although its Inception Report has still not been uploaded in the website (on 30/3/2012) and that means that it is not going to be considered by SIESTA.

## **KITKASP**

This is a project under Priority 2 to identify and disseminate good practice in the use of data, indicators and indices, as well as to select a set of key indicators to inform Cohesion Policy. The SIESTA Project could obtain some relevant data, indices, maps, recommendations, etc. if keeping in contact with KITCASP, although its deadline is in 2013.

## **ESPON 2013 DB**

This Project is developed in partnership with other projects from Priority 1 (TIPTAP, EDORA, DEMIFER, FOCI, and RERISK) and Priority 3 (Demography, Accessibility, Lisbon Indicators, Typology...). The Project has elaborated a substantial database (DB) on European regions and cities. This DB, available in the ESPON webpage, plays a major role in the promotion of ESPON network. This project tries to achieve the following aims, among others: (i) a very strict definition of rules concerning metadata and quality; (ii) the integration of various types of geographical objects; and (iii) the attempt to enlarge time series towards past and future. The ESPON 2013 DB Application, a complex information system dedicated to the management of statistical data about the European territory, spanning over a long period of time, has mainly been the applied result of the ESPON 2013 DB Project. This tool has been meticulously reviewed for the purposes of SIESTA, especially in order to download data from previous ESPON projects useful for SIESTA, as extensively reported in the section 4.1. In the future, SIESTA will upload its obtained data and metadata files to contribute to ESPON 2013 DB Project and to get a data harmonisation using the existing coding schemes. It has to be mentioned

that SIESTA's coding scheme has been elaborated in consistence with the ESPON 2013 DB Project to provide TPGs with a unique code.

### **INTERCO**

INTERCO is a project devoted to the development of indicators of territorial cohesion. Its main objective is to develop a set of indicators and indices that could be used to support policy makers in measuring and monitoring territorial cohesion related to European territorial development. From more than 600 potential indicators identified, the research process allowed the filtering and the prioritisation of 29 indicators organised in thematic groups, capturing key policy objectives of the aim of European territorial cohesion. It has to be said that the INTERCO team has taken into account the EU2020S in the definition of the indicators and 22 of the 32 indicators defined by them coincide with indicators using in SIESTA project. INTERCO has also highlighted that the indicators selected as suitable to overcome the issue of territorial cohesion are not available today at the required spatial level (i.e. NUTS3 or lower) and/or as sufficient time series; these problems are exactly the same as SIESTA has identified, as extensively reported in section 4.2, even quoting INTERCO for sustaining our conclusions in relation to data availability and quality.

As recommended by the ESPON CU SIESTA ESPON project has considered the indicators included in the first selection of ESPON Territorial Indicators developed by INTERCO. In section 4.2.7 it was specified for each indicator considered in the SIESTA project if they are included or not in the final list of INTERCO, if an indicator is included in the list of INTERCO then it is also specified in which group and category has been included.

### **Multi Dimensional Database Design and Development (M4D)**

This project is oriented to maintain consistency and further expand the ESPON 2013 Database and the results derived from INTERCO Project. The ESPON 2013 DB contributes to better understanding the current situation and past and future trends of different European regions. As soon as M4D integrates data on cities into the ESPON DB, SIESTA will consider the new database developed by M4D.

### **DEMIFER**

This project analyses the regional effects of migration on the European demographic future. Some of the issues mentioned in this project could be relevant for SIESTA, especially for analysis purposes. For example, in regards to inclusive growth the document shows several indicators linked with employment and skills. Thus, it is possible to find data about the impact of migration on population and labour force and the annual change



in working age population. Closely related to the indicators selected by SIESTA, the DEMIFER Project provides data and maps showing the ageing of Europe, a substantial issue in the inclusive growth agenda.

### **CAEE and METROBORDER**

The Case of Agglomeration Economies in Europe (CAEE) and Cross-border Polycentric Metropolitan Regions (METROBORDER) are projects under Priority 2. The first one examines the relationship between agglomeration economies and city/regional and metropolitan governance, whereas the second explains how cross-border polycentric metropolitan regions constitute a new phenomenon of European spatial organisation which have development potentials and opportunities. Some references as cross-border commuters in metropolitan areas, number of public transport connection between the main cities and high-technology manufacturing and knowledge-intensive service sectors could be of interest to the SIESTA Project when analysing.

### **Upcoming Projects**

“Territorial dimension of poverty and social exclusion in Europe” and “Territorial impact of the financial and economic crisis” are two upcoming projects under Priority 1 that might be of interest for SIESTA. The former is in relation to poverty and social exclusion as one of the EU2020 flagship initiatives. In this way, it could be relevant for the SIESTA Project because poverty is a central issue within it, under the inclusive growth pillar. The latter aims to analyse the global financial crisis, thus allowing for the delivery of strategic policy recommendations and messages. It is of interest to SIESTA as arguments are shared: whilst SIESTA is focused on the Strategy for coming out of the crisis, this forthcoming Project is going to be devoted to the crisis itself. However, still no progress on them is available.

#### 4.2.7. Systematic List of Indicators and Maps for the Atlas

This section includes one table for each of the indicators of the final list (see section 4.1.3.1). The tables show information on the geographical scale, year, methodology and if the indicators have been proposed by INTERCO project or not. Tables of indicators have been ranked according to the sections of the final Atlas in which they are included. As mentioned before, some indicators in the final list were not included in the Atlas as maps; however, since they have all been used to produce the contents, in this section the overall 81 indicators are shown. Each table specifies whether the indicator was included in the Atlas and the number that it has within. As suggested by ESPON CU (see section 8.3 of this report for more information in this respect) 26 maps have been removed from the preliminary version of the Atlas submitted in early August 2012; due to this map reduction, each table also specifies if the map has been removed in the final version of the Atlas. To sum up, each map includes three number references: the number of the map in the definitive list of maps (DLM), the number of the map in the Draft Final Report Atlas text (DFR) and the number of the map in the Final Report Atlas text (FR).

##### 4.2.7.1. Economic Growth and Competitiveness

<p><b>Indicator Name: Growth measured as GDP per capita in PPS</b></p> <p><b>DLM: Map 26/DFR: Map 2.1/FR: Map 2.1</b></p>
<p><b>EU headline target:</b> No.</p>
<p><b>ESPON Territorial Indicator:</b> Yes.</p>
<p><b>Theme/Category:</b> Economic performance and competitiveness/Context.</p>
<p><b>Proposed by:</b> INTERCO Project.</p>
<p><b>Priority/ATLAS Subsection:</b> Sustainable Growth/Competitiveness and economic growth.</p>
<p><b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no</p>
<p><b>Definition:</b> Gross Domestic Product (GDP) expressed in Purchasing Power Standards (PPS) per inhabitant in percentage of the EU-27 average.</p> <p>GDP is an indicator of the output of a country or a region. It reflects the total value of all goods and services produced minus the value of goods and services used for intermediate consumption in their production. Expressing GDP in PPS eliminates differences in price levels between countries. Calculations on a per inhabitant basis allow for the comparison of economies and regions significantly different in absolute size. The volume index of GDP per capita in Purchasing Power Standards (PPS) is expressed in relation to the European Union (EU-27) average set to equal 100. If the index of a country is higher than 100, this country's level of GDP per head is higher than the EU average and vice versa.</p>
<p>Unit: PPS per inhabitant in percentage of the EU-27 average.</p>
<p><b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a>.</p>
<p><b>Year:</b> 2009, except ES and TR that are shown for 2008.</p>
<p><b>NUTS level:</b> NUTS 3, except that TR is only available at NUTS 2 level. IS, CH and NO are only available at country level</p>
<p><b>Gaps:</b> Gaps in this indicator are related to:</p> <p>(i) Data are not available for AL, BA, XK, RS and ME.</p>

<b>Indicator Name: Growth measured as GDP per capita in PPS in LUZ</b>
<b>DLM: Map 27/ DFR: Map 2.2</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Economic performance and competitiveness/Context.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Competitiveness and economic growth.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> <b>yes</b> <input type="checkbox"/> <b>no</b>
<b>Definition:</b> Gross Domestic Product (GDP) expressed in Purchasing Power Standards (PPS) per inhabitant in URBAN AUDIT cities.  GDP is an indicator of the output of a country or a region. It reflects the total value of all goods and services produced minus the value of goods and services used for intermediate consumption in their production. Expressing GDP in PPS eliminates differences in price levels between countries. Calculations on a per inhabitant basis allow for the comparison of economies and regions significantly different in absolute size.  Urban Audit defines Larger Urban Zone (Label "LUZ") as an approximation of the functional urban zone centred around the town/ city.
Unit: PPS per inhabitant.
<b>Source:</b> EUROSTAT - URBAN AUDIT. Data were directly downloaded from the EUROSTAT statistics Database Web site <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2007.
<b>Territorial Unit:</b> LUZ.
<b>Gaps:</b> Gaps in this indicator are related to:  i) Data are not available for CH, NO, TR and HR.

<b>Indicator Name: Growth measured as GDP variation, 2000-2008</b>
<b>DLM: Map28</b>
<b>EU headline target:</b> No.
<b>ESPO Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Economic performance and competitiveness/Context.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Competitiveness and economic growth.
<b>The indicator was included in the Final Atlas:</b> <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
<b>Definition:</b> Variation in Gross Domestic Product expressed in Purchasing Power Standards (PPS) between 2000 and 2008.  GDP is an indicator of the output of a country or a region. It reflects the total value of all goods and services produced minus the value of goods and services used for intermediate consumption in their production. Expressing GDP in PPS eliminates differences in price levels between countries. Calculations on a per inhabitant basis allow for the comparison of economies and regions significantly different in absolute size. GDP per inhabitant in PPS is the key variable for determining the eligibility of NUTS 2 regions in the framework of the European Union's structural policy.  The indicator has been calculated as the percentage of change in 2008 with respect to 2000.
Unit: Percentage of change.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2008 compared to 2000 with the exception of DK, which is the 1999-2009 variation and ES and TR that are 2000-2008.
<b>NUTS level:</b> NUTS 3. TR is available at NUTS 2 level. IS, CH and NO are available at country level.
<b>Gaps:</b> Gaps in this indicator are related to:  (i) Data are not available for AL, BA, XK, RS and ME.

<b>Indicator Name: Growth measured as GDP variation, 2000-2009</b>
<b>DLM: Map28/ DFR: Map 2.3/FR: Map 2.2</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Economic performance and competitiveness/Context.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Competitiveness and economic growth.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
The map included in the Atlas was designed to show those regions that have improved its situation with respect to EU27 average in the period 2000-2009.
<b>Definition:</b> Gross Domestic Product is expressed in Purchasing Power Standards (PPS) as EU27=100 GDP is an indicator of the output of a country or a region. It reflects the total value of all goods and services produced minus the value of goods and services used for intermediate consumption in their production. Expressing GDP in PPS eliminates differences in price levels between countries. Calculations on a per inhabitant basis allow for the comparison of economies and regions significantly different in absolute size. GDP per inhabitant in PPS is the key variable for determining the eligibility of NUTS 2 regions in the framework of the European Union's structural policy.
<b>The map elaborated with this dataset shows the improvement or worsening of the EU regions (NUTS 3) between the years 2000 and 2008 in relation to the GDP EU27 average. The map follows the same logic as the map 1.6 Change in regional GDP per head (PPS), 1995-2007 included on page 15 of the Fifth report on economic, social and territorial cohesion</b>
Unit: index EU27=100
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> The map shows the period 2000-2009 with the exception of DK which data are for 1999-2009.
<b>NUTS level:</b> NUTS 3. ES only available at NUTS 2 level.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for the following countries NO, HR, IS, TR, MK, AL, BA, XK, RS and ME.</li> <li>(ii) Data are not available for the following UK NUTS 3 regions UKM62, UKM650.</li> </ul>

<b>Indicator Name: Change in GDP per capita during the years of crisis, 2007-2011</b>
<b>DLM: Map29/DFR: Map 2.4/FR: Map 2.3</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Economic performance and competitiveness/Context.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Competitiveness and economic growth.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> Gross Domestic Product (GDP) is expressed in Purchasing Power Standards (PPS). GDP is an indicator of the output of a country or a region. It reflects the total value of all goods and services produced minus the value of goods and services used for intermediate consumption in their production. Expressing GDP in PPS eliminates differences in price levels between countries. Calculations on a per inhabitant basis allow for the comparison of economies and regions significantly different in absolute size. GDP per inhabitant in PPS is the key variable for determining the eligibility of NUTS 2 regions in the framework of the European Union's structural policy.
<b>The indicator shows GDP variation as percentage of change: 2011 compared to 2007.</b>
Unit: Percentage of change.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2011 compared to 2007. Percentage of change for BG, IE, PL, RO, HR, MK and TR is 2007-2010, because data for 2011 is not available.
<b>NUTS level:</b> Country level.
<b>Gaps:</b> Gaps in this indicator are related to: (i) Data are not available for AL, BA, XK, RS and ME.

<b>Indicator Name: Labour productivity</b>
<b>DLM: Map 30/DFR: Map 2.7/FR: Map 2.4</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Economic performance and competitiveness/Context.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/ Competitiveness and economic growth.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> Labour productivity per person employed. This indicator is the ratio of regional GDP in millions of Purchasing Power Standards (PPS) among the total number of employees.
Unit: Percentage of EU-27 average.
<b>Source:</b> SIESTA calculation using GDP and employment data from EUROSTAT. Both datasets were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a>
<b>Year:</b> 2008.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to: (i) Data are not available for AL, BA, XK, RS and ME.

<b>Indicator Name: Contribution of high-technology industries to the manufacturing trade balance</b> <b>DLM: Map 31/DRF: Map 2.8/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Competitiveness and economic growth.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the contribution of high-technology industries to the manufacturing trade balance.  Manufacturing trade balance reveals an economy's structural strengths and weaknesses in terms of technological intensity. It indicates whether an industry performs relatively better (or worse) than total manufacturing and can be interpreted as an indicator of revealed comparative advantage that is based on countries' trade specialisation.
Unit: Percentage of manufacturing trade.
<b>Source:</b> Organisation for Economic Co-operation and Development (OECD). Data were directly downloaded from the OECD statistics webpage: <a href="http://stats.oecd.org/">http://stats.oecd.org/</a>
<b>Year:</b> 2007.
<b>NUTS level:</b> Country level.
<b>Gaps:</b> Gaps in this indicator are related to:  (i) Data are not available for SI, CY, RO, BG, LT, LV, HR, MK, AL, BA, XK, RS and ME.

<b>Indicator Name: Variation in the contribution of high-technology industries to the trade balance, 1997-2007</b> <b>DFR: Map 2.9/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Competitiveness and economic growth.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the change in the contribution of high-technology industries to the manufacturing trade balance in 2007 compared to 1997.  Manufacturing trade balance reveals an economy's structural strengths and weaknesses in terms of technological intensity. It indicates whether an industry performs relatively better (or worse) than total manufacturing and can be interpreted as an indicator of revealed comparative advantage that is based on countries' trade specialisation.
Unit: Percentage points difference.
<b>Source:</b> Own elaboration from Organisation for Economic Co-operation and Development (OECD). downloaded from the OECD statistics webpage: <a href="http://stats.oecd.org/">http://stats.oecd.org/</a>
<b>Year:</b> 2007 compared to 1997.
<b>Territorial Unit:</b> Country level.

<b>Indicator Name: Number of headquarters of transnational firms in LUZ, 2005</b>
<b>DLM: Map 32/DFR: Map 2.10/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Competitiveness and economic growth.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> <b>yes</b> <input type="checkbox"/> <b>no</b>
<b>Definition:</b> Number of headquarters of transnational companies in the 2000 world's biggest companies whose headquarters are in Large Urban Zones (LUZ).
Unit: Number of headquarters of transnational firms.
<b>Source:</b> FOCI Project. Data were directly downloaded from ESPON 2013 Database: <a href="http://database.espon.eu/data">http://database.espon.eu/data</a>
<b>Year:</b> 2005.
<b>Territorial Unit:</b> LUZ. Urban Audit defines Larger Urban Zone (Label "LUZ") as an approximation of the functional urban zone centred around the town/ city.

<b>Indicator Name: Green technology patent applications to the EPO</b>
<b>Map 33</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Competitiveness and economic growth.
<b>The indicator was included in the Final Atlas:</b> <input type="checkbox"/> <b>yes</b> <input checked="" type="checkbox"/> <b>no</b>
<b>Definition:</b> The indicator shows the share of green technology patents of total number of patent applications to the EPO by inventor's country of residence. Patents considered as green technologies are the number of patent applications to the EPO according to a standard IPC (International Patent Classifications) in the following categories preselected by the OECD: General Environmental management and Energy generation from renewable and non-fossil sources.
Unit: Percentage of total patent applications.
<b>Source:</b> SIESTA calculations using data from OECD REGPAT database. Data were directly downloaded from the OECD statistics webpage: <a href="http://stats.oecd.org/">http://stats.oecd.org/</a>
<b>Year:</b> 2008.
<b>NUTS level:</b> NUTS 3. NL and EL are only available at NUTS 2 level.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for MK, AL, BA, XK, RS and ME.</li> </ul>



<b>Indicator Name: General government gross debt</b>
<b>DLM: Map 34/DFR: Map 2.5/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Competitiveness and economic growth.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the general government gross debt expressed as a percentage of GDP.  General government gross debt is defined in the Maastricht Treaty as consolidated general government gross debt at nominal value, outstanding at the end of the year in the following categories of government liabilities (as defined in ESA95): currency and deposits (AF.2), securities other than shares excluding financial derivatives (AF.3, excluding AF.34), and loans (AF.4). The general government sector comprises the sub-sectors of central government, state government, local government and social security funds.  GDP used as a denominator is the gross domestic product at current market prices. Data expressed in national currency are converted into euro using year-end exchange rates provided by the European Central Bank.
Unit: Percentage of GDP.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2011.
<b>NUTS level:</b> Country level.
<b>Gaps:</b> Gaps in this indicator are related to:  (i) Data are not available for CH, TR, NO, IS, HR, MK, AL, BA, XK, RS and ME.

<b>Indicator Name: General government gross debt change in the crisis years 2007-2011</b>
<b>DLM: Map 35/DFR: Map 2.6/ FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Competitiveness and economic growth.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The general government gross debt is expressed as a percentage of GDP and in millions of euro. It is defined in the Maastricht Treaty as consolidated general government gross debt at nominal value, outstanding at the end of the year in the following categories of government liabilities (as defined in ESA95): currency and deposits (AF.2), securities other than shares excluding financial derivatives (AF.3, excluding AF.34), and loans (AF.4). The general government sector comprises the sub-sectors of central government, state government, local government and social security funds.  GDP used as a denominator is the gross domestic product at current market prices. Data expressed in national currency are converted into euro using year-end exchange rates provided by the European Central Bank.
<b>The indicator shows the percentage of change for 2011 compared to 2007.</b>
Unit: Percentage of change.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2011 compared to 2007.
<b>NUTS level:</b> Country level.
<b>Gaps:</b> Gaps in this indicator are related to:  (i) Data are not available for CH, TR, NO, IS, HR, MK, AL, BA, XK, RS and ME.

#### 4.2.7.2. Green Economy, Climate Change and Energy

<b>Indicator Name: Regional estimation of Greenhouse gas emissions</b>
<b>DLM: Map 36/DFR: Map2.22/FR: Map 2.14</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Green economy, climate change and energy.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the emissions of Greenhouse gases (GHG) expressed in CO <sub>2</sub> -equivalents.  This indicator has been calculated using the method previously defined in the ESPON climate project: It is assumed that regional GHG emissions follow the regional distribution of final energy consumption, which is approximated using population and GVA data available at regional levels. As national energy data are available by different consumption sectors, it is possible to allocate energy data to regions by using different allocation criteria for different sectors. These criteria are shown under <i>Calculations</i> below.
<b>Data used for develop the indicator:</b> National level: <ul style="list-style-type: none"> <li>· GHG data on all gases, sources excluding LULUCF (available at the UNFCCC Secretariat website)</li> <li>· Final energy consumption in the following categories: industry sector, transport sector, residential, commercial and public services, agriculture/forestry, and non-energy use (available at EUROSTAT)</li> </ul> Regional level (both datasets were available from Eurostat): <ul style="list-style-type: none"> <li>· Population</li> <li>· GVA</li> </ul>
<b>Calculations:</b> Regional GHG emissions: $GHGr = GHG * FECr/FEC$ Regional final energy consumption: $FECr = FEC(hh)r + FEC(is)r$ Regional final energy consumption of residential and transport sectors: $FEC(hh)r = FEC(hh)r = FEC(hh) * POPr/POP$ Regional final energy consumption of the industry sector, commercial and public services, agriculture/forestry, and non-energy use: $FEC(is)r = FEC(is) * GVAr/GVA$ FEC = Final energy consumption on national level (total, all sectors combined) FEC(hh) = Final energy consumption of residential and transport sectors on national level FEC(is) = Final energy consumption of industry, commercial and public services, agriculture/forestry, and non-energy use on national level GHG = emissions on national level GVA = GVA on national level POP = total population on national level
<b>Unit:</b> CO <sub>2</sub> -equivalents.
<b>Source:</b> Derived from UNFCCC GHG data at national level and allocated to NUTS3 areas in relation to the population and the gross valued added downloaded from EUROSTAT. GHG data were directly downloaded from the UNFCCC website: <a href="http://unfccc.int/ghg_data/ghg_data_unfccc/time_series_annex_i/items/3841.php">http://unfccc.int/ghg_data/ghg_data_unfccc/time_series_annex_i/items/3841.php</a> . GVA and population datasets were directly downloaded from EUROSTAT web page: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a>
<b>Year:</b> 2008, except data for IT that are shown for 2007.
<b>NUTS level:</b> NUTS 3, except TR that is available at NUTS 2 level.
<b>Gaps:</b> Gaps in this indicator are related to:  (i) Data are not available for NO, CH, IS, AL, BA, XK, RS, ME and MK.

<b>Indicator Name: Greenhouse gas emissions, base year 1990</b>
<b>DLM: Map 37/DFR: Map 2.19/FR: 2.12</b>
<b>EU headline target:</b> Yes (a reduction of a 20%, compared to 1990 levels).
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Green economy, climate change and energy.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> This indicator shows trends in total man-made emissions of the 'Kyoto basket' of greenhouse gases for 2009 in relation to 1990 emissions. The 'Kyoto basket' of greenhouse gases includes: carbon dioxide (CO <sub>2</sub> ), methane (CH <sub>4</sub> ), nitrous oxide (N <sub>2</sub> O), and the so-called F-gases (hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride (SF <sub>6</sub> )). These gases are aggregated into a single unit using gas-specific global warming potential (GWP) factors. The aggregated greenhouse gas emissions are expressed in units of CO <sub>2</sub> equivalents. The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF); nor does it include emissions from international aviation and international maritime transport. CO <sub>2</sub> emissions from biomass with energy recovery are reported as a Memorandum item according to UNFCCC Guidelines and not included in national greenhouse gas totals. The EU as a whole is committed to achieving at least a 20% reduction of its greenhouse gas emissions by 2020 compared to 1990. This objective implies: - a 21 % reduction in emissions from sectors covered by the EU ETS (emission trading scheme) compared to 2005 by 2020; - a reduction of 10 % in emissions for sectors outside the EU ETS. To achieve this 10% overall target each Member State has agreed to country-specific greenhouse gas emission limits for 2020 compared to 2005 (Council Decision 2009/406/EC).
<b>Unit:</b> Index 1990=100.
<b>Source:</b> EEA. Data were directly downloaded from the EEA webpage: <a href="http://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer">http://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer</a>
<b>Year:</b> 2009.
<b>NUTS level:</b> Country level.

<b>Indicator Name: Variation of Greenhouse gas emissions compared to 1990 level</b>
<b>DFR: Map 2.20/FR: not included</b>
<b>EU headline target:</b> No
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Green economy, climate change and energy.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> This indicator shows trends in total man-made emissions of the 'Kyoto basket' of greenhouse gases for 2008 in relation to 1990 emissions.  The 'Kyoto basket' of greenhouse gases includes: carbon dioxide (CO <sub>2</sub> ), methane (CH <sub>4</sub> ), nitrous oxide (N <sub>2</sub> O), and the so-called F-gases (hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride (SF <sub>6</sub> )). These gases are aggregated into a single unit using gas-specific global warming potential (GWP) factors. The aggregated greenhouse gas emissions are expressed in units of CO <sub>2</sub> equivalents. The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF); nor does it include emissions from international aviation and international maritime transport. CO <sub>2</sub> emissions from biomass with energy recovery are reported as a Memorandum item according to UNFCCC Guidelines and not included in national greenhouse gas totals.  The EU as a whole is committed to achieving at least a 20% reduction of its greenhouse gas emissions by 2020 compared to 1990. This objective implies: - a 21 % reduction in emissions from sectors covered by the EU ETS (emission trading scheme) compared to 2005 by 2020; - a reduction of 10 % in emissions for sectors outside the EU ETS. To achieve this 10% overall target each Member State has agreed to country-specific greenhouse gas emission limits for 2020 compared to 2005 (Council Decision 2009/406/EC).
<b>Unit:</b> Index 1990=100.
<b>Source:</b> United Nations. Framework Convention on Climate Change. GHG total excluding LULUCF: Total CO <sub>2</sub> Equivalent Emissions without Land Use, Land-Use Change and Forestry <a href="http://unfccc.int/ghg_data/ghg_data_unfccc/time_series_annex_i/items/3814.php">http://unfccc.int/ghg_data/ghg_data_unfccc/time_series_annex_i/items/3814.php</a>
<b>Year:</b> 2008.
<b>Territorial Unit:</b> Country level.

<b>Indicator Name: Distance to national 2020 targets in GHG emissions outside the Emission Trading Scheme</b>
<b>DLM: Map 38/DFR: Map 2.21/FR:2.13</b>
<b>EU headline target:</b> Yes (-10%, compared to 2005 levels).
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Green economy, climate change and energy.
<b>Definition:</b> The indicator shows the difference in the greenhouse gas emission limits included in the 'Effort Sharing Decision' by 2020 compared to 2005 (Change with respect to 2005 levels, %). The EU as a whole is committed to achieving at least a 20% reduction of its greenhouse gas emissions by 2020 compared to 1990. This objective implies: - a 21 % reduction in emissions from sectors covered by the EU ETS (emission trading scheme) compared to 2005 by 2020; - a reduction of 10 % in emissions for sectors outside the EU ETS. To achieve this 10% overall target each Member State has agreed to country-specific greenhouse gas emission limits for 2020 compared to 2005 (Council Decision 2009/406/EC). The GHG emissions outside the EU ETS include the following sectors: transport, buildings, agriculture and waste.
<b>Unit:</b> Percentage points difference.
<b>Source:</b> Calculations have been developed by the European Commission and are included in the Seventh report on economic, social and territorial cohesion shows regions' and cities' contribution to Europe 2020. URL: <a href="http://ec.europa.eu/regional_policy/newsroom/detail.cfm?id=151">http://ec.europa.eu/regional_policy/newsroom/detail.cfm?id=151</a>
<b>Year:</b> 2009 (respect to 2005)
<b>NUTS level:</b> Country level.
<b>Gaps:</b> Gaps in this indicator are related to:  (i) Data are not available for TR, NO, CH, IS, HR, AL, BA, XK, RS, ME and MK.

<b>Indicator Name: Share of renewable energy in gross final energy consumption</b>
<b>DLM: Map 39/DFR: Map 2.11/FR: Map 2.5</b>
<b>EU headline target:</b> Yes (to increase a 20%).
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Green economy, climate change and energy.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> This indicator shows the share of renewable energy in the gross final energy consumption.  It is calculated on the basis of energy statistics covered by the Energy Statistics Regulation. It may be considered an estimate of the indicator described in Directive 2009/28/EC, as the statistical system for some renewable energy technologies is not yet fully developed to meet the requirements of this Directive. However, the contribution of these technologies is rather marginal for the time being. More information about the renewable energy shares calculation methodology and Eurostat's annual energy statistics can be found in the Renewable Energy Directive 2009/28/EC, the Energy Statistics Regulation 1099/2008 and in DG ENERGY transparency platform <a href="http://ec.europa.eu/energy/renewables/index_en.htm">http://ec.europa.eu/energy/renewables/index_en.htm</a> .
<b>Unit:</b> Percentage of gross final energy consumption.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2009.
<b>NUTS level:</b> Country level.
<b>Gaps:</b> Gaps in this indicator are related to:  (i) Data are not available for TR, EL, CH, IS, HR, AL, BA, XK, RS, ME and MK.

<b>Indicator Name: Share of renewable energy in gross final energy consumption. Distance to national 2020 target</b>
<b>DLM: Map 40/DFR: Map 2.12/FR: Map 2.6</b>
<b>EU headline target:</b> Yes (20%).
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Green economy, climate change and energy.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The share of renewable energy in the gross final energy consumption is calculated on the basis of energy statistics covered by the Energy Statistics Regulation. It may be considered an estimate of the indicator described in Directive 2009/28/EC, as the statistical system for some renewable energy technologies is not yet fully developed to meet the requirements of this Directive. However, the contribution of these technologies is rather marginal for the time being. More information about the renewable energy shares calculation methodology and Eurostat's annual energy statistics can be found in the Renewable Energy Directive 2009/28/EC, the Energy Statistics Regulation 1099/2008 and in DG ENERGY transparency platform <a href="http://ec.europa.eu/energy/renewables/index_en.htm">http://ec.europa.eu/energy/renewables/index_en.htm</a> .  <b>The indicator shows the difference between each country value in 2009 and the respective EU 2020 national target.</b>
<b>Unit:</b> Percentage points difference.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2009.
<b>NUTS level:</b> Country level.
<b>Gaps:</b> Gaps in this indicator are related to:  (i) Data are not available for NO, TR, EL, CH, IS, HR, AL, BA, XK, RS, ME and MK.

<b>Indicator Name: Wind energy potential</b>
<b>DLM: Map 41/DFR: Map 2.13/FR: Map 2.7</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Environmental qualities/Structure.
<b>Proposed by:</b> ESPON stakeholders.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Green economy, climate change and energy.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> This dataset shows the highest potential for producing electricity from on-shore wind power. However, the European Environmental Agency [EEA 2009] has introduced some restrictions when calculating the maximum potential, mainly due to environmental reasons. ReRisk project has followed these recommendations, using the "restrained" wind potential for the regional analysis.
<b>Unit:</b> Meters/second.
<b>Source:</b> ESPON 2013DB - ReRisk project. Data were directly downloaded from ESPON 2013 Database: <a href="http://database.espon.eu/data">http://database.espon.eu/data</a>
<b>Year:</b> 2005.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for TR, IS, HR, AL, BA, XK, RS, ME and MK.</li> <li>(ii) Data are not available for the following French regions: FR91, FR92, FR93, and FR94.</li> </ul>

<b>Indicator Name: Solar energy potential</b>
<b>DLM: Map 42/DFR: Map 2.14/FR: Map 2.8</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Green economy, climate change and energy.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the potential for electricity production from PV panels. Data refer to the yearly total yield of estimated solar electricity generation (for horizontal, vertical, optimally-inclined planes) in kWh within the built environment. These types of installations will be the first to become competitive at end-use level with electricity obtained from the central grid, with estimates from the International Energy Agency [IEA 2010] pointing to 2020 as break-even point in the regions with the highest PV potential.
<b>Unit:</b> kwh.
<b>Source:</b> ESPON 2013DB - ReRisk project. Data were directly downloaded from ESPON 2013 Database: <a href="http://database.espon.eu/data">http://database.espon.eu/data</a>
<b>Year:</b> 2005.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for DK, EE, LT, LV, SI, TR, IS, HR, AL, BA, XK, RS, ME and MK.</li> <li>(ii) Data are not available for the following French regions: FR91, FR92, FR93, and FR94.</li> </ul>

<b>Indicator Name: Energy intensity of the economy</b>
<b>DLM: Map 43/DFR: Map 2.15/FR: Map 2.9</b>
<b>EU headline target:</b> Yes (EU 2020 target is to improve energy efficiency 20 % which means a reduction of 368 MToe in the Gross inland energy consumption)
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Green economy, climate change and energy.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> This indicator is the ratio between the gross inland consumption of energy and the gross domestic product (GDP) for a given calendar year. It measures the energy consumption of an economy and its overall energy efficiency. The gross inland consumption of energy is calculated as the sum of the gross inland consumption of five energy types: coal, electricity, oil, natural gas and renewable energy sources. The GDP figures are taken at chain linked volumes with reference year 2000. Since gross inland consumption is measured in kgoe (kilogram of oil equivalent) and GDP in 1000 EUR, this ratio is measured in kgoe per 1 000 EUR.  This is a provisional indicator to express energy efficiency in the framework of the EU2020S.  The EU headline target is to improve the energy efficiency 20%, i.e. a reduction of energy consumption of 368 Mtoe (million tonnes of oil equivalent).
<b>Unit:</b> kgoe/1000 EUR.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database..">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database..</a>
<b>Year:</b> 2010.
<b>NUTS level:</b> Country level.
<b>Gaps:</b> Gaps in this indicator are related to:  (i) Data are not available for IS, AL, BA, XK, RS, ME and MK.

<b>Indicator Name: Energy intensity of the economy. Distance to national target</b>
<b>DLM: Map 44/DFR: Map 2.16/FR: Map 2.10</b>
<b>EU headline target:</b> Yes (EU 2020 target is to improve energy efficiency 20 % which means a reduction of 368 MToe in the Gross inland energy consumption)
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Green economy, climate change and energy.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> Distance to the national target in energy efficiency has been calculated using data of Gross inland energy consumption that is available at country level at the EUROSTAT webpage. ( <a href="http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&amp;init=1&amp;plugin=1&amp;language=en&amp;pcode=tsdcc320">http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&amp;init=1&amp;plugin=1&amp;language=en&amp;pcode=tsdcc320</a> ). Gross inland consumption is calculated as follows: primary production + recovered products + total imports + variations of stocks - total exports - bunkers. It corresponds to the addition of final consumption, distribution losses, transformation losses and statistical differences.  According to the reduction target of each country we have calculated the percentage to be reduced with respect to 2010 values.
<b>Unit:</b> Percentage of Mtoe to be reduced with respect to 2010
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database..">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database..</a>
<b>Year:</b> 2010.
<b>NUTS level:</b> Country level.
<b>Gaps:</b> Gaps in this indicator are related to:  (i) Data are not available for AL, BA, XK, RS, ME and MK. (ii) CZ, NO, NL, UK, CH, SI, IS, HR didn't defined national targets for this EU2020S headline indicator.

<b>Indicator Name: Change in energy intensity of the economy, 2000-2010</b>
<b>DLM: Map 45/DFR: Map 2.17/FR: Map 2.11</b>
<b>EU headline target:</b> Yes (+20% efficiency, - 368 Mtoe).
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Green economy, climate change and energy.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The energy intensity of the economy is expressed as the ratio between the gross inland consumption of energy and the gross domestic product (GDP) for a given calendar year. It measures the energy consumption of an economy and its overall energy efficiency. The gross inland consumption of energy is calculated as the sum of the gross inland consumption of five energy types: coal, electricity, oil, natural gas and renewable energy sources. The GDP figures are taken at chain linked volumes with reference year 2000. Since gross inland consumption is measured in kgoe (kilogram of oil equivalent) and GDP in 1000 EUR, this ratio is measured in kgoe per 1 000 EUR.  The EU headline target is to improve the energy efficiency in 20%, i.e. a reduction of energy consumption in 368 Mtoe (million tonnes of oil equivalent).
<b>The indicator shows the change in 2010 compared to 2000.</b>
<b>Unit:</b> Percentage of change.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2010 compared to 2000.
<b>NUTS level:</b> Country level.
<b>Gaps:</b> Gaps in this indicator are related to:  Data are not available for IS, AL, BA, XK, RS, ME.

<b>Indicator Name: Employment in industries with high energy spending</b>
<b>DLM: Map46/DFR: Map 2.18/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Green economy, climate change and energy.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> This indicator shows the share of employees in industries with high energy spending. It was obtained by estimating the sectors with the highest spending on energy products on NACE 2 digit level and later, by calculating the total people employed in those sectors.
<b>Unit:</b> Percentage of total employment.
<b>Source:</b> SIESTA calculations <sup>80</sup> using EUROSTAT data and the methodology proposed by Rerisk ESPON project. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2009.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to:  (i) Data are not available for IS, AL, BA, XK, RS, ME, MK, FR, TR and HR.

80 See section 4.1.4 of this report to find more specifications about the method to calculate this indicator.



<b>Indicator Name: Share of people commuting</b>
<b>DLM: Map 47/DFR: Map 2.23/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Green economy, climate change and energy.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the share of people commuting to another region or country over total employment. Data for NO, TR, EL, PT, FR91, FR92, FR93, FR94 do not include people commuting to another country.
<b>Unit:</b> Percentage of total employment.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2009. Data for CH, NO and SI are shown for 2007. Data for IE are shown for 2006.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for MK, AL, BA, XK, RS, ME.</li> </ul>

<b>Indicator Name: Share of journeys to work by car in LUZ</b>
<b>DLM: Map 48</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Green economy, climate change and energy.
<b>The indicator was included in the Final Atlas:</b> <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
<b>Definition:</b> The indicator shows the share of population who make journeys to work by car. A journey to work refers to the shortest trip (from place of residency to the work place, including change of transport mode) by commuters travelling to work places located within the boundary and should include trips by commuters not resident within the boundary but working within.  Urban Audit defines Larger Urban Zone (Label "LUZ") as an approximation of the functional urban zone centred around the town/ city.
<b>Unit:</b> Percentage.
<b>Source:</b> EUROSTAT – URBAN AUDIT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> Combined years. Data for BE, DE, EE, ES, SK, UK and FI are shown for 2008. Data for DK, FR004I, FR022L and NL are shown for 2003. IE and FR025 are shown for 2004. SE and NO are shown for 2005.
<b>Territorial Unit:</b> LUZ.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>i) Data are not available for AT, BG, CZ, EL, IT, CY, LV, LT, LU, HU, MT, PL, PT, RO, SI, HR, TR and CH.</li> </ul>

<b>Indicator Name: Coverage rate of municipal waste collection</b>
<b>DLM: Map 49</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Green economy, climate change and energy.
<b>The indicator was included in the Final Atlas:</b> <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
<b>Definition:</b> The indicator shows Coverage rate of municipal waste collection (%) by NUTS 2 regions
<b>Unit:</b> % of population by organised municipal waste collection
Source: EUROSTAT (Municipal waste statistics). Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a>
IE data come from the Environmental Protection Agency of Ireland.
<b>Year:</b> 2008. Data for NO are shown for 2009. Data for IE are shown for 2010.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to: (i) Data are not available for EL, CH, FR, ES, UK, DK, IS, FI, SE, EE, LV, AL, BA, XK, RS, ME.

<b>Indicator Name: Urban waste-water treatment capacity</b>
<b>DLM: Map 50/ DFR: Map 2.24/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Green economy, climate change and energy.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the treatment capacity for waste and water, expressed by percentage of generated load. It is based on Urban Waste Water Treatment (UWWT) concerning to the collection, treatment and discharge of urban waste water and the treatment and discharge of waste water from certain industrial sectors. Its aim is to protect the environment from any adverse effects caused by the discharge of such waters.
<b>Unit:</b> Percentage of generated load.
<b>Source:</b> DG REGIO.
<b>Year:</b> 2007.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to: (i) Data are not available for TR, EL, NO, BG, IS, CH, LV, CZ, MK, HR, AL, BA, XK, RS, ME. (ii) Data are not available for the following regions: ITG1, ITF5 and ITF6.

<b>Indicator Name: Protected areas included in Natura2000 network</b>
<b>DLM: Map 51/DFR: Map 2.25/ FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Green economy, climate change and energy.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the protected areas included in Natura2000 network. Natura 2000 is the centerpiece of EU nature & biodiversity policy. It is an EU wide network of nature protection areas established under the 1992 <a href="#">Habitats Directive</a> . The aim of the network is to assure the long-term survival of Europe's most valuable and threatened species and habitats. It is comprised of Special Areas of Conservation (SAC) designated by Member States under the Habitats Directive, and also incorporates Special Protection Areas (SPAs) which they designate under the 1979 <a href="#">Birds Directive</a> .
<b>Unit:</b> Percentage of total NUTS 3 area.
<b>Source:</b> DG REGIO.
<b>Year:</b> 2009.
<b>NUTS level:</b> NUTS 3.
<b>Gaps:</b> Gaps in this indicator are related to: (i) Data are not available for TU, CH, NO, IS, MK, HR, AL, BA, XK, RS, ME.

<b>Indicator Name: Environmental Pressures on European coasts<sup>81</sup></b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Sustainable Growth/Green economy, climate change and energy.
<b>The indicator was included in the Final Atlas:</b> <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
<b>Definition:</b> Composite indicator called "Environmental Pressures" derived from the ESPON project Seas ESaTDOR ( <i>European Seas and Territorial Development, Opportunities and Risks</i> ). This indicator provides a synthesis map of environmental pressures around the European coasts. This indicator has been developed in the ESaTDOR project by using three different data sets reflecting human impacts on the environment <sup>82</sup> : <ul style="list-style-type: none"> <li>- Incidence of invasive species;</li> <li>- Organic inputs;</li> <li>- Nutrient inputs from fertilisers.</li> </ul>
<b>Unit:</b> No units. Categories
<b>Source:</b> ESPON project Seas ESaTDOR
<b>Year:</b> 2009.
<b>NUTS level:</b> NUTS 3.
<b>Gaps:</b> Gaps in this indicator are related to: (i) Data are not available for TU, CH, NO, IS, MK, HR, AL, BA, XK, RS, ME.

81 This is an indicator that was not considered during all the SIESTA scientific workflow. However, ESPON CU suggested taking it into consideration between the Draft Final Report and the Final Report in order to discuss if it was worthwhile for the Atlas. The map has been incorporated into the analysis carried out in the context of the report on green economy (Annex B), but eventually it has not been included in the Atlas.

82 For more details on datasets employed and about methodological aspects, see ESaTDOR project in the ESPON website <[www.espon.eu/main/menu\\_projects/menu\\_appliedresearch/esatdor.html](http://www.espon.eu/main/menu_projects/menu_appliedresearch/esatdor.html)> (Accessed 2012-11-18).

#### 4.2.7.3. Research, Development and Innovation

<b>Indicator Name: R&amp;D expenditure in % of GDP</b>
<b>DLM: Map 2/DFR: Map 3.1/FR: Map 3.1</b>
<b>EU headline target:</b> Yes (3 %).
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Innovative territories/Context.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Innovation.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator provided is GERD (Gross domestic expenditure on R&D) as a percentage of GDP. Research and experimental development (R&D) comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of this stock of knowledge to devise new applications. (Frascati Manual, 2002 edition, § 63).
<b>Unit:</b> Percentage of GDP.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> . Data for RS were provided by the Statistical Office of the Republic of Serbia.
<b>Year:</b> Data are available for 2009 for all countries except EL, which most recent year available is 2005. Data for RS are from 2010.
<b>NUTS level:</b> NUTS 2. Data for TR, CH and NO are all available at country level.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS and ME.</li> <li>(ii) Data are not available for the following French regions: FR91, FR92, FR93, and FR94.</li> </ul>

<b>Indicator Name: R&amp;D expenditure in % of GDP. Distance to national 2020 target</b>
<b>DLM: Map 3/DFR: Map 3.2/FR: Map 3.2</b>
<b>EU headline target:</b> Yes (3 %).
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Innovative territories/Context.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Innovation.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The GERD (Gross domestic expenditure on R&D) is measured as a percentage of GDP. "Research and experimental development (R&D) comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of this stock of knowledge to devise new applications" (Frascati Manual, 2002 edition, § 63 ).
<b>The indicator shows the difference between NUTS 2 and the respective EU 2020 national target.</b>
<b>Unit:</b> Percentage points difference.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> Data are available for 2009 for all countries except for EL, which most recent year available is 2005. Data for RS are from 2010
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS and ME.</li> <li>(ii) Data are not available for the following French regions: FR91, FR92, FR93, and FR94.</li> <li>(iii) NO, HR, IS, CH, UK, TR, AL, RS, MK and EL do not have national target.</li> </ul>

<b>Indicator Name: Total expenditure in R&amp;D, change 2003-2009</b>
<b>DLM: Map 4/DFR: Map 3.3/FR: Map 3.3</b>
<b>EU headline target:</b> Yes (3 %).
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Innovative territories/Context.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Innovation.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator provided is GERD (Gross domestic expenditure on R&D) as a percentage of GDP. "Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of this stock of knowledge to devise new applications" (Frascati Manual, 2002 edition, § 63 ).
<b>The indicator shows the change in R&amp;D expenditure for 2009 compared to 2003 values.</b>
<b>Unit:</b> Percentage points difference.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2009 compared to 2003. Change in CH is 2004-2008. Change in AT is 2004-2009.
<b>NUTS level:</b> NUTS 2. Data for NO, DK, BE, UK, HR, TR and EL are only available at country level.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS and ME.</li> <li>(ii) Data are not available for the following NUTS 2 regions: FR91, FR92, FR93 and FR94.</li> </ul>

<b>Indicator Name: Human resources in science and technology</b>
<b>DLM: Map 5/DFR: Map 3.4/FR: Map 3.4</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Innovation.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> This indicator gives the percentage of the total labour force in the age group 25-64, that is classified as Human Resources in Science and Technology (HRST), i.e. having either successfully completed an education at the third level in an S field of study or is employed in an occupation where such an education is normally required.
<b>Unit:</b> Percentage of active population.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2010. Data for CH are available for 2009.
<b>NUTS level:</b> NUTS 2. Data for TR, CH and NO are all available at country level.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS and ME.</li> <li>(ii) Data are not available for the following French regions: FR91, FR92, FR93, and FR94.</li> </ul>

<b>Indicator Name: Research specialisation in NBIC technologies</b>
<b>DLM: Map 6/DFR: Map 3.7/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Innovation.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the share of the number research projects in which the city has participated in relation to its population. This index measures the specialization of cities in NBIC research. NBIC is the acronyms of Nanotechnology, Biotechnology, Information technology and Cognitive science.
<b>Unit:</b> Number of projects/population of the city.
<b>Source:</b> ESPON 2013DB - FOCI project. Data were directly downloaded from ESPON 2013 Database: <a href="http://database.espon.eu/data">http://database.espon.eu/data</a>
<b>Year:</b> 1986-2006
<b>Territorial Unit:</b> FUA. A Functional Urban Area (FUA) for countries with more than 10 million inhabitants is defined as having an urban core of at least 15,000 inhabitants and over 50,000 in total population. For smaller countries, a FUA should have an urban core of at least 15,000 inhabitants and more than 0.5% of the national population, as well as having functions of national or regional importance.

<b>Indicator Name: Business R&amp;D expenditure as % of GDP</b>
<b>DLM: Map 7/DFR: Map 3.5/FR: Map 3.5</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Innovation.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator includes all expenditures for R&D performed within the business enterprise sector (BERD) on the national territory during a given period, regardless of the source of funds. R&D expenditure in BERD is shown as a percentage of GDP
<b>Unit:</b> Percentage of GDP.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2009, except BG shown for 2008 and EL for 2007.
<b>NUTS level:</b> NUTS 2. Data for NO, BE, TR and CH are all available at country level.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS, ME and MK.</li> <li>(ii) Data are not available for the following French regions: FR91, FR92, FR93, and FR94.</li> </ul>

<b>Indicator Name: Employment in knowledge-intensive activities</b>
<b>DLM: Map 8</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Innovation.
<b>The indicator was included in the Final Atlas:</b> <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
<p><b>Definition:</b> The indicator shows the share of population employed in knowledge-intensive activities. EUROSTAT defines the following sectors as knowledge-intensive services, abbreviated as KIS (numbers between brackets are the NACE division):</p> <p><b>1. Knowledge-intensive high-tech services:</b> Post and telecommunications (64), Computer and related activities (72), Research and development (73), knowledge-intensive market services (excluding financial intermediation and high-tech services), Water transport (61), Air transport (62), Real estate activities (70), Renting of machinery and equipment without operator, and of personal and household goods (71), Other business activities (74).</p> <p><b>2. Knowledge-intensive financial services:</b> Financial intermediation, except insurance and pension funding (65), Insurance and pension funding, except compulsory social security (66), Activities auxiliary to financial intermediation (67).</p> <p><b>3. Other knowledge-intensive services:</b> Education (80) Health and social work (85).</p> <p><b>Unit:</b> Percentage of total employment.</p> <p><b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a>.</p> <p><b>Year:</b> 2010.</p> <p><b>NUTS level:</b> NUTS 2.</p> <p><b>Gaps:</b> Gaps in this indicator are related to:</p> <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS, ME, MK and CH.</li> <li>(ii) Data are not available for the following French regions: FR91, FR92, FR93, and FR94.</li> </ul>

<b>Indicator Name: Per capita total patent applications</b>
<b>DLM: Map 9/DFR: Map 3.6/FR: Map 3.6</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Innovation.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<p><b>Definition:</b> The indicator shows the number of patent applications per 1000 inhabitants to the European Patent Office (EPO) by inventor's region of residence.</p> <p>Data refer to applications filed directly under the European Patent Convention or to applications filed under the Patent Co-operation Treaty and designated to the EPO (Euro-PCT). Patent applications are counted according to the year in which they were filed at the EPO and are broken down according to the International Patent Classification (IPC). They are also broken down according to the inventor's place of residence, using fractional counting if multiple inventors or IPC classes are provided to avoid double counting.</p> <p><b>Unit:</b> Number per 1000 inhabitants.</p> <p><b>Source:</b> OECD REGPAT DATABASE. Data were directly downloaded from the OECD statistics webpage: <a href="http://stats.oecd.org/">http://stats.oecd.org/</a></p> <p><b>Year:</b> 2008.</p> <p><b>NUTS level:</b> NUTS 3. NL, BE and EL are shown at NUTS 2 level.</p> <p><b>Gaps:</b> Gaps in this indicator are related to:</p> <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS, ME and MK.</li> </ul>

<b>Indicator Name: High tech patent applications as a % of total patent applications</b>
<b>DLM: Map 10</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Innovation.
<b>The indicator was included in the Final Atlas:</b> <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
<p><b>Definition:</b> The indicator shows the share of high-tech patent applications to total patents applied to the European Patent Office (EPO). Data refer to applications filed directly under the European Patent Convention or to applications filed under the Patent Co-operation Treaty and designated to the EPO (Euro-PCT). Patent applications are counted according to the year in which they were filed at the EPO and are broken down according to the International Patent Classification (IPC). They are also broken down according to the inventor's place of residence, using fractional counting if multiple inventors or IPC classes are provided to avoid double counting.</p> <p>The definition of high-technology patents uses specific subclasses of the International Patent Classification (IPC) as defined in the trilateral statistical report of the EPO, JPO and USPTO.</p>
<b>Unit:</b> Percentage of total patent applications.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2008.
<b>NUTS level:</b> NUTS 3. NL and EL are shown for at NUTS 2 level.
<p><b>Gaps:</b> Gaps in this indicator are related to:</p> <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS, ME, MK, TR, NO, CH and IS.</li> <li>(ii) Data are not available for the following NUTS regions: FR91, FR92, FR93, FR94, ES13, ES23, ES43, ES53, ESZZ, PL33, PL62, PT15,PT18, PT30, EL11, EL12, EL13, EL21, EL22, EL23, EL25, EL41, EL42, EL43, FI20, FI93, RO12, RO21, RO22, ITF2, HU31, HU32, BG31, BG32, BG33, BG42, SIZZ, and SK03.</li> </ul>



#### 4.2.7.4. Education

<p><b>Indicator Name: Early leavers from education and training. People aged 18 to 24<sup>83</sup></b></p> <p><b>DLM: Map 11/DFR: Map 3.8/FR: Map 3.7</b></p>
<p><b>EU headline target:</b> Yes (a decrease of 10% is desired).</p>
<p><b>ESPON Territorial Indicator:</b> Yes.</p> <p><b>Theme/Category:</b> Social inclusion and quality of life/Change.</p> <p><b>Proposed by:</b> INTERCO Project.</p>
<p><b>Priority/ATLAS Subsection:</b> Smart Growth/ Education.</p> <p><b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no</p>
<p><b>Definition:</b> The indicator shows the share of people aged 18-24 with at most lower secondary education and not in further education or training.</p> <p>Early leavers from education and training refers to persons aged 18 to 24 fulfilling the following two conditions: first, the highest level of education or training attained is ISCED 0, 1, 2 or 3c short, second, respondents declared not having received any education or training in the four weeks preceding the survey (numerator). The denominator consists of the total population of the same age group, excluding no answers to the questions "highest level of education or training attained" and "participation to education and training".</p>
<p><b>Unit:</b> Percentage of population aged 18 to 24.</p>
<p><b>Source:</b> EUROSTAT (EU Labour Force Survey). This dataset was provided by EUROSTAT office via e-mail query.</p>
<p><b>Year:</b> 2010, except AL that are shown for 2009.</p>
<p><b>NUTS level:</b> NUTS 2. Data for RS, AL and MK are all available at country level.</p>
<p><b>Gaps:</b> Gaps in this indicator are related to:</p> <ul style="list-style-type: none"> <li>(i) Data are not available for BA, XK and ME.</li> <li>(ii) Data are not available for the following French regions: FR91, FR92, FR93, and FR94.</li> </ul>

<sup>83</sup> See section 4.2.3 and table 13 for further specifications about gaps and data quality of this dataset.

<b>Indicator Name: Early leavers from education and training<sup>84</sup>. Distance to 2020 national target</b>
<b>DLM: Map 12/DFR: Map 3.9/FR: Map 3.8</b>
<b>EU headline target:</b> Yes (a decrease of 10% is desired).
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Education.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> Early leavers from education and training refers to persons aged 18 to 24 fulfilling the following two conditions: first, the highest level of education or training attained is ISCED 0, 1, 2 or 3c short, second, respondents declared not having received any education or training in the four weeks preceding the survey (numerator). The denominator consists of the total population of the same age group, excluding no answers to the questions "highest level of education or training attained" and "participation to education and training".
<b>The indicator shows the difference between the NUTS 2 values in 2010 and the respective EU 2020 national target.</b>
<b>Unit:</b> Percentage points difference.
<b>Source:</b> EUROSTAT (EU Labour Force Survey) provided by EUROSTAT office. European 2020 targets were obtained from the following document <a href="http://ec.europa.eu/europe2020/pdf/targets_en.pdf">http://ec.europa.eu/europe2020/pdf/targets_en.pdf</a> available in the European Commission Web site.
<b>Year:</b> 2010.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for BA, XK and ME.</li> <li>(ii) Data are not available for the following French regions: FR91, FR92, FR93, and FR94.</li> <li>(iii) NO, HR, IS, CH, UK, TR, AL, RS and MK do not have national target.</li> </ul>

<b>Indicator Name: Early leavers from education and training<sup>85</sup>. Change 2008-2010</b>
<b>DLM: Map 13/DFR: Map 3.10/FR: Map 3.9</b>
<b>EU headline target:</b> Yes (10%).
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Education.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> Early leavers from education and training refers to persons aged 18 to 24 fulfilling the following two conditions: first, the highest level of education or training attained is ISCED 0, 1, 2 or 3c short, second, respondents declared not having received any education or training in the four weeks preceding the survey (numerator). The denominator consists of the total population of the same age group, excluding no answers to the questions "highest level of education or training attained" and "participation to education and training".
<b>The indicator shows the change occurred in NUTS value for 2010 compared to 2008.</b>
<b>Unit:</b> Percentage points difference.
<b>Source:</b> EUROSTAT (EU Labour Force Survey) provided by EUROSTAT office.
<b>Year:</b> 2010 compared to 2008.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for BA, XK and ME.</li> <li>(ii) Data are not available for the following French regions: FR91, FR92, FR93, and FR94.</li> </ul>

84 See section 4.2.3 and table 13 for further specifications about gaps and data quality of this dataset.

85 See section 4.2.3 and table 13 for further specifications about gaps and data quality of this dataset.

<b>Indicator Name: Proportion of students not completing their compulsory education in LUZ.</b>
<b>DLM: Map 14/DFR: Map 3.11/FR: Map 3.10</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Education
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<p><b>Definition:</b> Students not completing compulsory education at institutions offering it within the specified boundaries ("workplace based") are all students of any age, leaving compulsory education before completion (in the reference year) or without any diplomas. This comprises both private and public education. The term "compulsory education" is adapted to the institutional arrangements of the country.</p> <p>The International standard classification of education, abbreviated as ISCED defined 1 and 2 level as:</p> <p>Level 1: Primary education or first stage of basic – compulsory – education;</p> <p>Level 2: Lower secondary or second stage of basic education. It corresponds to the first cycle of secondary education. In countries with no system break between lower secondary and upper secondary education and where lower secondary education lasts more than three years, only the first three years following primary education are counted as lower secondary education. Lower secondary education may either be "terminal" preparing students for entry directly into working life and or "preparatory" preparing students for upper secondary education.</p> <p><b>The indicator shows the share of students leaving compulsory education without having a diploma and total students registered for final year of compulsory education.</b></p>
<b>Unit:</b> Percentage of total number of students.
<b>Source:</b> EUROSTAT-URBAN AUDIT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> ES, DE, RO, FI, SE and UK are shown for 2008. FR is shown for 2006. CY, DK, EL and SK are shown for 2004.
<b>Territorial Unit:</b> LUZ. Urban Audit defines Larger Urban Zone (Label "LUZ") as an approximation of the functional urban zone centred around the town/ city.
<p><b>Gaps:</b> Gaps in this indicator are related to:</p> <p>(i) Data are not available for AT, CZ, IT, HU, MT, NL, PL and PT.</p>

<b>Indicator Name: Tertiary educated, aged group 30-34<sup>86</sup></b>
<b>DLM: Map 15/DFR: Map 3.12/FR: Map 3.11</b>
<b>EU headline target:</b> Yes (40 %).
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Education.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the share of population aged 30-34 who have successfully completed university or university-like (tertiary-level) education with an education level ISCED 1997 (International Standard Classification of Education) of 5-6. This indicator measures the Europe 2020 strategy's headline target to increase the share of the 30-34 year olds having completed tertiary or equivalent education to at least 40% in 2020.
<b>Unit:</b> Percentage of total population aged 30-34.
<b>Source:</b> EUROSTAT (EU Labour Force Survey) provided by EUROSTAT office.
<b>Year:</b> 2010.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS and ME.</li> <li>(ii) Data are not available for the following French regions: FR91, FR92, FR93, and FR94.</li> </ul>

<b>Indicator Name: Tertiary educational, age group 30-34<sup>87</sup>. Distance to the national target</b>
<b>DLM: Map 16/DFR: Map 3.13/FR: Map 3.12</b>
<b>EU headline target:</b> Yes (40 %).
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Education.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the share of population aged 30-34 who have successfully completed university or university-like (tertiary-level) education with an education level ISCED 1997 (International Standard Classification of Education) of 5-6. This indicator measures the Europe 2020 strategy's headline target to increase the share of the 30-34 year olds having completed tertiary or equivalent education to at least 40% in 2020.
<b>The indicator shows the difference between the NUTS 2 value in 2010 and the respective EU 2020 national target.</b>
<b>Unit:</b> Percentage points difference.
<b>Source:</b> EUROSTAT (EU Labour Force Survey) provided by EUROSTAT office. European 2020 targets were obtained from the following document <a href="http://ec.europa.eu/europe2020/pdf/targets_en.pdf">http://ec.europa.eu/europe2020/pdf/targets_en.pdf</a> available in the European Commission Web site.
<b>Year:</b> 2010.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS, ME and MK.</li> <li>(ii) Data are not available for the following French regions: FR91, FR92, FR93, and FR94.</li> <li>(iii) NO, HR, IS, CH, UK and TR do not have national target.</li> </ul>

86 See section 4.2.3 and table 13 for further specifications about gaps and data quality of this dataset

87 See section 4.2.3 and table 13 for further specifications about gaps and data quality of this dataset.

<b>Indicator Name: Tertiary educational, age group 30-34<sup>88</sup>. Change 2008-2010</b>
<b>DLM: Map 17/DFR: Map 3.14/FR: Map 3.13</b>
<b>EU headline target:</b> Yes (40 %).
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Education.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the share of population aged 30-34 who have successfully completed university or university-like (tertiary-level) education with an education level ISCED 1997 (International Standard Classification of Education) of 5-6. This indicator measures the Europe 2020 strategy's headline target to increase the share of the 30-34 year olds having completed tertiary or equivalent education to at least 40% in 2020.
<b>The indicator shows the change occurred in NUTS 2 value for 2010 compared to 2008.</b>
<b>Unit:</b> Percentage points difference.
<b>Source:</b> EUROSTAT (EU Labour Force Survey) provided by EUROSTAT office.
<b>Year:</b> 2010 compared to 2008.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS and ME.</li> <li>(ii) Data are not available for the following French regions: FR91, FR92, FR93 and FR94.</li> </ul>

<b>Indicator Name: Share of population having completed tertiary education aged group 25-64</b>
<b>DLM: Map 18</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Innovative territories/Change.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Education.
<b>The indicator was included in the Final Atlas:</b> <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
<b>Definition:</b> The indicator shows the share of population aged 25-64 who have successfully completed university or university-like (tertiary-level) education with an education level ISCED 1997 (International Standard Classification of Education) of 5-6.
<b>Unit:</b> Percentage of total population aged 25-64.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2010.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS and ME.</li> <li>(ii) Data are not available for the following French regions: FR91, FR92, FR93, and FR94.</li> </ul>

88 See section 4.2.3 and table 13 for further specifications about gaps and data quality of this dataset.

<b>Indicator Name: Proportion of working age population qualified at level 5 or 6 ISCED</b>
<b>DLM: Map 19</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Education
<b>The indicator was included in the Final Atlas:</b> <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
<b>Definition:</b> The map illustrates the proportion of population aged 15-64 qualified at tertiary level (ISCED-5 and ISCED-6) living in Urban Audit cities, as a percentage of the total population aged 15 to 64. The data illustrated is for combined years ranging from 2004 to 2008. Map 19 is meant to complement the data on tertiary education attainment provided by Map 18 at the regional level through its particular focus on Europe's Large Urban Zones as defined by Urban Audit. We must note, however, that the age group considered for Map 19 is 15-64, while the age group considered for Map 18 was 25-64.
<b>Unit:</b> Percentage of total working age population
<b>Source:</b> EUROSTAT-URBAN AUDIT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a>
<b>Year:</b> AT, BG, DE, FI, SE, EE AND UK are shown for 2008. FR is shown for 2006. Data for HU is available for 2005. CY, DK, EL and SK are shown for 2004.
<b>Territorial Unit:</b> LUZ. Urban Audit defines Larger Urban Zone (Label "LUZ") as an approximation of the functional urban zone centred around the town/city.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for LV, LT, RO, IT, ES, PT, PL, CH, CZ.</li> </ul>

<b>Indicator Name: Percent of young people aged 15-24 not in work, education or training (NEET)<sup>89</sup></b>
<b>DLM: Map 20/DLM: Map 20/DFR: Map 3.15/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Education.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the young people aged 15-24 neither in employment nor in education and training (NEET). The numerator of the indicator refers to persons who meet the following two conditions: <ul style="list-style-type: none"> <li>○ (a) They are not employed (i.e. unemployed or inactive according to the International Labour Organisation definition) and</li> <li>○ (b) They have not received any education or training in the four weeks preceding the survey.</li> </ul> The denominator in the total population consists of the same age group and sex, excluding the respondents who have not answered the question 'participation to regular education and training'.
<b>Unit:</b> Percentage of total population aged 15-24.
<b>Source:</b> EUROSTAT (EU Labour Force Survey). Data were provided by EUROSTAT office via e-mail query.
<b>Year:</b> 2010.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS and ME.</li> <li>(ii) Data are not available for the following French regions: FR91, FR92, FR93 and FR94.</li> </ul>

89 See section 4.2.3 and table 13 for further specifications about gaps and data quality of this dataset.

#### 4.7.1.5. Digital Society

<b>Indicator Name: People working in the ICT sector</b>
<b>DLM: Map 21/DFR: Map 3.16/FR: Map 3.14</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Digital Society.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the share of employees of total employment working in NACE code J. NACE is the acronym used to designate the various statistical classifications of economic activities developed since 1970 in the European Union (EU). NACE provides the framework for collecting and presenting a large range of statistical data according to economic activity in the fields of economic statistics (e.g. production, employment, national accounts) and in other statistical domains. The Information and Communication Technologies (ICT) sector is assimilated to NACE Rev. 2 code J: Information and communication services.
<b>Unit:</b> Percentage of total employment.
<b>Source:</b> EUROSTAT (EU Labour Force Survey) downloaded from the EUROSTAT statistics Database Web site <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2010.
<b>NUTS level:</b> NUTS 2, except EL that is shown at NUTS 1 level.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS and ME.</li> <li>(ii) Data are not available for the following NUTS 2 regions: ES23, ES63, ES64, FR83, FR91, FR92, FR93, FR94, AT11, AT34, PL34, PL43, PL52, PT15, PT18, PT2, PT20, PT3, PT30, RO41, FI2, FI20, UKD1, UKE1, UKF3, UKK3, UKM5, UKM6, NO02, NO07, TR22, TR81, TR83 and TRB1.</li> </ul>

<b>Indicator Name: ICT patent applications as % of total patent application</b>
<b>DLM: Map 22</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Digital Society.
<b>The indicator was included in the Final Atlas:</b> <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
<b>Definition:</b> The indicator shows the share of ICT patents in total patent applications at the European Patent Office (EPO) by inventor's country of residence. Patent applications are counted according to the year in which they were filed at the EPO and are broken down according to the International Patent Classification (IPC). They are also broken down according to the inventor's place of residence, using fractional counting if multiple inventors or IPC classes are provided to avoid double counting.
<b>Unit:</b> Percentage of total patent applications.
<b>Source:</b> SIESTA calculations using data from OECD REGPAT database.
<b>Year:</b> 2008.
<b>NUTS level:</b> NUTS 3. NE and EL are only available at NUTS 2 level. IS data are available at country level.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS, ME and MK.</li> </ul>

<b>Indicator Name: Broadband penetration</b>
<b>DLM: Map 23/DFR: Map 3.17/FR: Map 3.15</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Access to services, markets and jobs/Change.
<b>Proposed by:</b> ESPON stakeholders.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Digital Society.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The broadband penetration describes the share of households with broadband penetration access. This indicator shows how widely broadband access to the internet has spread in the countries on the general level, not specifying by user group. Broadband lines are defined as those with a capacity equal or higher than 144 Kbits/s. Various technologies are covered; ADSL, cable modem as well as other types of access lines.
<b>Unit:</b> Percentage of total households.
<b>Source:</b> This indicator was provided by KIT project and it was calculated from data provided by EUROSTAT.
<b>Year:</b> Average 2006-2009.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS, ME, MK, TR, HR and CH.</li> <li>(ii) Data are not available for the following French regions: FR91, FR92, FR93, FR94 and for.</li> </ul>

<b>Indicator Name: Percentage of population buying online</b>
<b>DLM: Map 24/DFR: Map 3.18/FR: Map 3.16</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Digital Society.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the percentage of persons who bought or ordered goods or services (i.e. food, groceries, household goods, films, music, books, magazines, newspapers, clothes, sports goods, computer software or hardware, electronic equipment, shares, financial services, insurances, travel or holiday accommodation, tickets, lotteries or betting and other) over the Internet during the last year.
<b>Unit:</b> Percentage of total individuals.
<b>Source:</b> EUROSTAT (EU Labour Force Survey) downloaded from the EUROSTAT statistics Database Web site <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> Data for TR were provided by Turkstat. Data for CH were provided by Swiss Statistic Web Site: <a href="http://www.bfs.admin.ch/bfs/portal/en/index.html">http://www.bfs.admin.ch/bfs/portal/en/index.html</a> .
<b>Year:</b> 2010. Data for BG11, BG12, BG13, BG21, BG23 and FI2 are available for 2007. TR data corresponds to 2011. UKE1 data are available for 2009.
<b>NUTS level:</b> NUTS 2 except for: FR, DE, PL, and EL shown at NUTS 1 level and TR, RS shown at country level.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK and ME.</li> </ul>



<b>Indicator Name: Population who have never used a computer</b>
<b>DLM: Map 25/DFR: Map 3.19/FR: Map 3.17</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Smart Growth/ Digital Society.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the percentage of persons who have never used a computer (at home, at work or any other place).
<b>Unit:</b> Percentage of total individuals.
<b>Source:</b> EUROSTAT (Regional Statistics) downloaded from the EUROSTAT statistics Database Web site <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a>
Data for TR were provided by Turkstat.
<b>Year:</b> 2011. Data for BO, HR, TR, MK, DK, NL, SE, UK and ES63 are available for 2010. BG data correspond to 2007.
<b>NUTS level:</b> NUTS 2 for: IE, UK, SE, FI, NO, EE, LV, LT, BE, NL, PT, ES, CZ, AT, HU, HR, PL and RO. NUTS 1 for: FR, DE and EL. TR is shown at country level.
<b>Gaps:</b> Gaps in this indicator are related to: (i) Data are not available for AL, BA, XK, RS, CH and ME.

#### 4.2.7.6. Employment, Skills and Jobs

<b>Indicator Name: Employment rate of the age group 20-64</b>
<b>DLM: Map 52/DFR: Map 4.1/FR: Map 4.1</b>
<b>EU headline target:</b> Yes (75%).
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Innovative territories/Context.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/Employment, skills and jobs.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the share of employed people aged 20-64. The employment rate is calculated by dividing the number of persons aged 20 to 64 in employment by the total population of the same age group. The indicator is based on the EU Labour Force Survey. The survey covers the entire population living in private households and excludes those in collective households such as boarding houses, halls of residence and hospitals. Employed population consists of those persons who during the reference week did any work for pay or profit for at least one hour, or were not working but had jobs from which they were temporarily absent.
<b>Unit:</b> Percentage of total population aged 20-64.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2010, except data for AL and XK shown for 2009.
<b>NUTS level:</b> NUTS 2.

<b>Indicator Name: Employment rate of the age group 20-64. Distance to the national targets</b>
<b>DLM: Map 53/DFR: Map 4.2/FR: Map 4.2</b>
<b>EU headline target:</b> Yes (75%).
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Innovative territories/Context.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/Employment, skills and jobs.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The employment rate is calculated by dividing the number of persons aged 20 to 64 in employment by the total population of the same age group. The indicator is based on the EU Labour Force Survey. The survey covers the entire population living in private households and excludes those in collective households such as boarding houses, halls of residence and hospitals. Employed population consists of those persons who during the reference week did any work for pay or profit for at least one hour, or were not working but had jobs from which they were temporarily absent.
<b>The indicator shows the difference between the NUTS 2 value in 2010 and the respective EU 2020 national target.</b>
<b>Unit:</b> Percentage points difference.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2010.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS, ME, MK, HR, CH, UK, NO, IS and TR.</li> </ul>

<b>Indicator Name: Change in the employment rate, age group 20-64</b>
<b>DLM: Map 54/DFR: Map 4.3/FR: Map 4.3</b>
<b>EU headline target:</b> Yes (75%).
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Innovative territories/Context.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/Employment, skills and jobs.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The employment rate is calculated by dividing the number of persons aged 20 to 64 in employment by the total population of the same age group. The indicator is based on the EU Labour Force Survey. The survey covers the entire population living in private households and excludes those in collective households such as boarding houses, halls of residence and hospitals. Employed population consists of those persons who during the reference week did any work for pay or profit for at least one hour, or were not working but had jobs from which they were temporarily absent.
<b>The indicator shows the change occurred in NUTS 2 values for 2010 compared to 2008.</b>
<b>Unit:</b> Percentage points difference.
<b>Source:</b> EUROSTAT (EU Labour Force Survey) downloaded from the EUROSTAT statistics Database Web site <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2010 compared to 2008. Data for BG correspond to 2003-2010 change. Data for DE41 and FE42 are for 2002-2010 change. Data for DEB1, DEB2 and DEB3 correspond to 1999-2010 change. Data for HR are for 2002-2010 change. Data for XK correspond to 2001-2009 change. Data for ME are for 2001-2010 change and data for AL correspond to 2000-2009 change.
<b>NUTS level:</b> NUTS 2, except data for DK that are available at country level.
<b>Gaps:</b> Gaps in this indicator are related to: (i) Data are not available for MK, BA and TR.

<b>Indicator Name: Gender balance in employment rate, age group 20-64</b>
<b>DLM: Map 55/DFR: Map 4.4/FR: Map 4.4</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/Employment, skills and jobs.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The employment rate is calculated by dividing the number of persons aged 20 to 64 in employment by the total population of the same age group. The indicator is based on the EU Labour Force Survey. The survey covers the entire population living in private households and excludes those in collective households such as boarding houses, halls of residence and hospitals. Employed population consists of those persons who during the reference week did any work for pay or profit for at least one hour, or were not working but had jobs from which they were temporarily absent.
<b>The indicator shows the balance between male and female employment rate. It was obtained by subtracting the percentage of male employment from the female employment percentage, both expressed in terms of total population aged 20-64.</b>
<b>Unit:</b> Percentage points difference.
<b>Source:</b> SIESTA calculations using employment data from EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2010, except XK and AL that are shown for 2009.
<b>NUTS level:</b> NUTS 2.

<b>Indicator Name: Unemployment rate, age group 15 and over</b>
<b>DLM: Map 56/DFR: Map 4.5/FR: Map 4.5</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Economic performance and competitiveness/Change.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/Employment, skills and jobs.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator represents the unemployed persons as a percentage of the economically active population (i.e. labour force or sum of employed and unemployed). The indicator is based on the EU Labour Force Survey. Unemployed persons comprise persons aged 15-74 who were (all three conditions must be fulfilled simultaneously): 1. without work during the reference week; 2. currently available for work; 3. actively seeking work or who had found a job to start within a period of at most three months.
<b>Unit:</b> Percentage of total active population.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2009.
<b>NUTS level:</b> NUTS 3. Data for PT, NO, CH, BG, BE and TR are all available at NUTS 2 level.

<b>Indicator Name: Unemployment rate in LUZ</b>
<b>DLM: Map 57/DFR: Map 4.7/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Economic performance and competitiveness/Change.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/Employment, skills and jobs.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator represents the unemployed persons as a percentage of the economically active resident population (i.e. labour force or sum of employed and unemployed). The indicator is based on the EU Labour Force Survey. Unemployed persons comprise persons aged 15-74 who were (all three conditions must be fulfilled simultaneously): 1. without work during the reference week; 2. currently available for work; 3. actively seeking work or who had found a job to start within a period of at most three months.  Urban Audit defines Larger Urban Zone (Label "LUZ") as an approximation of the functional urban zone centred around the town/ city.
<b>Unit:</b> Percentage of total active resident population.
<b>Source:</b> EUROSTAT-URBAN AUDIT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> Combined years. Data for CY, LV, LT, MT, FI, SE, UK, NO and CH are shown for 2008. FR is shown for 2006 and HU for 2005. Data for AT, BE, CZ, DK, IE, EL, IT, NL, PT, RO, SI and SK are shown for 2004.
<b>Territorial Unit:</b> LUZ
<b>Gaps:</b> Gaps in this indicator are related to:  i) Data are not available for PL and TR.

<b>Indicator Name: Change in the unemployment rate</b>
<b>DLM: Map 58</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Economic performance and competitiveness/Change.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/Employment, skills and jobs.
<b>The indicator was included in the Final Atlas:</b> <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
<b>Definition:</b> The unemployment rate is expressed as a percentage of the economically active population (i.e. labour force or sum of employed and unemployed). The indicator is based on the EU Labour Force Survey. Unemployed persons comprise persons aged 15-74 who were (all three conditions must be fulfilled simultaneously): 1. without work during the reference week; 2. currently available for work; 3. actively seeking work or who had found a job to start within a period of at most three months.
<b>The indicator shows the change occurred in NUTS value for 2009 compared to 2007.</b>
<b>Unit:</b> Percentage points difference.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2009 compared to 2007.
<b>NUTS level:</b> NUTS 3. Data for PT, NO, CH, BG, BE and TR are all available at NUTS 2 level.

<b>Indicator Name: Gender balance in unemployment</b>
<b>DLM: Map 59/DFR: Map 4.6/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Social inclusion and quality of life/Context.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/Employment, skills and jobs.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The unemployment rate is expressed as a percentage of the economically active population (i.e. labour force or sum of employed and unemployed). The indicator is based on the EU Labour Force Survey. Unemployed persons comprise persons aged 15-74 who were (all three conditions must be fulfilled simultaneously): 1. without work during the reference week; 2. currently available for work; 3. actively seeking work or who had found a job to start within a period of at most three months.
<b>The indicator shows the balance between male and female unemployment rate. It was obtained by subtracting the percentage of male unemployment from the female unemployment percentage, both expressed in terms of total population aged 15-74.</b>
<b>Unit:</b> Percentage points difference.
<b>Source:</b> SIESTA team calculations using unemployment data provided by EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2009.
<b>NUTS level:</b> NUTS 3. Data for PT, NO, CH, BG, BE and TR are all available at NUTS 2 level.

<b>Indicator Name: Gender balance in unemployment in LUZ</b>
<b>DLM: Map 60/DFR: Map 4.8/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Social inclusion and quality of life /Context.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/Employment, skills and jobs.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The unemployment rate is expressed as a percentage of the economically active population (i.e. labour force or sum of employed and unemployed). The indicator is based on the EU Labour Force Survey. Unemployed persons comprise persons aged 15-74 who were (all three conditions must be fulfilled simultaneously): 1. without work during the reference week; 2. currently available for work; 3. actively seeking work or who had found a job to start within a period of at most three months.
<b>The indicator shows the balance between male and female unemployment rate. It was obtained by subtracting the percentage of female unemployment from the male unemployment percentage, both expressed in terms of total population aged 15-74.</b>
<b>Unit:</b> Percentage points difference.
<b>Source:</b> SIESTA team calculations using data provided by EUROSTAT-URBAN AUDIT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> . Urban Audit defines Larger Urban Zone (Label "LUZ") as an approximation of the functional urban zone centred around the town/ city.
<b>Year:</b> Combined years. Data for AT, BE, BG, DE, ES, LV, LT, MT, FI, SE, NO, CH and UK are shown for 2008. Data for HR, DK, IE, EL, SI and SK are shown for 2004. Data for FR are shown for 2006.
<b>Territorial Unit:</b> LUZ. Urban Audit defines Larger Urban Zone (Label "LUZ") as an approximation of the functional urban zone centred around the town/ city.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>i) Data are not available for CZ, IT, NL, PL, PT, RO and TR.</li> </ul>

<b>Indicator Name: Youth unemployment rate</b>
<b>DLM: Map 61/DFR: Map 4.9/FR: Map 4.6</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/Employment, skills and jobs.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator represents the percentage of the unemployed in the age group 15 to 24 years old compared to the total labour force (both employed and unemployed) in that age group. However, it should be remembered that a large share of people between these ages are outside the labour market (since many youths are studying full time and thus are not available for work), which explains why youth unemployment rates are generally higher than overall unemployment rates, or those of other age groups.
<b>Unit:</b> Percentage of total active population aged 15-24.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2009.
<b>NUTS level:</b> NUTS 3. Data for FR, PT, NO, BG, HR and TR are all available at NUTS 2 level.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for ME.</li> </ul>

<b>Indicator Name: Proportion of residents unemployed aged 15-24 in LUZ</b>
<b>DLM: Map 62/DFR: Map 4.10/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Economic performance and competitiveness/Change.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/Employment, skills and jobs.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator represents the proportion of residents unemployed aged 15-24 to the total economically active population aged 15-24. The indicator is based on the EU Labour Force Survey. Unemployed persons comprise of persons aged 15-74 who were (all three conditions must be fulfilled simultaneously): 1. without work during the reference week; 2. currently available for work; 3. actively seeking work or who had found a job to start within a period of at most three months.  Urban Audit defines Larger Urban Zone (Label "LUZ") as an approximation of the functional urban zone centred around the town/ city.
<b>Unit:</b> Proportion of total economically active population aged 15-24.
<b>Source:</b> EUROSTAT-URBAN AUDIT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> Combined years. Data for AT, BE, CZ, DE, MT, SK, FI, UK and CH are shown for 2008. Data for FR are shown for 2006. Data for HU are shown for 2005. Data for DK, IE, EL, ES, CY, LT, LU, LV, NL, PT, RO, SI and SE are shown for 2004.
<b>Territorial Unit:</b> LUZ.
<b>Gaps:</b> Gaps in this indicator are related to:  i) Data are not available for BG, IT, PL, HR and TR.

<b>Indicator Name: Life-long learning participants</b>
<b>DLM: Map 63/DFR: Map 4.11/FR: Map 4.7</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/Employment, skills and jobs.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator refers to persons aged 25 to 64 who stated that they received education or training in the four weeks preceding the survey (numerator). The denominator consists of the total population of the same age group, excluding those who did not answer to the question 'participation to education and training'. The information collected relates to all education or training whether or not relevant to the respondent's current or possible future job.
<b>Unit:</b> Percentage of total population aged 25-64.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2010.
<b>NUTS level:</b> NUTS 2. BG is shown at country level.
<b>Gaps:</b> Gaps in this indicator are related to:  (i) Data are not available for BA, XK, ME, and AL. (ii) Data are not available for the following French regions: FR91, FR92, FR93, and FR94.

<b>Indicator Name: Persons with low educational attainment</b>
<b>DLM: Map 64/DFR: Map 4.12/FR: Map 4.8</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/Employment, skills and jobs.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator corresponds to the share of persons aged 25-64 with lower secondary education attainment. It includes people with an education level ISCED (International Standard Classification of Education) of 2 or less. ISCED levels 0-2: pre-primary, primary and lower secondary education.  Pre-primary education is the initial stage of organised instruction, it is school -or centre- based and is designed for children aged at least 3 years old. Level 1 corresponds to primary education that begins between 5 and 7 years of age, and is the start of compulsory education where it exists and generally covers six years of full-time schooling. Level 2, lower secondary education, continues the basic programs of the primary level, although teaching is typically more subject-focused. Usually, the end of this level coincides with the end of compulsory education.
<b>Unit:</b> Percentage of total population aged 25-64.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2010.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to:  (i) Data are not available for BA, XK, ME, RS and AL.

<b>Indicator Name: Proportion of working age population qualified at level 1 or 2 ISCED in LUZ</b>
<b>DLM: Map 65/DFR: Map 4.13/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/Employment, skills and jobs.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator corresponds to the share of working age population in URBAN AUDIT cities with 1 or 2 ISCED (International Standard Classification of Education) level. Level 1 corresponds to primary education that begins between 5 and 7 years of age, is the start of compulsory education where it exists and generally covers six years of full-time schooling. Level 2, lower secondary education, continues the basic programs of the primary level, although teaching is typically more subject-focused. Usually, the end of this level coincides with the end of compulsory education.
<b>Unit:</b> Proportion of working age residents.
<b>Source:</b> EUROSTAT-URBAN AUDIT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> Combined years. Data for NO, UK, SE, LT, LV, LU, EE, DE, BG and AT are shown for 2008. Data for FR are shown for 2006. Data for HU are shown for 2005. Data for SK, SI, NL, CY, ES, EL and IE are shown for 2004.
<b>Territorial Unit:</b> LUZ. Urban Audit defines Larger Urban Zone (Label "LUZ") as an approximation of the functional urban zone centred around the town/ city.
<b>Gaps:</b> Gaps in this indicator are related to:  i) Data are not available for BE, CZ, DK, IT, PL, CH, PT, RO, FI, HR and TR.



<b>Indicator Name: Professionals in health sector</b>
<b>DLM: Map 66/DFR: Map 4.15/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/Employment, skills and jobs.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator corresponds to the number of physicians or doctors per 10.000 inhabitants. Data on physicians should refer to those "immediately serving patients", i.e. physicians who have direct contact with patients as consumers of health care services. In the context of comparing health care services across Member States, EUROSTAT considers that this is the concept which best describes the availability of health care resources. However, Member States use different concepts when they report the number of health care professionals. Therefore, for some countries, the data might include physicians who work in their profession but do not see patients (i.e. they work in research, administration etc.) or refer to physicians "licensed to practice" (i.e. successfully graduated physicians irrespective whether they see patients or not).
<b>Unit:</b> Professionals per 100.000 inhabitants.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2008 except AL that is shown for 2007 and MK shown for 2009.
<b>NUTS level:</b> NUTS 2. Data for UK and DE are available at NUTS1. Data for IE, HR and BE available for country level.
<b>Gaps:</b> Gaps in this indicator are related to: (i) Data are not available for BA, XK and RS.

<b>Indicator Name: People working in the public sector</b>
<b>DLM: Map 67/DFR: Map 4.14/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/Employment, skills and jobs.
<b>Definition:</b> The indicator corresponds to the share of persons working in public sector compared to total employed people. Public sector is assimilated to NACE Rev. 2 Codes O-Q: public administration, defence, education, human health and social work activities.
<b>Unit:</b> Percentage of total employment.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2010
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to: (i) Data are not available for AL, BA, XK, ME, MK and RS.

#### 4.2.7.7. Poverty and Exclusion

<p align="center"><b>Indicator Name: People at risk of poverty or social exclusion</b></p> <p><b>DLM: Map 68/DFR: Map 4.16/FR: not included</b></p>
<p><b>EU headline target:</b> Yes (19.5%).</p>
<p><b>ESPON Territorial Indicator:</b> Yes.</p> <p><b>Theme/Category:</b> Social inclusion and quality of life/Change.</p> <p><b>Proposed by:</b> ESPON stakeholders.</p>
<p><b>Priority/ATLAS Subsection:</b> Inclusive Growth/ Poverty and exclusion.</p> <p><b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> <b>yes</b> <input type="checkbox"/> <b>no</b></p>
<p><b>Definition:</b> This indicator corresponds to the percentage of total population who are: at risk of poverty or severely materially deprived or living in households with very low work intensity.</p> <p>Persons are only counted once even if they are present in several sub-indicators. At risk-of-poverty are persons with an equivalised disposable income below the risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income (after social transfers). Material deprivation covers indicators relating to economic strain and durables. Severely materially deprived persons have living conditions severely constrained by a lack of resources, they experience at least 4 out of 9 following deprivations items: cannot afford i) to pay rent or utility bills, ii) keep home adequately warm, iii) face unexpected expenses, iv) eat meat, fish or a protein equivalent every second day, v) a week holiday away from home, vi) a car, vii) a washing machine, viii) a colour TV, or ix) a telephone. People living in households with very low work intensity are those aged 0-59 living in households where the adults (aged 18-59) work less than 20% of their total work potential during the past year.</p> <p>The EU as a whole is committed to achieving at least 20 million people out of the risk of poverty or social exclusion. The objective implies to achieve a 19.5% the people at risk of poverty or social exclusion of the total population.</p> <p>This value was obtained by reducing 20 million people of the number of people at risk of poverty or social exclusion in 2010 and calculating its percentage over the total population at the same year.</p>
<p><b>Unit:</b> Percentage of total population.</p>
<p><b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a>.</p>
<p><b>Year:</b> 2010.</p>
<p><b>NUTS level:</b> NUTS 2. Data for UK, FR, DE, NL, PT, AT are only available at country level.</p> <p>Data for HU, BE and EI are shown for NUTS 1 (NUTS 1 are the lowest regional level for which data for the indicator is available).</p>
<p><b>Gaps:</b> Gaps in this indicator are related to:</p> <p>(i) Data are not available for AL, BA, XK, RS, ME, MK and TR.</p>

<b>Indicator Name: Population at risk of poverty or social exclusion. Distance to EU 2020 target</b>
<b>DLM: Map 69/DFR: Map 4.17/FR: Map 4.9</b>
<b>EU headline target:</b> Yes (19.5%).
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Social inclusion and quality of life/Change.
<b>Proposed by:</b> ESPON stakeholders.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/ Poverty and exclusion.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<p><b>Definition:</b> Population at risk of poverty or social exclusion refer to the sum of persons who are: at risk of poverty or severely materially deprived or living in households with very low work intensity.</p> <p>Persons are only counted once even if they are present in several sub-indicators. At risk-of-poverty are persons with an equivalised disposable income below the risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income (after social transfers). Material deprivation covers indicators relating to economic strain and durables. Severely materially deprived persons have living conditions severely constrained by a lack of resources, they experience at least 4 out of 9 following deprivations items: cannot afford i) to pay rent or utility bills, ii) keep home adequately warm, iii) face unexpected expenses, iv) eat meat, fish or a protein equivalent every second day, v) a week holiday away from home, vi) a car, vii) a washing machine, viii) a colour TV, or ix) a telephone. People living in households with very low work intensity are those aged 0-59 living in households where the adults (aged 18-59) work less than 20% of their total work potential during the past year.</p> <p>The EU target is to reduce the people at risk of poverty or social exclusion by at least 20 million people. Taking this into account, SIESTA team have calculated the percentage that represents this reduction from the people at risk of poverty or social exclusion by 2010, that is 17%. Due to the incomparability among national targets it was extrapolated to the EU 27 target for the regions.</p> <p>The distance to target (reduction of 17%) was obtained by subtracting the percentage of poor people in the year 2010 to the percentage of poor people which could not be overcome in 2020. This indicator shows the distance from the regions value in 2010 to the estimated region target reduction.</p>
<b>Unit:</b> Percentage points difference.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2010.
<b>NUTS level:</b> NUTS 2. Data for UK, FR, DE, NL, PT, AT are all available at country level. Data for HU, BE and EL are shown for NUTS 1.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS, ME, MK and TR.</li> </ul>

<b>Indicator Name: Disposable income per capita in PPS, 2008</b>
<b>DLM: Map 70/DFR: Map 4.18/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Social inclusion and quality of life/Change.
<b>Proposed by:</b> ESPON stakeholders.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/ Poverty and exclusion.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> This indicator corresponds to the purchasing power standard based on final consumption per inhabitant. <b>Final consumption expenditure</b> consists of expenditure incurred by residential institutional units on goods or services that are used for the direct satisfaction of the individual needs or wants or the collective needs of members of the community.
<b>Unit:</b> Purchasing Power Standard based on final consumption per inhabitant.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2008.
<b>NUTS level:</b> NUTS 2, except NO and BG available at country level.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS, ME, MK, CR, IS, TU and CH.</li> <li>(ii) Data are not available for the following French regions: FR91, FR92, FR93, and FR94.</li> </ul>

<b>Indicator Name: Median disposable annual household income in LUZ</b>
<b>DLM: Map 71</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Social inclusion and quality of life/Change.
<b>Proposed by:</b> ESPON stakeholders.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/ Poverty and exclusion.
<b>The indicator was included in the Final Atlas:</b> <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
<b>Definition:</b> This indicator shows the median disposable annual income in Euros (i.e. including transfer payments) by household. The disposable income of private households is the balance of primary income (operating surplus/mixed income plus compensation of employees plus property income received minus property income paid) and the redistribution of income in cash. These transactions comprise social contributions paid, social benefits in cash received, current taxes on income and wealth paid, as well as other current transfers. Disposable income does not include social transfers in kind coming from public administrations or non-profit institutions serving households.
<b>Unit:</b> Euros/household.
<b>Source:</b> EUROSTAT-URBAN AUDIT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> Combined years. BG, DE, EE, LV, LU, SK, FI, UK and NO are shown for 2008. BE, ES and CH are shown for 2004. CY is shown for 2003. SI for 2005 and NL for 2007.
<b>Territorial Unit:</b> LUZ. Urban Audit defines Larger Urban Zone (Label "LUZ") as an approximation of the functional urban zone centred around the town/ city.

<b>Indicator Name: People at risk of poverty after social transfer</b>
<b>DLM: Map 72/DFR: Map 4.19/FR: Map 4.10</b>
<b>EU headline target:</b> No. Nevertheless, constitutes a sub-indicator of people at risk of poverty or social exclusion EU target lines indicator.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/ Poverty and exclusion.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the share of persons with an equivalised disposable income below the risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income (after social transfers).
<b>Unit:</b> Percentage of total population.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2009.
<b>NUTS level:</b> NUTS 2. Data for BG, EL, NO and UK are available for NUTS 1. CH is available at country level.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS, ME, MK and HR.</li> <li>(ii) Data are not available for the following NUTS regions: FR91, FR92, FR93, FR94 and FI19.</li> </ul>

<b>Indicator Name: Percentage of households with less than 60% of the national median annual disposable income in LUZ</b>
<b>DLM: Map 73</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/ Poverty and exclusion.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator corresponds to the percentage of households with less than 60% national average income.  The disposable income of private households is the balance of primary income (operating surplus/mixed income plus compensation of employees plus property income received minus property income paid) and the redistribution of income in cash. These transactions comprise social contributions paid, social benefits in cash received, current taxes on income and wealth paid, as well as other current transfers. Disposable income does not include social transfers in kind coming from public administrations or non-profit institutions serving households.
<b>Unit:</b> Percentage of households.
<b>Source:</b> EUROSTAT-URBAN AUDIT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> Combined years. 2008, except LU, HU, UK, CH shown for 2004, NL for 2007 and SI for 2005.
<b>Territorial Unit:</b> LUZ. Urban Audit defines Larger Urban Zone (Label "LUZ") as an approximation of the functional urban zone centred around the town/ city.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>i) Data are not available for BE, AT, CZ, DK, IE, EL, ES, FR, IT, CY, LT, PL, PT, RO, SE and TR.</li> </ul>

<b>Indicator Name: Change in people at risk of poverty after social transfer, 2005-2010</b>
<b>DLM: Map 74/DFR: Map 4.20/FR: Map 4.11</b>
<b>EU headline target:</b> No. Nevertheless, constitutes a sub-indicator of people at risk of poverty or social exclusion EU target lines indicator.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/ Poverty and exclusion.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> People at risk of poverty after social transfer are persons with an equivalised disposable income below the risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income (after social transfers).
<b>The indicator shows the intensity and direction of the change occurred in NUTS value for 2010 compared to 2005.</b>
<b>Unit:</b> Percentage points difference.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2005-2010. Data for ES64 are shown for 2006-2010. TR is shown for 2005-2009. Data for FR, NL and RS are shown for 2006-2009 and DK for 2007-2010.
<b>NUTS level:</b> NUTS 2. Data for BE, EL and HU are available for NUTS 1. BG, CH, TR, SE and UK are available at country level.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS, ME, MK, HR and CH.</li> <li>(ii) Data are not available for the following NUTS regions: FR91, FR92, FR93, FR94 and FI19.</li> </ul>

<b>Indicator Name: Severely materially deprived people</b>
<b>DLM: Map 75/DFR: Map 4.21/FR: Map 4.12</b>
<b>EU headline target:</b> No. Nevertheless, constitutes a sub-indicator of people at risk of poverty or social exclusion EU target lines indicator.
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Social inclusion and quality of life/Context.
<b>Proposed by:</b> ESPON stakeholders.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/ Poverty and exclusion.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> This indicator corresponds to the percentage of total population who are severely materially deprived.  Severely materially deprived people have living conditions severely constrained by a lack of resources, they experience at least 4 out of 9 following deprivations items: cannot afford i) to pay rent or utility bills, ii) keep home adequately warm, iii) face unexpected expenses, iv) eat meat, fish or a protein equivalent every second day, v) a week holiday away from home, vi) a car, vii) a washing machine, viii) a colour TV, or ix) a telephone.
<b>Unit:</b> Percentage of total population.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2010.
<b>NUTS level:</b> NUTS 2. Data for FR, UK, BE, NL, DE, AT and PT are all available at country level. Data for EL are shown for NUTS 1.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>(i) Data are not available for AL, BA, XK, RS, ME, MK and TR.</li> </ul>

<b>Indicator Name: People living in households with very low work intensity</b>
<b>DLM: Map 76/DFR: Map 4.22/FR: Map 4.13</b>
<b>EU headline target:</b> No. Nevertheless, constitutes a sub-indicator of people at risk of poverty or social exclusion EU target lines indicator.
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Social inclusion and quality of life/Context.
<b>Proposed by:</b> ESPON stakeholders.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/ Poverty and exclusion.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> This indicator corresponds to the percentage of total population living in households with very low work intensity.  People living in households with very low work intensity are those aged 0-59 living in households where the adults (aged 18-59) work less than 20% of their total work potential during the past year.  The work intensity of a household is the ratio of the total number of months that all working-age household members have worked during the income reference year and the total number of months the same household members theoretically could have worked in the same period.
<b>Unit:</b> Percentage of total population.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2010.
<b>NUTS level:</b> NUTS 2. Data for FR, UK, BE, NL, DE, AT and PT are all available at country level. Data for EL, BL and HU are shown for NUTS 1
<b>Gaps:</b> Gaps in this indicator are related to:  (i) Data are not available for AL, BA, XK, RS, ME, MK and TR.

<b>Indicator Name: Share of long-term unemployment</b>
<b>DLM: Map 77/DFR: Map 4.23/FR: Map 4.14</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/ Poverty and exclusion.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the long-term unemployed as a percentage of the unemployed population.  Long-term unemployed (12 months and more) persons are those aged at least 15 not living in collective households who are without work within the next two weeks, are available to start work within the next two weeks and who are seeking work (have actively sought employment at some time during the previous four weeks or are not seeking a job because they have already found a job to start later). The total active population (labour force) is the total number of the employed and unemployed population. The duration of unemployment is defined as the duration of a search for a job or as the length of the period since the last job was held (if this period is shorter than the duration of the search for a job).
<b>Unit:</b> Percentage of total unemployed population.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2010.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to:  (i) Data are not available for AL, BA, XK, RS, ME, MK.

<b>Indicator Name: Proportion of long-term unemployed aged 15-24 in LUZ</b>
<b>DLM: Map 78</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/ Poverty and exclusion.
<b>The indicator was included in the Final Atlas:</b> <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
<b>Definition:</b> The indicator corresponds to the share of people aged 15-24 unemployed for more than six months in Urban AUDIT cities.  Long-term unemployed persons are those aged at least 15 not living in collective households who are without work within the next two weeks, are available to start work within the next two weeks and who are seeking work (have actively sought employment at some time during the previous four weeks or are not seeking a job because they have already found a job to start later).  The duration of unemployment is defined as the duration of a search for a job or as the length of the period since the last job was held (if this period is shorter than the duration of the search for a job).
<b>Unit:</b> Percentage of residents unemployed aged 15-24.
<b>Source:</b> EUROSTAT-URBAN AUDIT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> Combined years. EL, DE, PL, FI, LT, PL and BE are shown for 2008. UK, IE, ES, SE, EE, SI and HR are shown for 2004. Data for HU are shown for 2005.
<b>Territorial Unit:</b> LUZ. Urban Audit defines Larger Urban Zone (Label "LUZ") as an approximation of the functional urban zone centred around the town/ city.
<b>Gaps:</b> Gaps in this indicator are related to:  i) Data are not available for CZ, DK, FR, IT, NL, AT, PT, RO, TR, NO and CH.

<b>Indicator Name: Ageing index</b>
<b>DLM: Map 79/DFR: Map 4.24/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Social inclusion and quality of life/Context.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/ Poverty and exclusion.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> Ageing index is the ratio between the number of people aged more than 65 (numerator) and the population who are less than 15 (denominator).
<b>Unit:</b> Population above 65/people below 15.
<b>Source:</b> EUROSTAT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> 2010.
<b>NUTS level:</b> NUTS 3.
<b>Gaps:</b> Gaps in this indicator are related to:  (i) Data are not available for AL, BA, XK, RS, ME, MK.



<b>Indicator Name: Ageing index in LUZ</b>
<b>DLM: Map 80/DFR: Map 4.25/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPN Territorial Indicator:</b> Yes.
<b>Theme/Category:</b> Social inclusion and quality of life/Context.
<b>Proposed by:</b> INTERCO Project.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/ Poverty and exclusion.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> The indicator shows the ageing index in URBAN AUDIT cities. It is expressed as the ratio between the number of people aged more than 65 (numerator) and the population who are less than 15 (denominator).
<b>Unit:</b> Population above 65/people below 15.
<b>Source:</b> EUROSTAT-URBAN AUDIT. Data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> .
<b>Year:</b> Combined years. 2008, except for DK, IE, CY, TR shown for 2004.
<b>Territorial Unit:</b> LUZ. Urban Audit defines Larger Urban Zone (Label "LUZ") as an approximation of the functional urban zone centred around the town/ city.
<b>Gaps:</b> Gaps in this indicator are related to: <ul style="list-style-type: none"> <li>i) Data are not available for HR.</li> </ul>

<b>Indicator Name: Life expectancy at the effective age of retirement (female)</b>
<b>DLM: Map 81/DFR: Map 4.26/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/ Poverty and exclusion.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>Definition:</b> This indicator expresses an estimation of years lived by women after the effective retirement age for women. It was calculated by subtracting the effective age of retirement from the life expectancy at birth.  Data of life expectancy at birth is defined by EUROSTAT as the mean number of years that a newborn child can expect to live if subjected throughout his life to the current mortality conditions (age specific probabilities of dying).  The average effective for most of the EU27 was calculated by the OECD and can be directly download from the OECD webpage. According to the OECD the average effective age of retirement is defined as the average age of leaving the labour force during a 5-year period. Labour force (net) exits are estimated by taking the difference in the participation rate for each 5-year age group (40 and over) at the beginning of the period and the rate for the corresponding age group aged 5-years older at the end of the period.
<b>Unit:</b> Total years alive after the effective retirement age.
<b>Source:</b> SIESTA calculations using the following datasets:  (i) Life expectancy data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a> . Data for BA DATA for BA was downloaded from the World Bank webpage.  (ii) Real retirement ages were directly downloaded from the OECD web page: <a href="http://www.oecd.org/els/employmentpoliciesanddata/ageinqandemploymentpolicies-statisticsonaverageeffectiveageofretirement.htm">http://www.oecd.org/els/employmentpoliciesanddata/ageinqandemploymentpolicies-statisticsonaverageeffectiveageofretirement.htm</a> .
<b>Year:</b> EUROSTAT life expectancy data are for 2008. The average official age of retirement is 2004-2009.
<b>NUTS level:</b> NUTS 2.
<b>Gaps:</b> Gaps in this indicator are related to:  (i) No data available for effective age of retirement for: CY, MT, LI, BG, HR, AL, BA, XK, RS, ME and MK (ii) No data available of Life expectancy at birth for the following regions: DE41, DE42 and FR91.

<b>Indicator name: Life expectancy at the official age of retirement (female)</b>
<b>DLM: Map 81</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/ Poverty and exclusion.
<b>The indicator was included in the Final Atlas:</b> <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
<p><b>Definition:</b> This indicator expresses an estimation of years lived by women after the official retirement age for women. It was calculated by subtracting the official age of retirement from the life expectancy at birth.</p> <p>Data of life expectancy at birth is defined by EUROSTAT as the mean number of years that a newborn child can expect to live if subjected throughout his life to the current mortality conditions (age specific probabilities of dying).</p> <p>The official age corresponds to the age at which a pension can be received irrespective of whether a worker has a long insurance record of years of contributions. The indicator Healthy Life Years (HLY) at birth measures the number of years that a person at birth is still expected to live in a healthy condition. These data were obtained from the OECD webpage where several Statistics on average effective age and official age of retirement in OECD countries are available.</p>
<b>Unit:</b> Total years alive after the official retirement age.
<p><b>Source:</b> SIESTA calculations using the following datasets:</p> <p>(i) Life expectancy data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a>. Data for BA DATA for BA was downloaded from the World Bank webpage.</p> <p>(ii) Official retirement ages were directly downloaded from the OECD web page: <a href="http://www.oecd.org/els/employmentpoliciesanddata/ageingandemploymentpolicies-statisticsonaverageeffectiveageofretirement.htm">http://www.oecd.org/els/employmentpoliciesanddata/ageingandemploymentpolicies-statisticsonaverageeffectiveageofretirement.htm</a>. Official retirement ages for Latvia and Lithuania were obtained in Romans, F. (2007): "The transition of women and men from work to retirement", Statistics in Focus., 97/2007. Available at: <a href="http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-07-097/EN/KS-SF-07-097-EN.PDF">http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-07-097/EN/KS-SF-07-097-EN.PDF</a></p>
<b>Year:</b> Life expectancy at birth data are for 2008. Official retirement ages were updated from the OECD data in May 2012.
<b>NUTS level:</b> NUTS 2.
<p><b>Gaps:</b> Gaps in this indicator are related to:</p> <p>(i) No data available for official age of retirement for: LI, BA, RS, XK and MK</p> <p>(ii) No data available of Life expectancy at birth for the following regions: DE41, DE42 and FR91</p>

<b>Indicator name: Life expectancy at the effective age of retirement (male)</b>
<b>DLM: Map 81/DFR: Map 4.27/FR: not included</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/ Poverty and exclusion.
<b>The indicator was included in the Final Atlas:</b> <input checked="" type="checkbox"/> <b>yes</b> <input type="checkbox"/> <b>no</b>
<p><b>Definition:</b> This indicator expresses an estimation of years lived by men after the effective retirement age for men. It was calculated by subtracting the effective age of retirement from the life expectancy at birth.</p> <p>Data of life expectancy at birth is defined by EUROSTAT as the mean number of years that a newborn child can expect to live if subjected throughout his life to the current mortality conditions (age specific probabilities of dying).</p> <p>The average effective for most of the EU27 was calculated by the OECD and can be directly download from the OECD webpage. According to the OECD the Average effective age of retirement is defined as the average age of leaving the labour force during a 5-year period. Labour force (net) exits are estimated by taking the difference in the participation rate for each 5-year age group (40 and over) at the beginning of the period and the rate for the corresponding age group aged 5-years older at the end of the period.</p>
<b>Unit:</b> Total years alive after the effective retirement age.
<p><b>Source:</b> SIESTA calculations using the following datasets:</p> <p>(i) Life expectancy data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a>. Data for BA DATA for BA was downloaded from the World Bank webpage.</p> <p>(ii) Real retirement ages were directly downloaded from the OECD web page: <a href="http://www.oecd.org/els/employmentpoliciesanddata/ageingandemploymentpolicies-statisticsonaverageeffectiveageofretirement.htm">http://www.oecd.org/els/employmentpoliciesanddata/ageingandemploymentpolicies-statisticsonaverageeffectiveageofretirement.htm</a>.</p>
<b>Year:</b> Live expectancy at birth data are for 2008. The average official age of retirement is 2004-2009.
<b>NUTS level:</b> NUTS 2.
<p><b>Gaps:</b> Gaps in this indicator are related to:</p> <p>(i) No data available for effective age of retirement for: CY, MT, LI, BG, HR, AL, BA, XK, RS, ME and MK.</p> <p>(ii) No data available of Life expectancy at birth for the following regions: DE41, DE42 and FR91.</p>

<b>Indicator name: Life expectancy at the official age of retirement (male)</b>
<b>DLM: Map 81</b>
<b>EU headline target:</b> No.
<b>ESPON Territorial Indicator:</b> No.
<b>Priority/ATLAS Subsection:</b> Inclusive Growth/ Poverty and exclusion.
<b>The indicator was included in the Final Atlas:</b> <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
<p><b>Definition:</b> This indicator expresses an estimation of years lived by men after the official retirement age for men. It was calculated by subtracting the official age of retirement from the life expectancy at birth.</p> <p>Data of life expectancy at birth is defined by EUROSTAT as the mean number of years that a newborn child can expect to live if subjected throughout his life to the current mortality conditions (age specific probabilities of dying).</p> <p>The official age corresponds to the age at which a pension can be received irrespective of whether a worker has a long insurance record of years of contributions. The indicator Healthy Life Years (HLY) at birth measures the number of years that a person at birth is still expected to live in a healthy condition. These data were obtained from the OECD webpage were several Statistics on average effective age and official age of retirement in OECD countries are available.</p>
<b>Unit:</b> Total years alive after the official retirement age.
<p><b>Source:</b> SIESTA calculations using the following datasets:</p> <p>(i) Life expectancy data were directly downloaded from the EUROSTAT statistics Database Web site: <a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database</a>. Data for BA DATA for BA was downloaded from the World Bank webpage.</p> <p>(ii) Official retirement ages were directly downloaded from the OECD web page: <a href="http://www.oecd.org/els/employmentpoliciesanddata/ageingandemploymentpolicies-statisticsonaverageeffectiveageofretirement.htm">http://www.oecd.org/els/employmentpoliciesanddata/ageingandemploymentpolicies-statisticsonaverageeffectiveageofretirement.htm</a>. Official retirement ages for Latvia and Lithuania were obtained in Romans, F. (2007): "The transition of women and men from work to retirement", Statistics in Focus., 97/2007. Available at: &lt;<a href="http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-07-097/EN/KS-SF-07-097-EN.PDF">http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-07-097/EN/KS-SF-07-097-EN.PDF</a>&gt;</p>
<b>Year:</b> Live expectancy at birth data are for 2008. Official retirement ages were updated form the OECD data in May 2012.
<b>NUTS level:</b> NUTS 2.
<p><b>Gaps:</b> Gaps in this indicator are related to:</p> <p>(iii) No data available for official age of retirement for: MT, LI, BA, RS and XK.</p> <p>(iv) No data available of Life expectancy at birth for the following regions: DE41, DE42 and FR91</p>

# 5. Development of an Aggregate Index on the Achievement of the EU2020S by NUTS2 Regions

## 5.1. Introduction to the EU2020S Index

In order to achieve an overall impression of the position of the European regions in relation to the eight headline targets of the EU2020S, an aggregate index has been calculated. This aggregate index is inspired by the Lisbon index facilitated by the 5<sup>th</sup> Cohesion Report<sup>90</sup>. The EU2020S index estimates the position of regions at NUTS2 level in relation to the EU2020S headline targets by measuring the distance to regions are from achieving these eight targets. A region would score 100 if it had reached all eight headline targets, whereas a region would score 0 if it was positioned the farthest away in all eight headline targets. When a headline is achieved, the region scores the maximum for this headline, but it does not overpass this top threshold. The definition of the indicators and the related targets are specified in table 17.

**Table 17 HTIs and Targets to be reached in 2020**

HTIs	EU2020S target
Persons aged 30-34 with tertiary education attainment	At least 40% of 30-34-year-olds completing third level education.
Early leavers (aged 18-24) from education and training	Reducing school drop-out rates below 10%
People at risk of poverty or social exclusion	At least 20 million fewer people in or at risk of poverty and social exclusion.
Employment rate of the population 20-64	75% of the 20-64 year-olds to be employed
Gross domestic expenditure on R&D	3% of the EU's GDP (public and private combined) to be invested in R&D/innovation.
Greenhouse gas emissions, base year 1990	Greenhouse gas emissions 20% (or even 30%, if the conditions are right) lower than 1990
Share of renewable energy in gross final energy consumption	20% of energy from renewable sources
Energy intensity of the economy	20% increase in energy efficiency.

The aggregate index developed is envisaged to be extremely helpful for a global appraisal of what the situation is in each individual region in relation to the EU2020S and it is going to constitute a commented map of the Atlas itself (see point 3.3.1). In this sense, the index is simple and

90 European Commission (2010: 196). The geographical dimension of the Lisbon Strategy was considered by the ESPON Project 3.3 in ESPON 2006. Available at: <[http://www.espon.eu/main/Menu\\_Projects/Menu\\_ESPON2006Projects/Menu\\_CoordinatingCrossThematicProjects/lisbonstrategy.html](http://www.espon.eu/main/Menu_Projects/Menu_ESPON2006Projects/Menu_CoordinatingCrossThematicProjects/lisbonstrategy.html)> (Access 2011-11-20).

easy, but has a clear readability potential for policymakers, who will appreciate the geographical imbalances related to the EU2020S achievement. Following the example of the Lisbon index as available in the 5<sup>th</sup> Cohesion Report, it has been essayed to calculate the trend of the evolution of the EU2020S index for the last decade.

## **5.2. Building the EU2020S Index: Data Sources and Data Quality**

In relation to building the EU2020S index, the first point to mention is that for some particular headline target indicators (HTIs) the datasets are not available at regional scale and that means that the index has been built by using the state level, as reported in Table 18. A case in point is the indicator on people at risk of poverty, for which there are different levels of resolution (NUTS 2, NUTS1 and NUTS0 or member state), depending on the case.

The second point to consider is that the EU2020S index has been calculated by taking into account the targets defined for the EU as a whole. This is consistent with the fact that not all the member states are currently facilitating national targets and indeed it seems inappropriate to use different targets across the European space in the context of a comprehensive aggregate index. The countries outside the EU do not have national targets and the EU target is not obviously applicable therein, thus they were not included in the analysis.

In terms of data sources, it has to be mentioned that the datasets are basically available at EUROSTAT, with slight differences that are going to be developed. Data at NUTS 2 level for the indicators "Early-leavers for education and training aged 20-24" and "People aged 30-34 with tertiary education" were provided by EUROSTAT via web query. The indicators "people at risk of poverty or social exclusion" and "Employment rate of the population 20-64" were directly downloaded from the EUROSTAT webpage (Regional statistics). The three indicators on energy and environment were download from the EUROSTAT webpage section "EU 2020 indicators"; these latter are currently only available at state level and the indicator on poverty and social exclusion has also much data only at state level. This lack of data at regional level of 3-4 out of the 8 EU2020S targets compromises the opportunities to get a truly regional impression of the current state and evolution of the strategy and strongly restrict the possibilities of applying multivariate statistics to develop the index. That means that the lack of data at regional level for the HTIs of energy and environment makes it really difficult to get a regional picture of both the

environmental quality and the energy issues of the EU. In this respect, more research is needed in the regional assessment of the EU2020S under the sustainable growth section.

**Table 18 Geographical Level, Year and Gaps of the Datasets Used to Calculate the EU 2020S Index for 2005 and 2010**

Target's indicators		Data specifications -2010	Data specifications -2005
<b>Education</b>	Persons aged 30-34 with tertiary education attainment (%)	Data at NUTS 2 level for the EU 27 for 2010.	Data at NUTS 2 level for the EU 27 for 2005. Data are not available for DK, the following DE regions: DE22 (Niederbayern), DE23 (Oberpfalz) and DEE0 (Sachsen-Anhalt)
	Early leavers (aged 18-24) from education and training (%)	Data at NUTS 2 level for the EU 27 for 2010	Data at NUTS 2 level for the EU 27 for 2005. Data are not available for DK and the following DE regions: DE22 (Niederbayern), DE23 (Oberpfalz) and DEE0 (Sachsen-Anhalt)
<b>Poverty and social exclusion</b>	People at risk of poverty or social exclusion (percentage of total population)	Data at NUTS 2 level for the EU 27 for 2010 with the exception of AT, DE, NL, PT and FR whose data are only available at state level and BE, EL and HU, whose data are available at NUTS 1 level.	Data at NUTS 2 level for the EU 27 for 2005 with the exception of AT, DE, NL, PT and FR whose data are only available at state level and BE, EL and HU, whose data are available at NUTS 1 level. Data for Romania and Bulgaria are not available for 2005. The closest available year is 2006 for Bulgaria and 2007 for Romania
<b>Employment</b>	Employment rate of the population 20-64 (%)	Data at NUTS 2 level for the EU27.	Data at NUTS 2 level for the EU27. Data are not available for: DK
<b>R &amp; D / innovation</b>	Gross domestic expenditure on R&D (% of GDP)	Data at NUTS 2 level for 2009. Data for the German regions DE22 and DE23 were not available. Data for Greece is not available for 2010. The most recent year is 2007	In the case of the data to calculated the index for 2010: In the case of 2005 data: Data were not available for: *DK regions * the German regions: DE22, DE23 Data for 2005 were not available for the following countries: FR and AT (data for 2004 were used instead) and BE and CZ (data for 2006 were used instead)
<b>Climate change /energy</b>	Greenhouse gas emissions (base year 1990)	Data only available at national level. 2010	Data only available at national level. 2005
	Share of renewable energy in gross final energy consumption (%)	Data only available national level. Data for all the countries is for 2010 with the exception of BE, FR and HU whose data are not available for 2010 and data for 2009 were used instead.	Data only available national level. Data are not available for 2005, 2006 data has been used instead.
	Energy intensity of the economy: Gross inland consumption of energy divided by GDP (kilogram of oil equivalent per 1 000 Euro) (calculated as index 1995=100, index 2000=100)	Data only available national level. 2010	Data only available national level. 2005

It is worthwhile mentioning the difficulties associated with specifically estimating the distance of the EU27 countries or regions from the headline target on energy efficiency. The 20% target in energy efficiency translates into a saving of 368 million tons of oil equivalent (Mtoe) by 2020



compared to projected consumption in that year of 1842 Mtoe. To project possible future development as regards to energy generation and consumption, PRIMES model (a market equilibrium model for energy supply and demand) was used. The PRIMES 2009 energy efficiency reference scenario includes measures that have been implemented by December 2009 and where the adopted legislative provisions are defined in such a way that there is almost no uncertainty on how they should be implemented in the future. The modeling gives an indication of the overall progress but not on the individual impacts of each measure. To reveal the progress towards reaching the target, results of this scenario can be compared with the PRIMES 2007 which could be considered as a reference for the 20% energy savings objective. The indicative 20% target on energy savings refers to projections for 2020, as estimated by the EC in its Green Paper on Energy Efficiency, which used the PRIMES baseline 2005. The baseline 2005 was a separate estimation that was not used for the target setting. The indicative target was set on the basis of a study on energy efficiency potentials. The baseline 2005 covers 25 member states, while Bulgaria and Romania were modeled separately. The PRIMES baseline 2007 already covers EU-27 and gives similar values for primary energy consumption in 2020 for 27 Member States (1970 Mtoe in 2005 baseline and 1968 Mtoe in 2007 baseline)<sup>91</sup>. The 20% savings objective agreed translates into a reduction of primary energy use by 36841 Mtoe in 2020 that needs to be achieved by the EU as a whole. No data on the PRIMES baselines for the EU countries are currently available, and this fact makes really intricate to estimate the distance of the EU countries to the target (even more in the case of data for 2005). In order to get an estimation of the position of the EU27 countries data on final energy consumption from EUROSTAT have been used. Based on this data, the year 2000 has been considered base year (index 2000=100) and then the percentage to be reduced by 2010 has been calculated with regard to the index 2000=100<sup>92</sup>.

Be that as it may, in order to avoid the problems associated with the consideration of state member level for regional entities, an aggregate index has been developed only when datasets are available at the regional scale (at NUTS2). Logically, this is a more realistic picture, but the big problem is that in this approximation, data on sustainable growth are omitted because of lack of data availability and the same is applicable for the issue of poverty (under the inclusive growth pillar).

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91 Communication From the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Commission Staff Working Document. Energy Efficiency Plan 2011. Brussels, 8.3.2011 SEC(2011) 277 final. <<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SEC:2011:0277:FIN:EN:PDF>> (Access 2012-07-25).

92 We have established an index 1995=100 for the calculation of the EU2020S index for the year 2005.

The last mention to make is that in order to grasp the temporal evolution of the EU2020S it has been essayed to calculate the trend. This is consistent with the 5<sup>th</sup> Cohesion Report, which estimated the Lisbon Index for the period 2000-2008. In addition, this was specifically required by ESPON CU in the meeting in mid-May 2012. Unfortunately, there are no available data for the years 1999-2005 for some of the headline targets which were amalgamated into the EU2020S index and this makes it impossible to obtain an indicator on the change in the EU2020S index for the last decade which would be extremely interesting to understand which regions are improving and which are worsening in relation to the EU2020S headline targets. This is applicable to regions, but also to states. For regions, there are datasets for 2005 for the 4 HTIs that are available at the regional scale, that is, excluding indicators on energy and environment; as previously reported, the indicator on poverty has an extreme variability of available scales and in each case the coarsest possible grain has been used. For states, there are datasets for 2005 and 2010 for the whole 8, with exception of the indicator "Share of renewable energy in gross final energy consumption (%)", for which the most recent year available is 2006; Table 18 includes the data specifications for the calculations of the EU2020S index at country and regional level both for 2005 and 2010 while tables 19, 20, 21 and 22 show the top and bottom regions scoring in the EU2020S index in 2005 and 2010 and the top and bottom countries scoring in the EU2020S index in the 2005 and 2010 respectively. Finally, tables 23 and 24 show the top and bottom regions scoring in the EU2020S index calculated excluding the environmental and energy indicators in 2005 and 2010 respectively. Table 23 shows that in 2010 two German regions (Oberbayern and Dresden) and three Swedish regions (Östra Mellansverige, Sydsverige and Västsverige) have overpassed the four targets on research and education.

**Table 19 EU2020S Index Top and Bottom Regions in 2005 (Combining 8 Indicators)**

<b>Ten highest -8 indicators- 2005</b>		
SE	Stockholm	92.77
SE	Sydsverige	92.58
SE	Östra MGRlansverige	92.18
SE	Västsverige	92.02
SE	Övre Norrland	91.73
FI	EtGRä-Suomi	89.89
FI	Länsi-Suomi	88.26
FI	Pohjois-Suomi	87.08
DE	Oberbayern	85.38
DE	Stuttgart	83.69
<b>Ten lowest -8 indicators- 2005</b>		
EL	Ionia Nisia	40.02
IT	Sardegna	39.92
ES	Andalucía	39.89
IT	Campania	38.30
ES	Extremadura	38.10
IT	Calabria	36.62
IT	Puglia	36.02
IT	Sicilia	34.19
MT	Malta	34.11
ES	Ceuta	28.33

**Table 20 EU2020S Index Top and Bottom Regions in 2010 (Combining 8 Indicators)**

<b>Ten highest -8 indicators- 2010</b>		
SE	Östra Mellansverige	93.35
SE	Sydsverige	93.35
SE	Västsverige	93.35
SE	Stockholm	93.21
SE	Övre Norrland	92.58
FI	Etelä-Suomi	90.74
FI	Länsi-Suomi	89.99
DE	Oberbayern	89.59
DE	Dresden	89.59
FI	Pohjois-Suomi	88.16
<b>Ten lowest -8 indicators- 2010</b>		
HU	Észak-Magyarország	46.71
IT	Sardegna	44.87
IT	Basilicata	43.22
ES	Melilla	39.35
IT	Puglia	38.11
IT	Calabria	37.54
IT	Campania	34.40
ES	Ceuta	34.00
MT	Malta	33.81
IT	Sicilia	32.68

**Table 21 EU2020S Index Top and Bottom Countries in 2005 (Combining 8 Indicators)**

<b>Five highest -8 indicators- 2005</b>		
SE	Sweden	94.46
FI	Finland	91.41
DK	Denmark	88.78
AT	Austria	75.46
NL	Netherlands	74.77
<b>Five lowest -8 indicators- 2005</b>		
MT	Malta	23.04
IT	Italy	38.82
PL	Poland	41.97
RO	Romania	45.22
GR	Greece	45.44

**Table 22 EU2020S Index Top and Bottom Countries in 2010 (Combining 8 Indicators)**

<b>Five highest -8 indicators- 2010</b>		
SE	Sweden	95.43
FI	Finland	93.67
DK	Denmark	87.95
DE	Germany	81.87
AT	Austria	79.66
<b>Five lowest -8 indicators- 2010</b>		
MT	Malta	19.83
IT	Italy	40.07
RO	Romania	40.37
HU	Hungary	46.14
BG	Bulgaria	50.85

**Table 23 EU2020S Index Top and Bottom Regions in 2005 (Combining 4 Indicators)**

<b>Ten highest -4 indicators- 2005</b>		
UK	Berkshire, Buckinghamshire and Oxfordshire	99.59
FI	EtGRä-Suomi	99.55
BE	Vlaams-Brabant	98.33
UK	Bristol/Bath area	97.90
SE	Stockholm	97.88
SE	Sydsverige	97.50
SE	Östra MGRlansverige	96.71
SE	Västsverige	96.37
UK	Cheshire	96.34
FI	Länsi-Suomi	96.29
<b>Ten lowest -4 indicators- 2005</b>		
BG	Severozapaden	33.85
MT	Malta	31.00
RO	Sud-Est	30.11
IT	Campania	30.06
IT	Calabria	29.05
IT	Sardegna	26.31
IT	Sicilia	25.64
ES	Ceuta	25.46
IT	Puglia	24.68
PT	Região Autónoma dos Açores	23.24

**Table 24 EU2020S Index Top and Bottom Regions in 2010 (Combining 4 Indicators)**

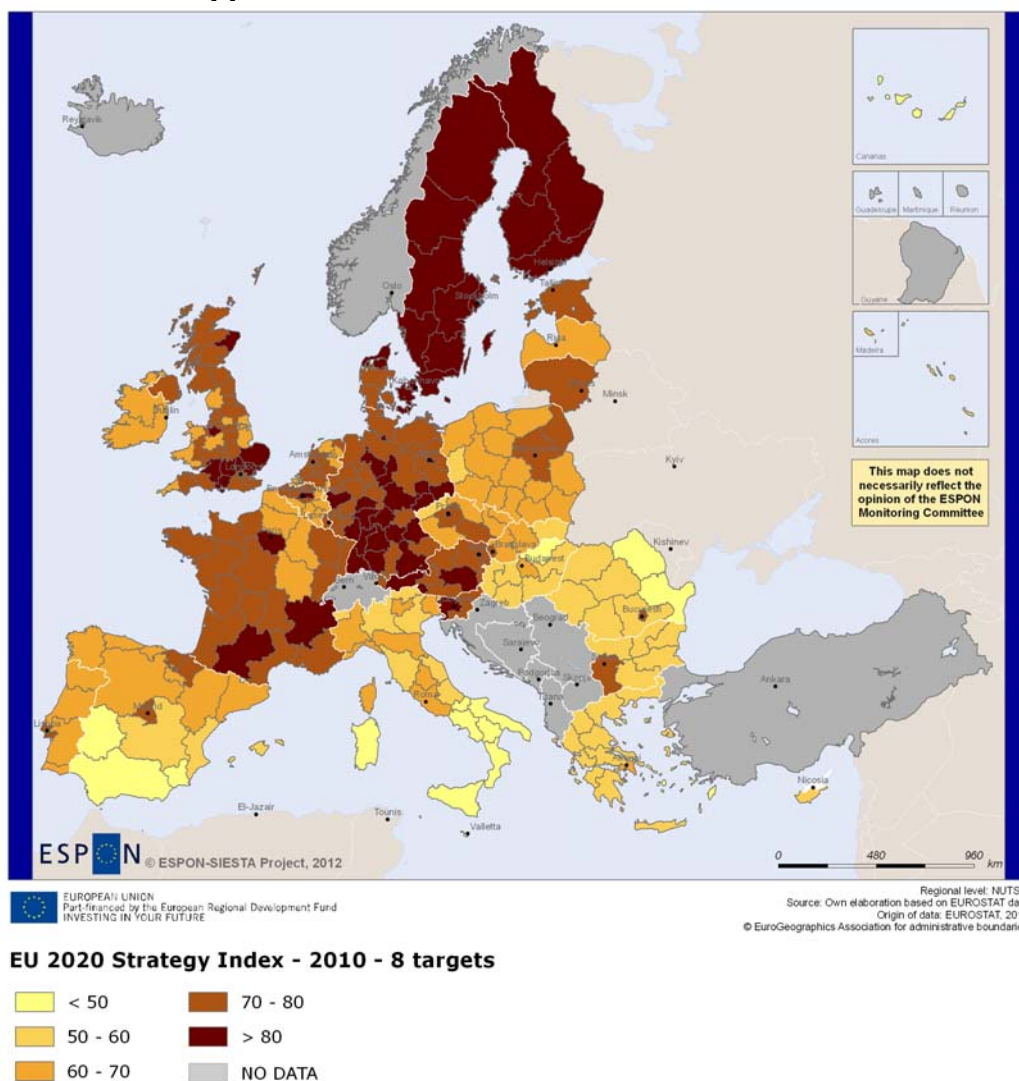
<b>Ten highest -4 indicators- 2010</b>		
DE	Oberbayern	100
DE	Dresden	100
SE	Östra Mellansverige	100
SE	Sydsverige	100
SE	Västsverige	100
FI	Etelä-Suomi	99.93
SE	Stockholm	99.72
DK	Hovedstaden	99.57
DK	Nordjylland	99.36
UK	Gloucestershire, Wiltshire and Bristol/Bath area	99.29
<b>Ten lowest -4 indicators- 2010</b>		
IT	Sardegna	35.39
IT	Calabria	34.23
EL	Notio Aigaio	33.99
MT	Malta	32.99
IT	Puglia	30.48
IT	Campania	29.50
PT	Região Autónoma dos Açores	28.85
IT	Sicilia	27.41
ES	Melilla	24.07
ES	Ceuta	19.16

Finally, it has to be reiterated that in some of the datasets that have been used in this section, as in the other parts of this project, there are several values accounting for problems of reliability according to EUROSTAT itself. This is especially the case of the data at NUTS2 for HTI on education, given that data are derived from small a sample size for several regions. This is applicable for 2005 and for 2010. For more details in this respect see table 13 and section 4.2.3.

To sum up, the maps elaborated for the EU2020S index are the following ones:

- **Map 8** shows the aggregate index at regional NUTS2 level for 2010, based on the 8 applicable HTIs (including the 3 available at state member level and 1 at several scales).
- **Map 9** shows the aggregate index at regional NUTS2 level for 2005, based on the 8 applicable HTIs (including the 3 available at state member level and 1 at several scales).
- **Map 10** shows the change 2005-2010 of the aggregate index at regional NUTS2 level, based on the 8 HTIs (including the 3 available at state member level and 1 at several scales).
- **Map 11** shows the aggregate index at regional NUTS2 level for 2010, based on the 4 HTIs available at regional scale.
- **Map 12** shows the aggregate index at regional NUTS2 level for 2005, based on the 4 HTIs available at regional scale.
- **Map 13** shows the change 2005-2010 of the aggregate index at regional NUTS2 level, based on the 4 HTIs available at regional scale.
- **Map 14** shows the aggregate index at member state level for 2010, based on the 8 HTIs.
- **Map 15** shows the aggregate index at member state level for 2005, based on the 8 HTIs.
- **Map 16** shows the change 2005-2010 of the aggregate index at member state level, based on the 8 HTIs.

**Map 8 EU2020S Aggregate Index at Regional NUTS2 level for 2010, Based on the 8 Applicable HTIs**

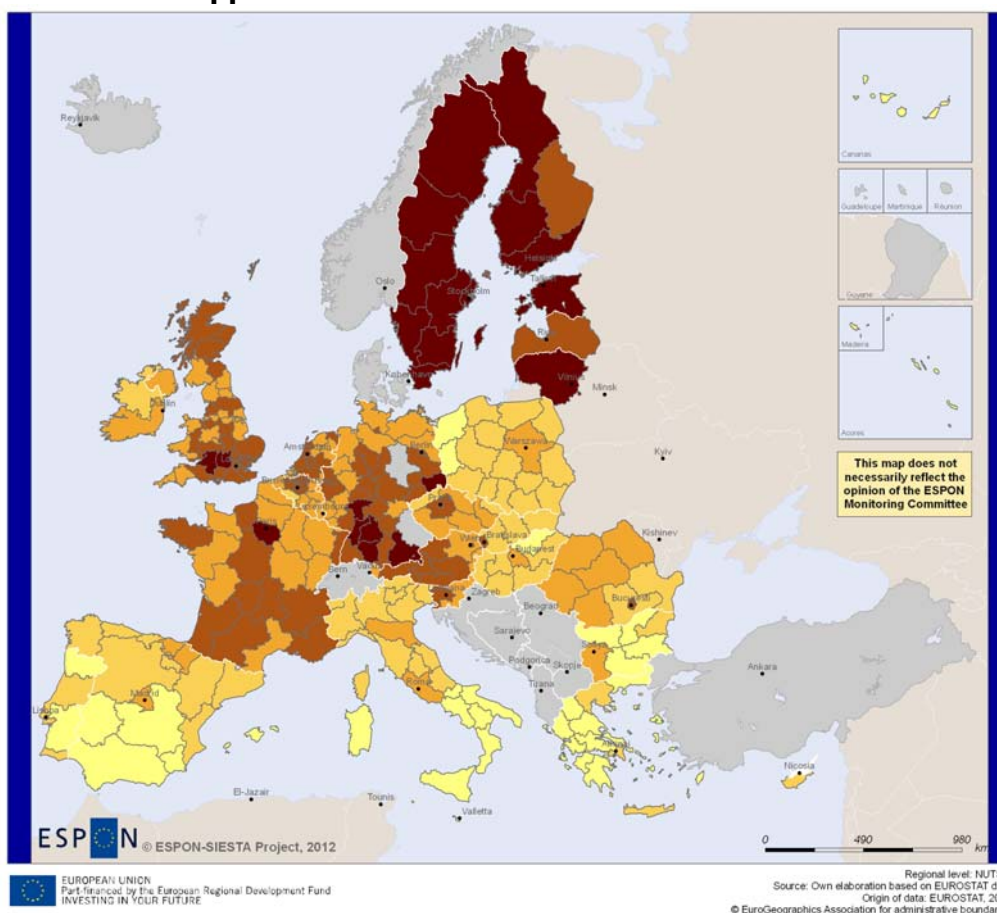


This map shows that top positions in the achievement of the regional EU2020S aggregate index for 2010 are all Scandinavian regions, plus Southern Germany, several French regions and South England (basically, North of London, but also Hampshire). This pattern is broadly coincident with two of the three corridors repeatedly defined in relation to R&D performance: Midi-Pyrénées to Southern Germany and Denmark to Finland. Some capital regions (Île-de-France, Greater London, Berlin, Brussels, Copenhague, Ljubljana) score particularly high as well and are included in the group of regions above 80%. The third corridor which is usually defined (between Austria and London) is less clear herein, because there are regions scoring relatively poor in relation to their neighbouring geographical units (i.e. Wallonie in Belgium and Picardie or Nord-Pas-de-Calais in France).

In contrast, bottom positions lay in Eastern Romania, Észak-Magyarország (Hungary), Southern Italy and Southern Spain, plus Spanish outermost

regions; some of these regions lagging behind score less than 40%. In Spain or Romania, there are dramatic imbalances between regions. In general, Eastern Europe tends to score worse than Western Europe and the Iron Curtin seems to still be quite easily appreciable, although the Eastern capital regions score better in general and have already attained average EU values: Mazowieckie-Warsaw in Poland, Közép-Magyarország-Budapest in Hungary, Yugozapaden-Sofia in Bulgaria, etc.

**Map 9 EU2020S Aggregate Index at Regional NUTS2 Level for 2005, Based on the 8 Applicable HTIs**



**EU 2020 Strategy Index - 2005**

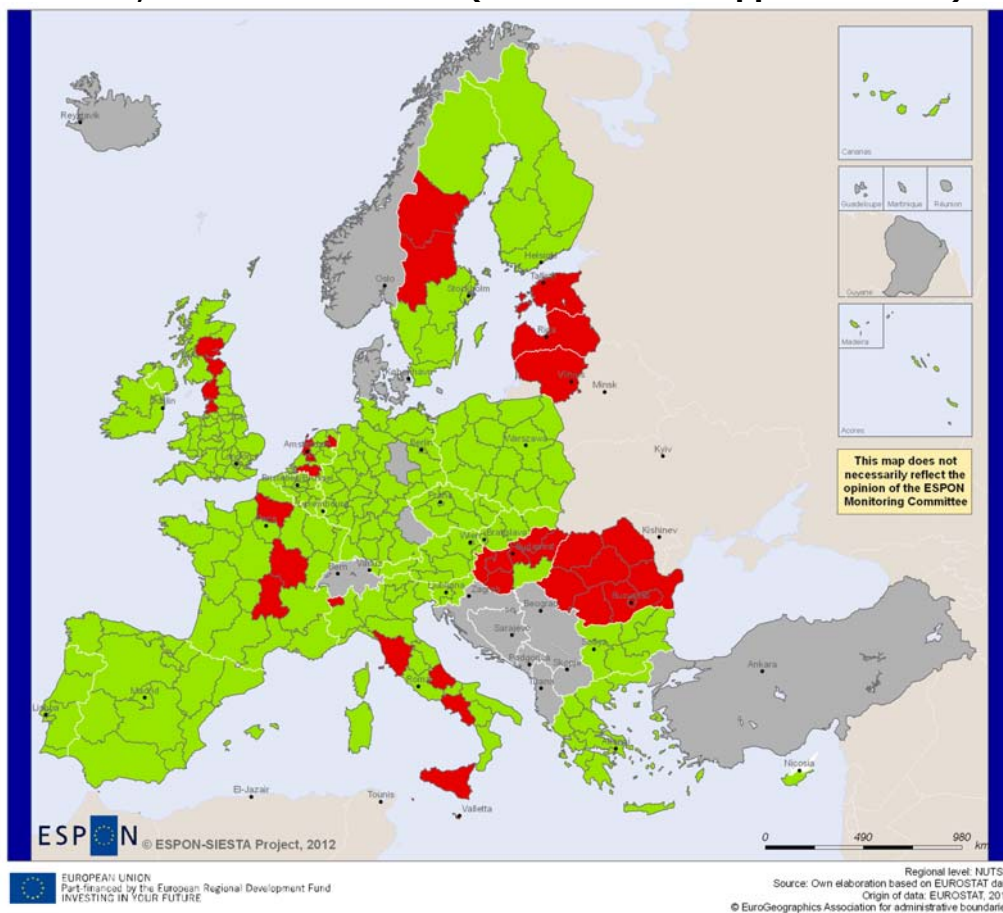
<span style="display:inline-block; width:15px; height:15px; background-color:yellow; border:1px solid black;"></span> < 50	<span style="display:inline-block; width:15px; height:15px; background-color:darkorange; border:1px solid black;"></span> 70 - 80
<span style="display:inline-block; width:15px; height:15px; background-color:orange; border:1px solid black;"></span> 50 - 60	<span style="display:inline-block; width:15px; height:15px; background-color:darkred; border:1px solid black;"></span> > 80
<span style="display:inline-block; width:15px; height:15px; background-color:lightorange; border:1px solid black;"></span> 60 - 70	<span style="display:inline-block; width:15px; height:15px; background-color:grey; border:1px solid black;"></span> NO DATA

This map 9 is arguably consistent with the previous one in the sense that the Scandinavian regions (plus Southern Germany) are in top positions and Southern regions are in the bottom ones. However, in general all the regions in the map score less than in 2010, demonstrating that there has been an overall positive evolution between 2005 and 2010. Be that as it may, there are specific situations that might require a specific analysis. For instance, Eastern Baltic States were in 2005 in quite a good situation,



at the same level as the Scandinavian geographical units, but they have lost this positive ranking by 2010, according to the previous map. In contrast, in Eastern Europe several regions were lagging behind, but they have progressed quickly because 5 years later they have clearly improved. Be that as it may, the fact that the aggregate index on this map is combines regionalised datasets with datasets at the state level seriously compromises, like in the previous picture, its understanding.

**Map 10 Change 2005-2010 of the EU2020S Aggregate Index at Regional NUTS2 level, Based on the 8 HTIs (Based on the 8 Applicable HTIs)**



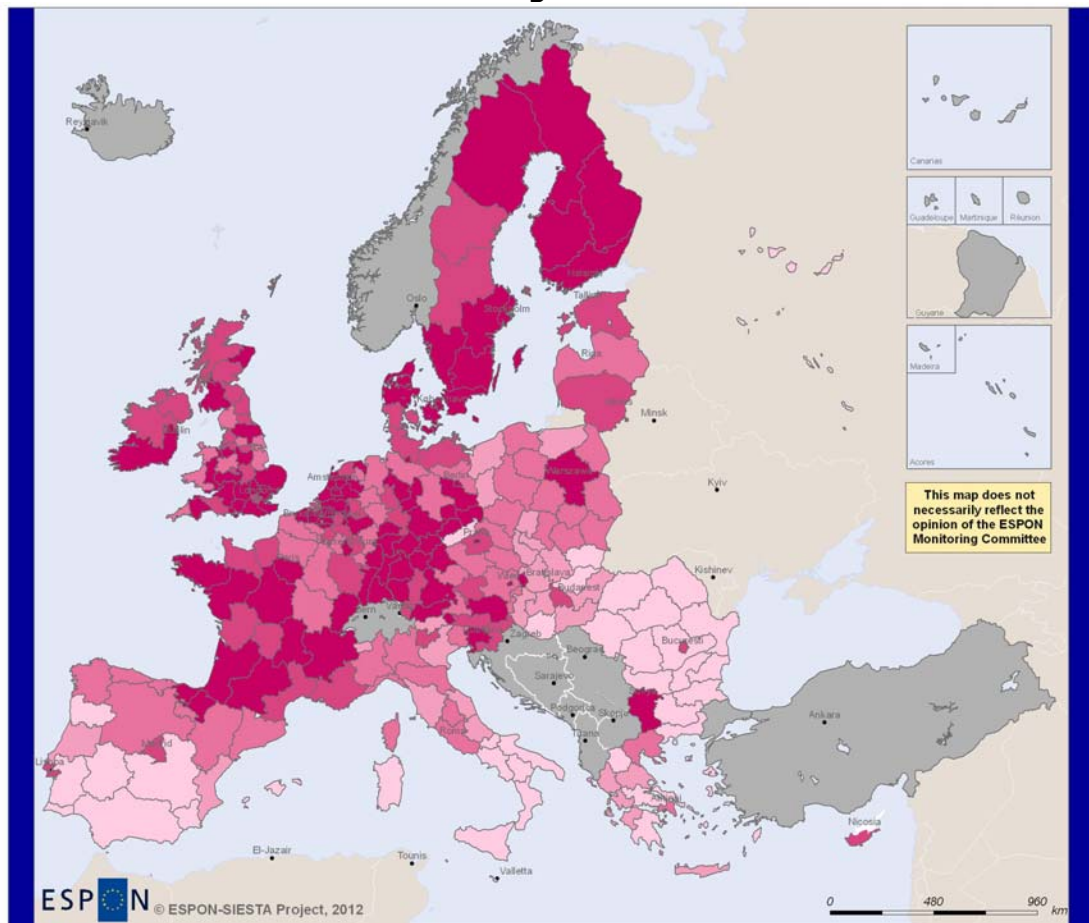
**EU 2020 Strategy Index - change 2005-2010 - 8 targets**

- Worsening
- Improving
- NO DATA

This map 10 is the obvious consequence of the previous ones. In general, the EU2020S implementation seems to improve. However, this is not really occurring if the aggregate indicators are disaggregated into two blocks (environmental, on the one hand, and social, on the other). But this disaggregation is only acceptable at the state scale level (map 15) given that environmental indicators are only available by countries. In addition, this indicator reflects the contradictions of the EU2020S in the

sense that several issues have been amalgamated therein and these issues have contradictory behaviours among them. Importantly, in Hungary and Romania all the regions of the country (or almost all of them) are having the same behaviour and this expresses that the national indicators are the ones driving regional change, which means that the aggregate map is inconsistent in its very nature.

**Map 11 EU2020S Aggregate Index at Regional NUTS2 Level for 2010, Based on the 4 HTIs Available at Regional Scale**



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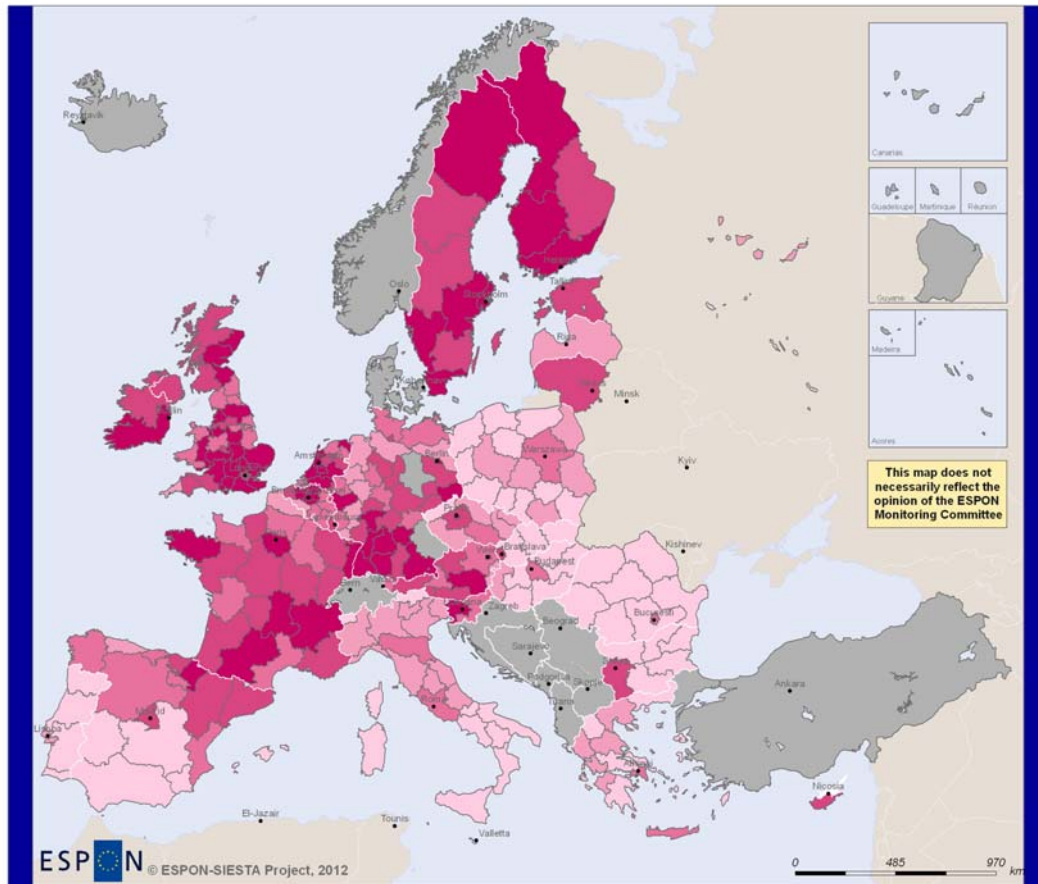
Regional level: NUTS 2  
 Source: Own elaboration based on EUROSTAT data  
 Origin of data: EUROSTAT, 2012  
 © EuroGeographics Association for administrative boundaries

**EU 2020 Strategy Index - 2010 - 4 indicators**

- < 50
- 50 - 60
- 60 - 70
- 70 - 80
- > 80

This map 11 is interesting as it is a truly representation of the regional situation (based on 4 out of 8 headline indicators with datasets at the regional level) for 2010 in relation to the EU2020S.

**Map 12 EU2020S Aggregate Index at Regional NUTS2 Level for 2005, Based on the 4 HTIs Available at Regional Scale**

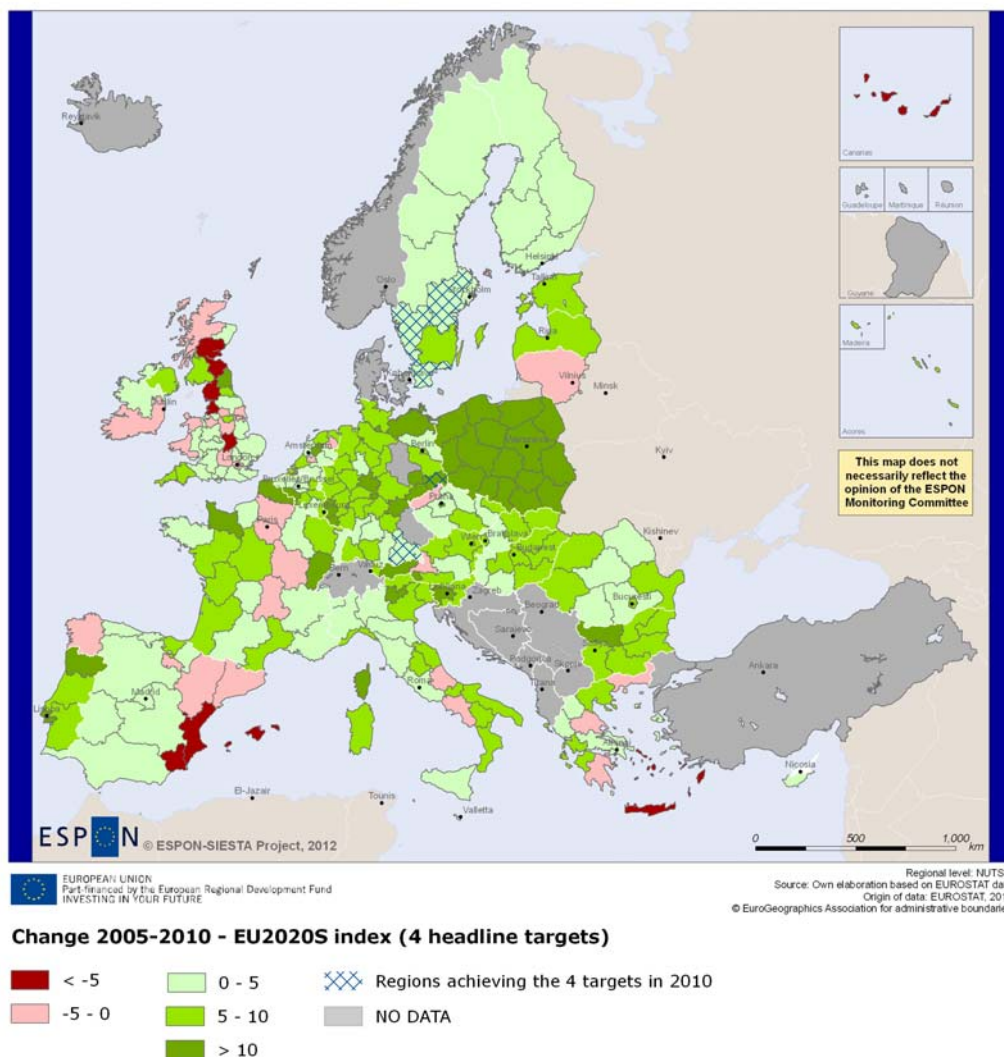


**EU 2020 Strategy Index - 2005 - 4 indicators**



In any case, this map12 is interesting as it is a truly representation of the regional situation (based on 4 out of 8 headline indicators with datasets at the regional level) for 2005 in relation to the EU2020S.

**Map 13 Change 2005-2010 of the EU2020S Aggregate Index at Regional NUTS2 level, Based on the 4 HTIs Available at Regional Scale**

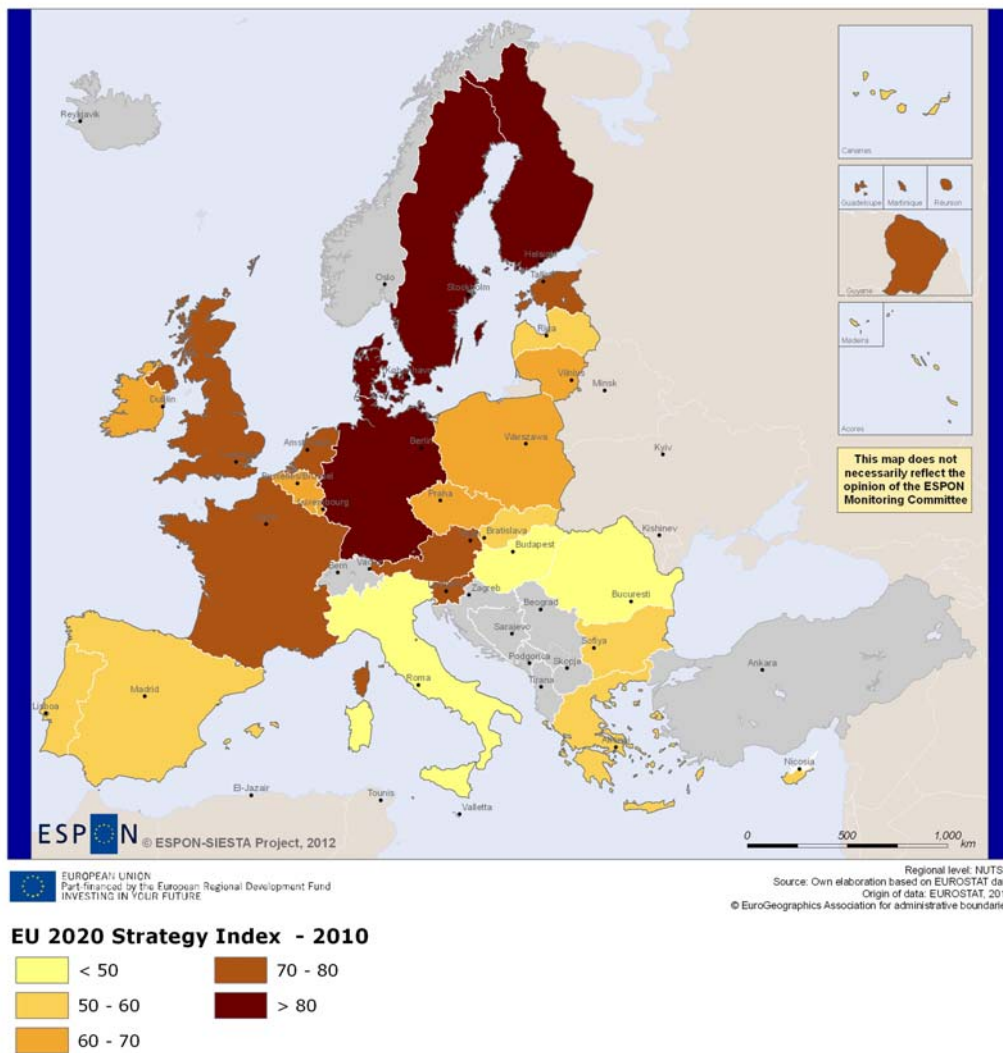


Although the pattern is not absolutely evident in this map 13, the important question to retain from this map is that Eastern and Central European regions (plus Portugal) progress, notably Poland, while Scandinavian and Southern European regions remain stable, but it has to be highlighted that the former are on top and that means that progress is statistically difficult to take place, while the latter are scoring poorly (see map 10). It is worthwhile mentioning that in 2010 there are 5 regions that score 100%, meaning that the 4 considered targets have already been reached therein: Västsverige, Sydsverige and Östra Mellansverige in Sweden, and Dresden and Oberbayern in Germany.

The regions that are decreasing their position are mainly in Greece, Eastern Spain (plus Galicia and the Spanish outermost regions), France, Lithuania and the British Isles. The causes associated with this upgrading are diverse: in some cases it is because of increasing levels of unemployment (especially, the case of Southern Europe), while in others

the resting variables are more important. Because of its consistency, this map has been selected for the Atlas.

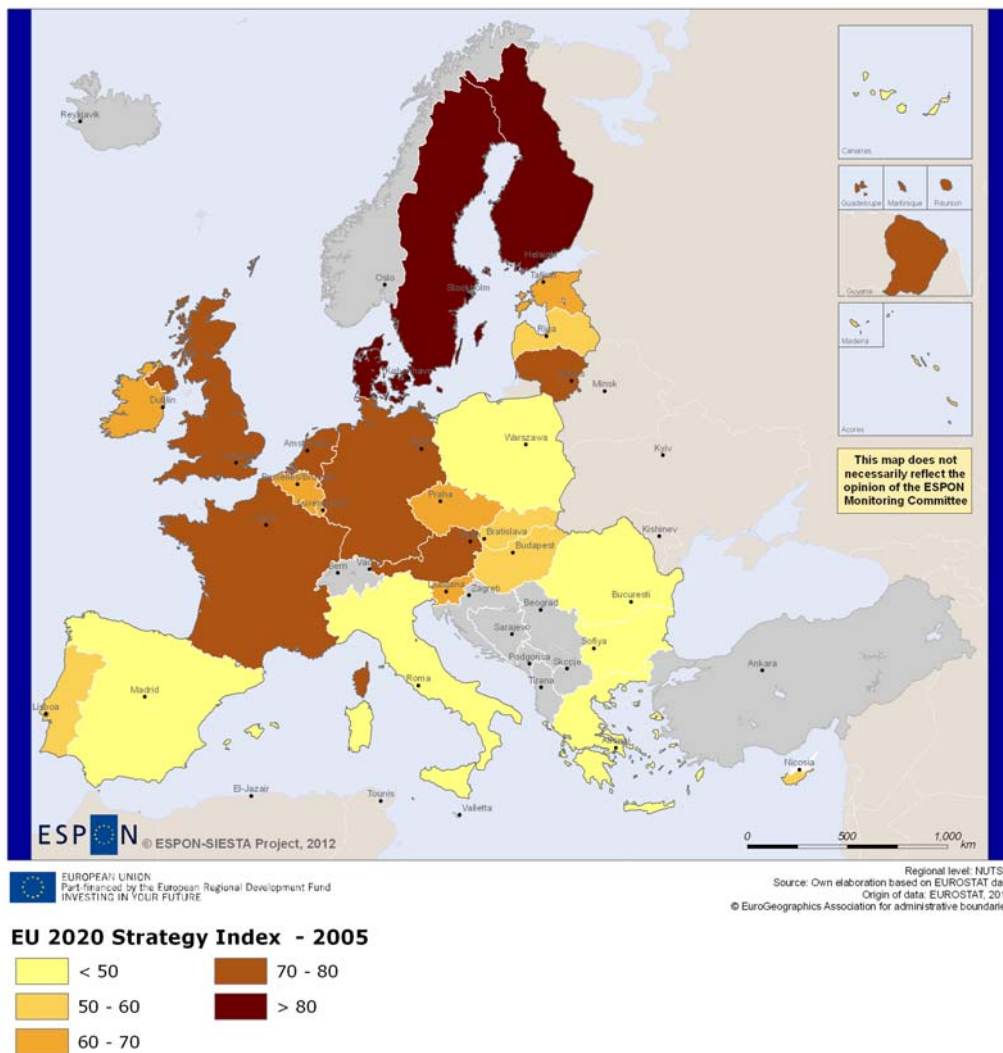
**Map 14 EU2020S Aggregate Index at Member State Level for 2010, Based on the 8 HTIs**



This map 14 is conceptually well-designed in the sense that data are at the same scale as is represented, while map 7 used 3 of these national datasets as if they were regional. However, map 7 has been considered more interesting to be included in the Atlas because it is the precise objective of the SIESTA Project: to appraise the regional dimension of the EU2020S, even if some of the datasets are national rather than regional. In contrast, this map is at state member level. In addition, because map 15 is a trend between this map and map 14, in the Atlas it has been considered more interesting and expressive to include map 15, which is directly embracing this one.

This map shows that the three Scandinavian countries plus Germany are the better positioned member states in relation to the EU2020S, while Hungary, Romania and Italy are the worse ranked. Indeed, Italy scores 40%, while Sweden scores 95% and that constitutes a very wide range concerning where each one of the countries is located and shows how the EU2020S is far from being achieved everywhere.

**Map 15 EU2020S Aggregate Index at Member State Level for 2005, Based on the 8 HTIs**

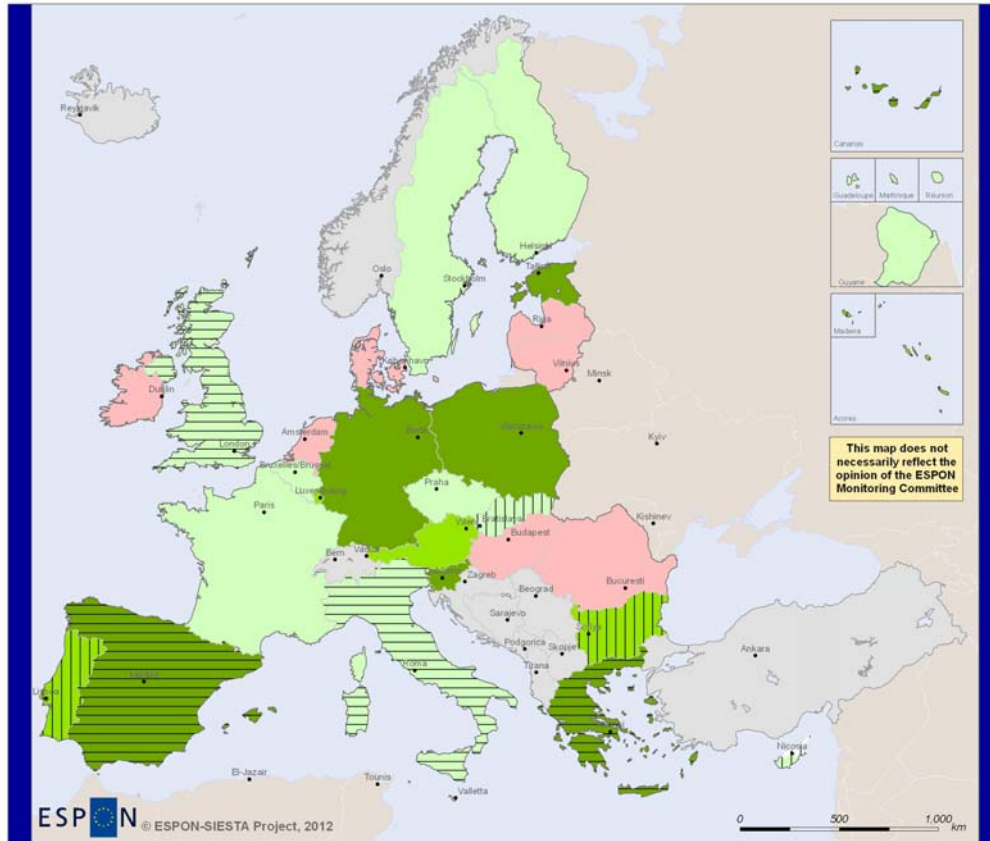


This map is 15 conceptually well designed in the sense that data is at the same scale than is represented, while map 8 used 3 of these national datasets as if they were regional. Because map 15 is a trend between this map and map 14, in the Atlas it has been considered more interesting and expressive to include map 16, which is directly embracing this one.

In relation to the latter, this map expresses huge changes, for instance in Poland or Spain, countries that have upgrading because of different

reasons (see map 16). Germany has also upgrading and now it is in the top positions.

**Map 16 Change 2005-2010 of the EU2020S Aggregate Index at Member State Level, Based on the 8 HTIs**



**EU2020S index country evolution 2005-2010**

- < 0
- 0 - 5
- 5 - 10
- > 10
- Worsening in the 3 environmental targets
- Worsening in the 5 social targets
- Non EU countries

The overall picture suggests that the EU2020S is going well in the sense that the majority of countries seem to be improving (19 out of 27). However, it has to be pointed out that 4 countries have an overall positive behaviour but in fact worsen in the 5 social headlines and 4 countries have an overall improving but in their cases the 3 environmental headlines worsen. The latter is the case of Slovakia, Cyprus, Bulgaria and Portugal and the headlines that change are in every nation different. The case of the countries worsening in the social targets is more crucial, because especially three countries (Spain, Greece and Italy) show a dramatic diminution in these issues, particularly because of an outstanding raising unemployment. In these 3 countries the improvement in environmental issues of the EU2020S statistically compensates the

distance that is being generated in relation to the EU2020S because of the social topics. But this environmental advance is artificial in the sense that is motivated for the decreasing levels of economic activity that are automatically reflected in a decline of energy consumption and of GHG emissions, so they cannot be truly considered sustainable growth, following the EU2020S standards.

### **5.3. EU2020S Index: Overall Assessment**

Although the elaboration of the EU2020S aggregate index is a compulsory task of project SIESTA we have to highlight how difficult it is interpret the resulting maps (i.e. map 7 and 8). First of all, regions that score the same on the map are very different and score high or low because of different profiles or performance in relation to the various indicators considered. That is true, but this is not a problem of the index in itself, but an issue related to the heterogeneous nature of the EU2020S, embracing several topics which differ from one another. The aggregate index is only showing the level which each region is in, but not the internal composition of each of their individual strengths or the weaknesses that do account for each region. This is not the objective of an aggregate index in its very nature. However, in order to overcome this fact, SIESTA has developed an internal disaggregation of the index (as shown in map 15), but evidently this disaggregation clashes with the very idea of an aggregate index.

In this respect, table 25 shows how relations between the eight headline targets are not obvious. In this sense, usually the analysis has been done through the division between the 3 environmental indicators and the remaining 5 indicators that might be considered "social". Map 9 is one example of an aggregation that does not work and expresses nothing, as mentioned above. The same is applicable to map 15, where for instance Spain shows an apparent positive change between 2005 and 2010 but this position/evolution is related to an achievement of the energy or environmental indicators while the distance to reach the target in the education, research and poverty headlines could be high.

If the understanding of this aggregate index is complex for one particular year, the understanding worsens when calculating the change. However, the calculation was made as a request of ESPON CU. Finally, it has been considered important to include in the Atlas only those maps on changes that are worth value (maps 12 and 15); in the case of map 15, a layer disaggregating those countries that apparently show a positive variation has been superimposed in order to allow a clearer understanding of the issue.



In addition, as has been reiterated in this Scientific Report, there is a lack of detailed research on the evolution of the environmental and energy indicators in the last years, and indeed the indicators selected as headline targets by the EU2020S are highly controversial. That means in practice that it is impossible to obtain and discuss scientific evidence of how these indicators are changing during the crisis. In other words, the maps showing the change in the EU2020S index (maps 9 and 15) could not be appropriated to make a “crisis” interpretation of the index and even the static view of the index for 2010 (map 7) could be compromised if we include the environmental and energy indicators. For this reason, map 12, showing the EU2020S index excluding the indicators on energy and the environment, gives a more realistic regional situation than map 9. Map 12 shows how most of the regions have improved their situation in the targets of education (2 targets), research and employment. A total of 40 regions out of 259 considered when calculating the change 2005-2010 have worsened; region ES64 (Melilla) shows the most dramatic and ITF1 (Abruzzo) the most moderate worsening.

**Table 25 Correlations Between the HTIs at Country Level for 2010**

<b>correlation</b>	tertiary	leavers	R&D_exp enditure	poverty	employment	GHG emissions	Renewabl e energy	Energy efficiency	GDP (pps)
tertiary		0.27	<b>0.40</b>	- 0.24	<b>0.42</b>	0.16	0.02	- 0.21	<b>0.46</b>
leavers	- 0.27		- 0.23	0.20	<b>- 0.36</b>	<b>0.42</b>	-0.11	0.16	- 0.16
R&D_expen diture	0.40	- 0.23		<b>- 0.65</b>	<b>0.69</b>	0.11	<b>0.45</b>	- 0.13	<b>0.46</b>
poverty	- 0.24	0.20	<b>- 0.65</b>		<b>- 0.60</b>	<b>- 0.41</b>	0.02	-0.04	<b>- 0.57</b>
employem t	0.42	<b>- 0.36</b>	<b>0.69</b>	<b>- 0.60</b>		0.18	0.30	-0.27	<b>0.45</b>
GHG emissions	0.16	<b>0.42</b>	0.11	-0.41	0.18		-0.27	0.07	<b>0.32</b>
Renewable energy	0.02	- 0.11	<b>0.45</b>	0.02	0.30	-0.27		- 0.11	0.18
Energy efficiency	- 0.21	0.16	- 0.13	- 0.04	- 0.27	0.07	- 0.11		0.09
GDP (pps)	<b>0.46</b>	- 0.16	0.46	<b>- 0.57</b>	<b>0.45</b>	<b>0.32</b>	- 0.18	0.09	
<b>P-values</b>	tertiary	leavers	R&D_exp enditure	poverty	employment	GHG emissions	Renewabl e energy	Energy efficiency	GDP (pps)
tertiary		0.09	<b>0.02</b>	0.12	<b>0.02</b>	0.21	0.45	0.15	<b>0.01</b>
leavers	0.09		0.12	0.16	<b>0.03</b>	<b>0.02</b>	0.30	0.21	0.21
R&D_expen diture	<b>0.02</b>	0.12		<b>0.00</b>	<b>0.00</b>	0.30	<b>0.01</b>	0.25	<b>0.01</b>
poverty	0.12	0.16	<b>0.00</b>		<b>0.00</b>	<b>0.02</b>	0.45	0.42	<b>0.00</b>
employem t	<b>0.02</b>	<b>0.03</b>	<b>0.00</b>	<b>0.00</b>		0.18	0.06	0.09	<b>0.01</b>
GHG emissions	0.21	<b>0.02</b>	0.30	0.02	0.18		0.09	0.36	<b>0.05</b>
Renewable energy	0.45	0.30	<b>0.01</b>	0.45	0.06	0.09		0.29	0.18
Energy efficiency	0.15	0.21	0.25	0.42	0.09	0.36	0.29		0.32
GDP (pps)	<b>0.01</b>	0.21	0.01	<b>0.00</b>	<b>0.01</b>	<b>0.05</b>	0.18	0.32	

# **6. Application of Multivariate Statistics to the Territorial Study of the EU2020S**

## **6.1. Introduction**

Before reaching the solution for the development of the EU2020S index explained in section 5 we look for a solution based on statistical methods of factorial analysis, namely Principal Component analysis (PCA herein). PCA is devoted to grouping together individual indicators which are collinear to form a composite indicator that captures as much as possible the information common to individual indicators (Hurdlikova and Fischer, 2011). Unfortunately, the lack of data at regional level of some the indicators to be aggregated have compromised this solution; on the other hand, Hurdlikova and Fischer (2011) have worked on the issue of aggregating Europe 2020 indicators into a composite indicator and have analysed some methods for aggregation and weighting; when they applied the PCA to the 8 EU2020S indicators they found that the correlations between indicators were relatively small, and they finally established that PCA seems inadequate because of the assumption of correlation between sub-indicators. Be that as it may, due to the limitations for using these methods to obtain the aggregated index we have to use PCA and k-mean cluster to go deep into the regional dimension of the EU2020 strategy. PCA have been applied to the overall datasets available at regional level that have been considered in our project with the aim of identifying subjacent factors to explain regional tendencies while k-mean cluster has been used to obtain groups of regions with similar properties in relation to the education, research and employment headline EU2020S targets.

## **6.2. K-mean Cluster Application to Identify Groups of Regions Based on the EU2020S Headline Indicators**

The EU2020S index has a number of limitations for representing the position of the regions with respect to the HTIs, as discussed in detail in Section 5, these problems are mainly related to the scarcity of regional data. As we have mentioned before, another "ideal" procedure to estimate the position of the regions is using factorial analysis. In this section 6.2 we will explain the results of the application of clustering methods to find

groups of regions with similar positions in the indicators of the EU2020S. Actually, the classification of the EU Regions into groups of regions with similar characteristics is a helpful tool in the study of EU2020S territorial impact. This classification might result in regional typologies that will assist policy makers in applying actions to pre-defined groups of regions sharing the same potentials and weaknesses. Unfortunately, we have to come back again to the problems with the environmental and energy indicators that are not available at regional level, so the groups of regions were only defined on the basis of the four indicators available at NUTS 2 level (i.e. Persons aged 30-34 with tertiary education attainment; Early leavers (aged 18-24) from education and training; People at risk of poverty or social exclusion; Employment rate of the population 20-64; Gross domestic expenditure on R&D). Strictly speaking, GDP per capita is not a headline target of the EU2020S. However, it has been considered in the clustering analysis because the EU2020S deals basically with promoting growth and, as has been argued in this Project; growth is commonly measured through GDP per capita

To find the appropriated groups of regions based on the variables mentioned above, we have chosen the K-mean cluster analysis that in comparison with other classification techniques, allows for a straightforward classification of regions. We applied k-means clusters as an exploratory analysis appropriated to find a correct visual solution (maps 17 and 18) that would highlight the differences on the position of the regions on these HTIs across the EU. Issues related to data quality and gaps can be consulted in section 5.2 of this report, as the datasets used for clusters analysis are the same previously used to calculate the EU2020S index.

### **6.2.1. Clustering Analysis Workflow**

The production of clusters typology is a long process that consists of several steps. First of all, we have to study the variables that we wanted to integrate into the cluster analysis to establish if all of them can be included in the analysis.

Any statistical algorithm, such as k-means clustering that works on the basis of minimising the sum of squares of some sort (here the distance from cluster centres) requires the following aspects from the input variables:

- To have a normal distribution
- To be independent from each other
- Outliers due to error or miscalculation must be removed in order to avoid biased results.

Using the statistical software SPSS v.17 the aptness of each variable has been assessed. First we have calculated both descriptive statistics and pairwise correlations of the considered variables. Tables 26 and 27 show the descriptive statistics and the correlations respectively and figure 6 the histograms drawn to study the adeptness of the variables to the normal distribution. The resulting correlations allowed discarding correlations between variables that will compromise the use of some of them. The clustering methodologies assume that variables follow a Normal distribution, but in the real world are it is usually difficult to find variables without outliers or showing marked skewness. The application of the Kolmogorov-Smirnov test to the variables proposed to be included in the clustering analysis allowed to identify that only two variables follow a normal distribution (see table 28).

**Table 26 Descriptive Statistics**

		Tertiary educated aged 30-34	Early leavers 18-24	Employment rate 20-64	R&D expenditure	GDP per capita (PPS)
N	Valid	267	267	267	267	267
	Missing	0	0	0	0	0
Mean		32.49	13.95	69.39	1.56	22622.47
Std. Deviation		10.97	7.416	7.07	1.33970	8523.37
Skewness		.141	1.44	-.82	1.887	1.66
Std. Error of Skewness		.149	.15	.15	.149	.15
Kurtosis		-.653	2.77	.74	4.540	7.9
Std. Error of Kurtosis		.30	.30	.30	.230	.30
Minimum		8.4	2.3	43.7	.10	6400
Maximum		66.0	45.2	83.6	7.93	78000

**Table 27 Correlations Between the Considered Variables**

	tertiary educated	early leavers	employment	GDP_PPS	R&D expenditure
tertiary educated					
early leavers	-0.21				
employment	0.34	-0.36			
GDP_PPS	0.41	-0.10	0.41		
R&D expenditure	0.42	-0.22	0.44	0.38	

**Table 28 Kolmogorov-Smirnov Test**

	tertiary educated	early leavers	employment	GDP_PPS	R&D expenditure
N	267	267	267	267	267
Mean	32.49	13.95	69.39	22622.47	1.56
Std. Deviation	10.97	7.42	7.07	8523.37	1.34
Z Kolmogorov-Smirnov	1.33	2.00	1.11	1.72	2.35
P-value (bilateral)	0.06	0.00	0.17	0.01	0.00

The five variables considered have problems of skewness that made it necessary to perform a normalization of the variables. In relation to missing values, it is worthy to mention that the datasets used did not show gaps in data specifications of the datasets and can be consulted in table 18 (section 5.2); the French regions FR91, FR92, FR93 and FR94 have been removed from the analysis as data for most of the indicators considered were not available for them. Regarding outliers, as the variables used are secondary datasets obtained from EUROSTAT, we assumed that no outliers derived from miscalculations may occur. Actually, a detailed observation of the data allowed identifying cases that can be considered outliers in the datasets values but that are not mistakes but really values of the datasets. This is the case, for example, of the variable GDP per capita in PPS in which the values of the regions, Inner London, Luxembourg and Brussels could be considered as outliers, as they are more than two standard deviations from the mean. Once we assumed that the five variables could be used in the clustering analysis we proceeded to the standardization of the variables to avoid the possibility that variables with high magnitude values would dominate the clustering results. The standardization method chosen was the calculation of Z-scores for each variable (see formula 1). The five variables of the analysis have skewness and kurtosis statistics that indicate a problematic normal distribution, these problems were also avoided by converting the values to Z-scores (Formula 1). The result of the calculation of Z-scores are standardised values with mean 0 and standard deviation 1.

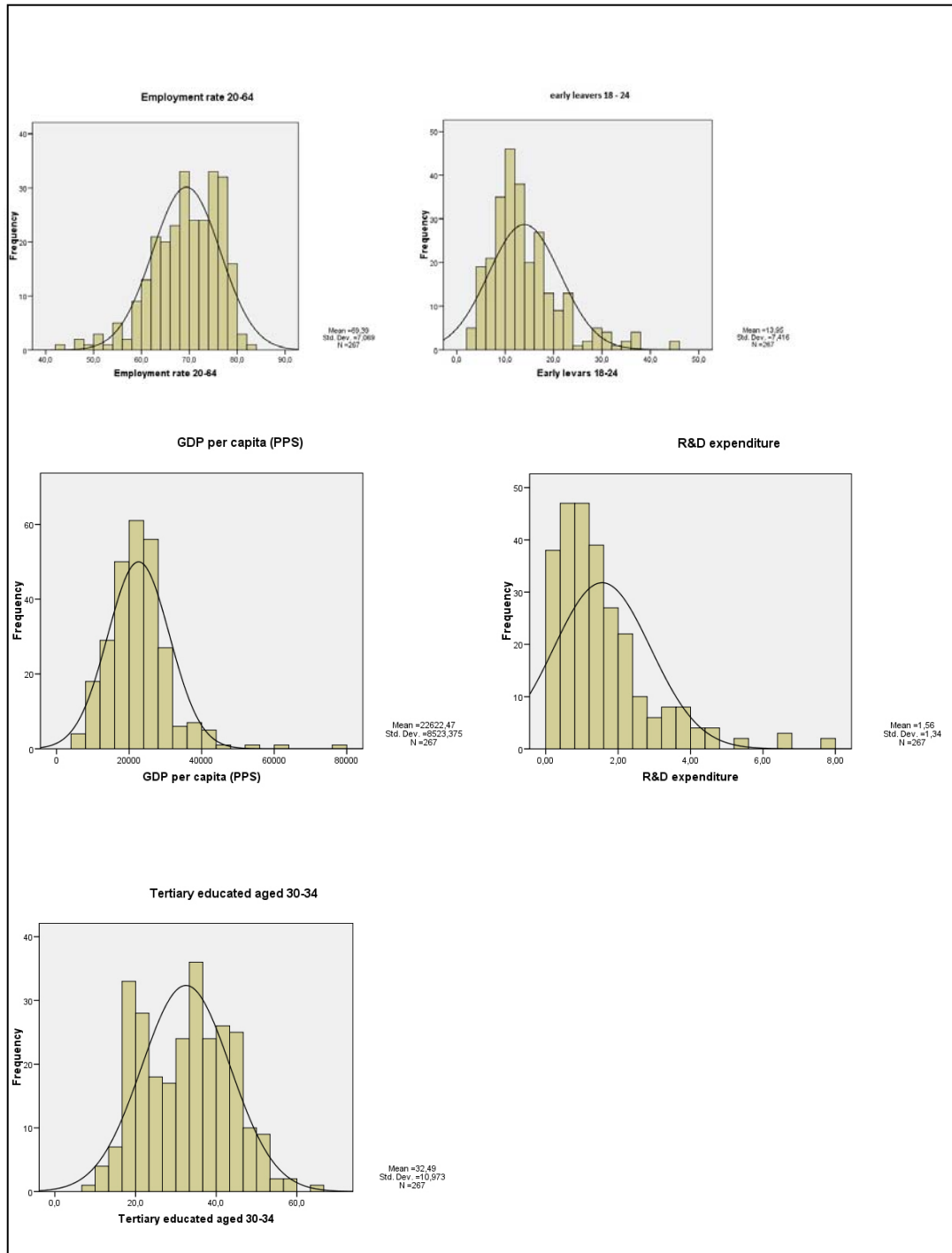
$$z = \frac{x - \mu}{\sigma}$$

Formula (1)

Once the variables were converted into z-scores we started the clustering process. K-mean cluster is an exploratory technique to group variables or cases. In the k-mean algorithm the researcher has to predefine the number of classes and then the algorithm allocates all areas to classes ensuring that the variation within a class is minimised. K-mean cluster is also appropriated for long datasets as it was used in them (as it consisted of 267 regions). In order to have a preliminary estimation of the appropriated number of clusters we have conducted a Hierarchical clustering that provided a clustering tree that would show the groups in terms of the statistical output, but unfortunately the huge amount of cases of clustering (267 regions) made the interpretation of the three complicated.

The clustering analysis has resulted in the elaboration of two clusters of regions that, in our opinion, are a good way to show EU groups of regions differing in their position in the social EU2020 indicator. Characteristics of both clusters are detailed below.

**Figure 6 Variable' Histograms**



### 6.2.1.1. First Clustering Analysis

The first cluster has been obtained by conducting a previous PCA analysis of the five variables considered. Principal component analysis (PCA) is a widely used statistical technique for unsupervised dimension reduction that was applied here as a previous step to the clustering analysis. Barlett's Test assumes that Null hypothesis  $H_0$ : The random sample comes from a universe in which all variables are completely uncorrelated. According to our results (table 29) the test statistic is moderately high (244.51), and accordingly the null hypothesis may be rejected (Sig.=0.000), so the variables are not completely uncorrelated. Kaiser-Meyer-Olkin Measure of Sampling Adequacy has become the standard test procedure for the factor analysis. The MSA criterion indicates the degree to which the variables are related, and it thus helps in evaluating if using a factor analysis makes sense. A general rule is that KMO should be 0.60 or higher in order to proceed with a factor analysis; the value obtained in the KMO test in our analysis has been 0.738, so we can proceed with the PCA.

Two Principal components were extracted showing Eigenvalues over 0.7 (see 31). The communalities (table 30) represent the proportion of the variance in the original variables that is accounted for by the factor solution. The factor solution should explain at least half of each original variable's variance, so the communality value for each variable should be 0.50 or higher as is shown in table 30.

**Table 29 KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.738
Bartlett's Test of Sphericity	Approx. Chi-Square	244.51
	df	10
	Sig.	.000

**Table 30 PCA Communalities**

	Initial	Extraction
Tertiary educated aged 30-34	1.000	.560
Early levars 18-24	1.000	.892
Employment rate 20-64	1.000	.621
GDP per capita (PPS)	1.000	.659
R&D expenditure	1.000	.569

**Table 31 Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.35	47.028	47.03	2.35	47.03	47.03	2.03	40.62	40.62
2	.95	18.97	66.00	.949	18.97	66.0	1.27	25.38	66.00
3	.64	12.741	78.74						
4	.60	11.931	90.67						
5	.47	9,329	100						

The information in 5 of the variables can be represented by 2 components (Table 32). The 2 components explain 66% of the total variance in the variables which are included on the components. The rotated solution allowed identifying the PC1 in which the variables loading were Tertiary educated aged 30-34, GDP per capita (PPS) and R&D expenditure and PC2, in which only the variable early leavers is loading. The variable employment is divided between the two PC, but showing a positive value in the case of PC1 and negative in the case of PC2. PC1 seems to measure "economy tertiarisation" while PC2 retains only the variable early leavers from education and training and can be called "low education". Therefore, regions particularly rich in terms of GDP and with a real investment in R&D tend to have higher values in PC1, while regions with a low investment in R&D, a low proportion of tertiary educated aged 30-34 and a low GDP show lower values in PC1. The variable employment has a negative value in PC2 which can be interpreted in the sense that employment and early school leavers are inversely related; this mean that regions showing a higher proportion of early school leavers tend to have lower employment rates. Be that as it may, the relative low loading of the variable employment in both PC1 and PC2 do not allow generalisations of this hypothesis.

**Table 32 Rotated Component Matrix**

	Component	
	1	2
Tertiary educated aged 30-34	.737	-.132
Early levars 18-24	-.036	.944
Employment rate 20-64	.569	-.546
GDP per capita (PPS)	.811	.037
R&D expenditure	.712	-.250

Having identified the main components, the 267 studied regions can be grouped according to their similarities in relation to the values of their components. This is precisely what allows the k-mean algorithm. Several trials have confirmed that the better solution to the regional divergence in the five variables under studied was 2 clusters obtained following the assumptions stated below:



- Number of clusters: two clusters
- For the algorithm convergence: 20 maximum iterations

The clusters centers are presented in table 33, while the number of cases (regions) that were assigned to each cluster is shown in table 33 which also provided descriptive statistics for the five variables used in the clustering analysis.

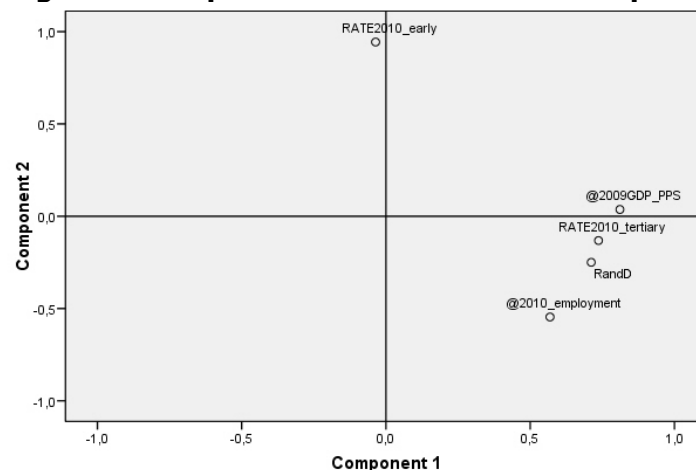
**Table 33 Final Cluster Centres**

	Cluster	
	2	1
REGR factor score 1 (PC1)	.17	-.51
REGR factor score 2 (PC2)	-.44	1.30

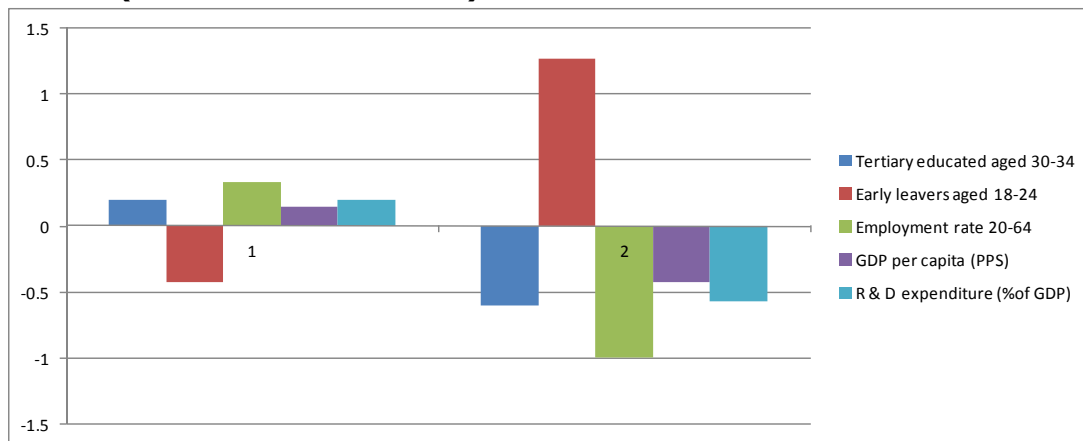
**Table 34 Descriptive Statistics for the Clusters of the First Clustering analysis**

	Cluster	N	Mean	Std. Deviation
Tertiary educated aged 30-34	2	200	34.71	10.25
	1	67	25.87	10.44
Early leavers aged 18-24	2	200	10.79	3.82
	1	67	23.39	7.54
Employment rate 20-64	2	200	71.75	5.22
	1	67	62.38	7.22
GDP per capita (PPS)	2	200	23826.50	8375.38
	1	67	19028.36	7986.42
R&D expenditure (% of GDP)	2	200	1.82	1.42
	1	67	.786	.56

**Figure 7 Component Plot in the Rotated Space**



**Figure 8 First Regional Clusters Analysis: Means of the Variables for Each Cluster (Standardized Z-scores)**

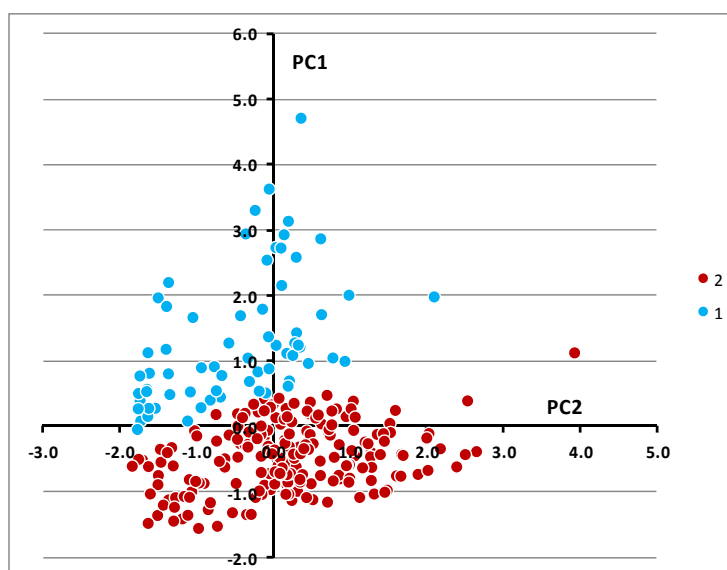


A t-test for equality of the means (table 35) have shown that the five variables are different between clusters with a significant level lower than 0.01 in many cases.

**Table 35 Independent Samples Test**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Tertiary educated aged 30-34	Equal variances assumed	.3	.58	6.082	265	.000	8.84	1.45	5.98	11.70
	Equal variances not assumed			6.028	111.69	.000	8.84	1.47	5.93	11.75
Early leavers 18-24	Equal variances assumed	42.05	.00	-17.83	265	.000	-12.61	.71	-14.00	-11.22
	Equal variances not assumed			-13.13	77.62	.000	-12.60	.96	-14.52	-10.69
Employment rate 20-64	Equal variances assumed	8.5	.00	11.50	265	.000	9.39	.82	7.78	10.99
	Equal variances not assumed			9.824	90.272	.000	9.39	.96	7.50	11.30
GDP per capita (PPS)	Equal variances assumed	.004	.95	4.10	265	.000	4798.14	1168.81	2496.80	7099.48
	Equal variances not assumed			4.20	118.27	.000	4798.14	1141.37	2537.98	7058.31
R&D expenditure	Equal variances assumed	25.25	.00	5.78	265	.000	1.03	.18	.68	1.40
	Equal variances not assumed			8.47	258.46	.000	1.03	.12	.79	1.27

**Figure 9 Representation and Interpretation of Principal Components Retained and Clusters Derived from Analysis of K-mean Clustering**



*Description of the Characteristics of Each Cluster*

Regions have been classified based on a previous Principal Component Analysis. Based on the cluster membership, the mean value for each indicator in each cluster (cluster centres), of the original data has been computed. However, the presence of GDP data whose scale differs very much from the other four indicators (expressed in %) compromises the possibilities of showing the means of the variables in each cluster together. On the one hand, this problem has been overcome by calculating the z-scores of the indicators and then the averages (figure 8). On the other hand, figure 9 shows the position of the regions and clusters in relation to the two principal components extracted. Under this calculation, Inner London is the region showing a better position in the PC1; this means that Inner London is the region with the highest level of tertiarisation, showing high values in the four variables: tertiary educated, GDP per capita, R&D investment and employment and a lower value in the variable early leavers from education and training. Along with Inner London, other urban regions are included in cluster 1 and show high values in PC1: Hovedstaden, Luxembourg, Stockholm or Stuttgart, among others.

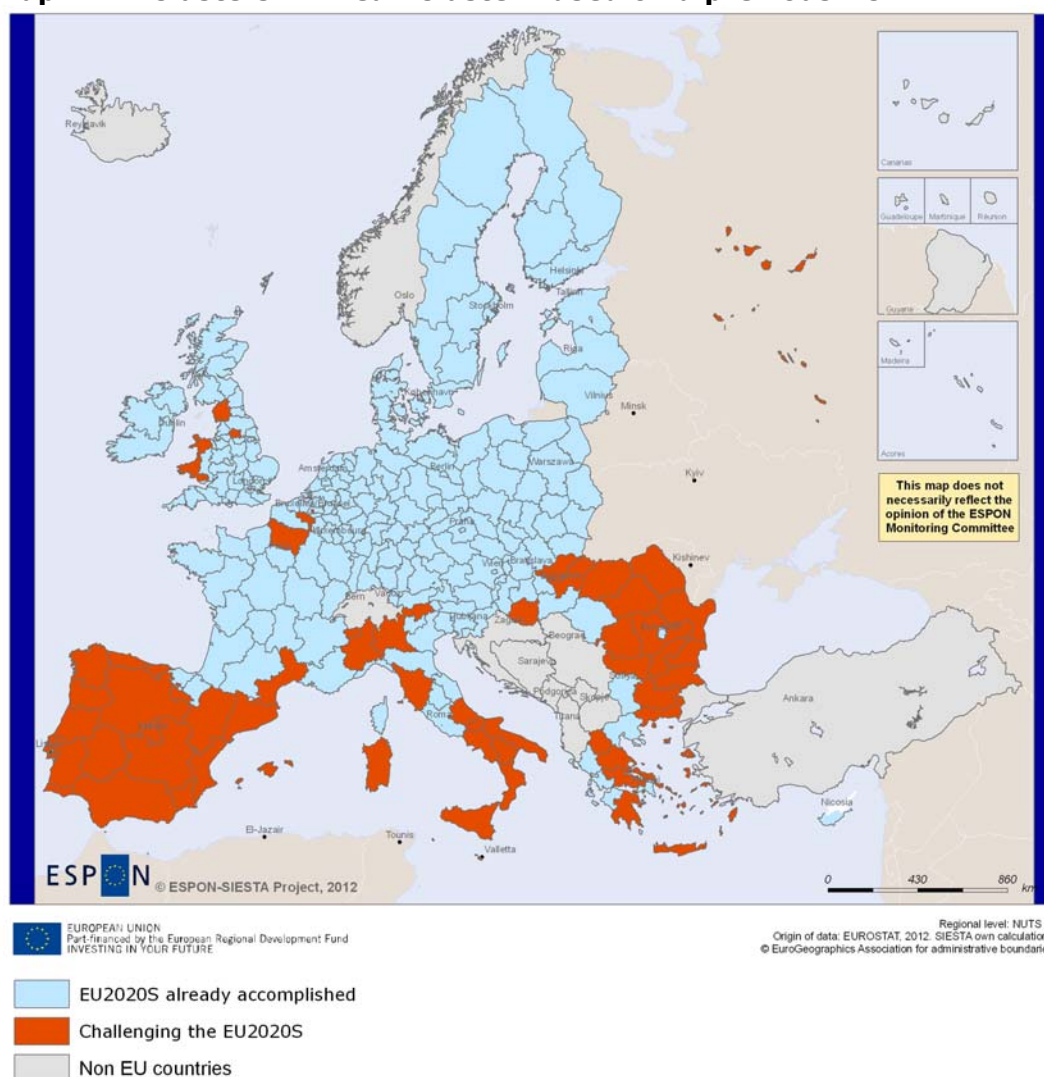
In brief, cluster 1 consists of 200 regions challenging the EU2020S (at least in the case of the non-environmental and energy targets). Conversely cluster 2 groups 67 regions scoring low values in four indicators: tertiary educated, GDP per capita, R&D investment and employment and high values in the variable early leavers from education and training. Therefore, this cluster groups those regions that are far from

reaching the headline targets on the indicators of the EU2020S in research, employment and education and that also have a lower GDP per capita in comparison with regions in cluster 1. This map is, in our opinion, an insightful overview of the present situation of the EU27 in relation to the EU2020S; it highlights the fact that the regions more affected by the economic and financial crisis are far from reaching the EU2020S targets in comparison with those less affected by the depression. So, if the EU2020S pretends to be a mechanism to overcome the depression in the right direction, in 2010 the regions that need to go ahead more are those showing more lacks in relation to the EU2020S headline targets. It is worthy to mention also that this clustering analysis shows the typical division of Europe between the South (poorest) and the North (richest) regions; these blocks are the truly EU2020S macroregions.

Map 17 reflects a basic divide in the EU between two blocks. Elaborated through PCA, it suggests that with regard to the EU2020S development the basic distinction in the EU has to be made mainly between the North and the South. Throughout the Atlas, usually a division has been made between Eastern and Western Europe, but when the four available headlines according to the EU2020S are mixed together, then the basic divide is between the North and the South. The former is in general already accomplishing the EU2020S, while the latter is challenging this strategic document of the EU. This is substantial, because it proposes that the EU2020S does not have to consider the distinction between the member states pre-2004, on the one hand, and post-2004, on the other. It rather implies that regional scale matters and the attention must be paid to the Southern and Mediterranean Europe, plus the South-East, as a 'problematic' macro-region that needs to be addressed in order for the EU2020S to be achieved across Europe. Obviously, if the sustainable growth items were included, the picture might be different (poverty probably would not modify this analysis too much), but it has to be reiterated that there are no available datasets at regional scale for these issues. As suggested in Figure 8 and Map 17, Southern regions have low shares of higher educated population and very high rates of early school leavers, display very low levels of employment, expend poorly their GDP for R&D and account for a low GDP per capita. In contrast, Northern regions score comparatively better in all these items. Importantly, the regional scale is essential because in several countries there are important variations, for instance in Italy or in Hungary. In France, Picardie and Languedoc-Roussillon are in the Southern cluster, but the rest of the country is in the Northern. In Spain the situation is the opposite: the Basque Country and Navarra are in the Northern cluster, but the rest of the country is in the Southern. In Bulgaria, Romania or Greece, the respective capital regions escape exceptionally from the Southern pattern,

but the contrast between South and North does not seem to generally correlate in any case with the urban-rural reality of the EU.

**Map 17 2 Clusters. K-mean Cluster Based on a previous PCA**



### 6.2.1.2. Second Clustering Analysis

The same k-mean cluster algorithm was applied as in the first clustering analysis, using the same clustering options (Number of clusters: two clusters; for the algorithm convergence: 20 maximum iterations) but instead of using the derived ACP scores we have used the five original variables converted in Z-scores. We have done several trials with different numbers of clusters (from two to 6) and we have selected a solution of 4 clusters as the best to show the regional dimension of the EU2020S (not including the environmental and energy headline indicators). Over 4 clusters the solutions of the k-means algorithm have not differed very much; solutions with 5 or 6 clusters just differed in the presence of clusters grouping very few regions, and these clusters including few regions did not add important information to the analysis. The cluster

centers of the Z-scores variables are presented in table 36. Table 37 shows the distances between the final 4 cluster centres along with the number of cases (regions) that were assigned to each cluster.

**Table 36 Final Cluster Centers**

	Cluster			
	1	2	3	4
Tertiary educated aged 30-34	-.64681	-.21435	.85141	1.92377
Early leavers 18-24	1.40718	-.37962	-.33439	-.40675
Employment rate 20-64	-1.16694	.09836	.74153	-.46578
GDP per capita (PPS)	-.65048	-.19247	.68354	4.89370
R&D expenditure	-.62785	-.37265	1.23579	-.05853

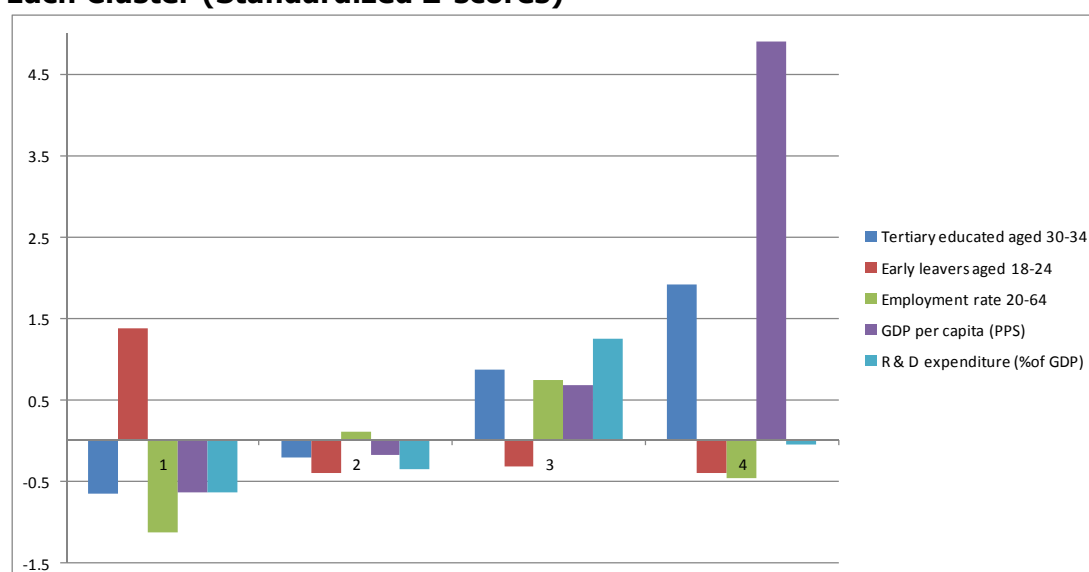
**Table 37 Distances between Final Cluster Centres**

Cluster	Number of cases	1	1	2	3	4
1	3	6.49		5.5	4.7	
2	139	2.29	5.5		2.2	5.5
3	70	3.76	4.69	2.2		4.69
4	55		6.44	2.30	3.80	6.44

**Table 38 Descriptive statistics**

		N	Mean	Std. Deviation	Minimum	Maximum
Tertiary educated aged 30-34	1	55	25.4	10.09	11.3	48
	2	139	30.1	8.86	8.4	51.5
	3	70	41.8	8.05	20.2	59.9
	4	3	53.6	10.82	46.1	66
	Total	267	32.5	10.97	8.4	66
Early leavers 18-24	1	55	24.4	7.87	12.4	45.2
	2	139	11.1	4.31	2.3	22.5
	3	70	11.5	3.97	2.8	22.5
	4	3	10.9	6.47	7.1	18.4
	Total	267	14.0	7.42	2.3	45.2
Employment rate of the population aged 20-64	1	55	61.1	7.14	43.7	76.7
	2	139	70.1	5.24	59.2	83.6
	3	70	74.6	3.62	65.7	81.7
	4	3	66.1	6.09	59.2	70.7
	Total	267	69.4	7.07	43.7	83.6
GDP per capita (PPS)	1	55	17078.2	6295.02	6400	31600
	2	139	20982.0	5482.40	9600	34700
	3	70	28448.6	6644.53	15300	44100
	4	3	64333.3	12848.48	52500	78000
	Total	267	22622.5	8523.38	6400	78000
R&D expenditure (% of GDP)	1	55	0.7	0.49	0.12	2.76
	2	139	1.1	0.58	0.1	2.54
	3	70	3.2	1.48	0.89	7.93
	4	3	1.5	0.22	1.24	1.66
	Total	267	1.6	1.34	0.1	7.93

**Figure 10 Second Regional Clusters Analysis: Means of the Variables for Each Cluster (Standardized Z-scores)**



### *Description of the Characteristics of Each Cluster*

The early rough EU2020S division of Europe showed by map 17 is refined with this second cluster analysis. The pattern shown in map 18 (derived from second cluster analysis) is mostly the same as the previous map 17 and coincides with the same items expressed before: bad scoring in education, unemployment, GERD and GDP per capita, that is, seriously experiencing the current crisis and with several problems that tend to be accumulated and that move these territories far away from the EU2020S, thus challenging its implementation. In relation to the previous cluster analysis, most of the specific regions that 'escape' from this first cluster are capitals (Lisbon, Madrid, Rome) and Northern Italy; these regions are comparatively better, but in a first approach they were amalgamated within. In any case, this cluster masks the fact that there are regions scoring quite well in some specific items, for instance most of the Northern Spanish regions in tertiary educated population.

The second cluster consists of regions that do not tend to perform in most of the headline targets, except employment. That means that they are quite weak in tertiary education, early school drop-out, GDP per capita and/or GERD investment, being close to average levels, but in employment they score slightly better than the average. This second cluster is a kind of transition between the performing regions and the regions experiencing severe problems. They are a kind of intermediate situation in terms of the EU2020S implementation and they might advance if proper policies are put in place. The Eastern Baltic States and

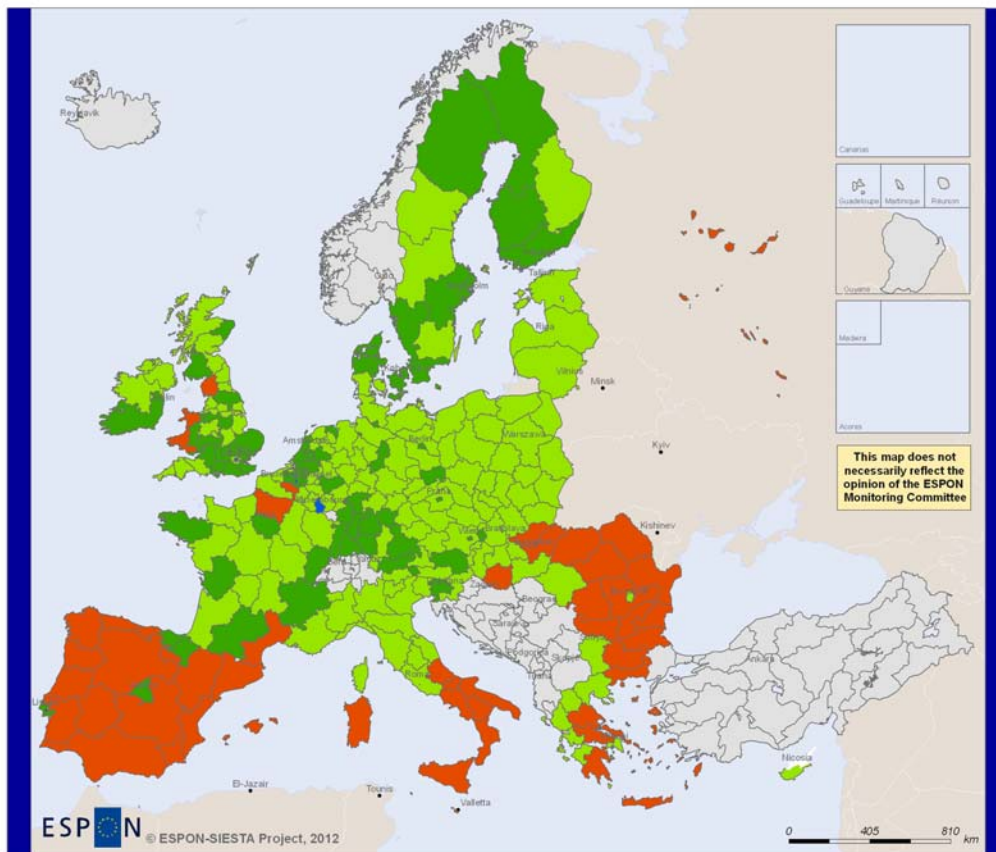
all Polish regions or all the regions of the Czech Republic and Slovakia (except their respective capitals) are clustered herein, at the same level as most of the typically Western regions or rural regions in Scandinavia or the British Isles; this is substantial as it shows that, according to the EU2020S, they are in quite a comparable situation.

The third cluster consists of the performing regions scoring well in the headline targets set by the EU2020S. Arguably, these regions are the most dynamic and competitive in the EU economy and ready to compete globally. Unsurprisingly, the outstanding capital regions (London, Île-de-France, Madrid, Berlin, Wien, Prague, etc.) are comprised therein. Again, the three corridors that previous researchers have suggested for high levels of R&D are appreciated on Map 5.5: Midi-Pyrénées to Bavaria, Austria to London and Copenhagen to Helsinki; even the well-known metaphor of the "blue banana" is easily seen, embracing most of the regions of the Benelux. The fact that these regions tend to score well cannot mask the fact that there are internal variations, with some regions having specific problematic issues according to the EU2020S.

The fourth cluster is defined specifically depending on high levels of GDP per capita: Inner London, Brussels and Luxembourg. These might be considered the best performing territories of Europe in terms of economic growth, but Graphic 5.2 suggests that they follow the EU2020S in an uneven manner. Indeed, and except for the data on GDP per capita and tertiary educated population, they are more similar to the second cluster than to the third.



**Map 18 4 Clusters. K-mean Clustering Based in Z-scores**




 EUROPEAN UNION  
 Part-financed by the European Regional Development Fund  
 INVESTING IN YOUR FUTURE

Regional level: NUTS 2  
 Origin of data: EUROSTAT, 2012. SIESTA own calculations  
 © EuroGeographics Association for administrative boundaries

**Clusters**

-  Challenging the EU2020S
-  EU2020S on the move
-  EU2020S performance
-  GDP leaders
-  No data

### **6.3. Principal Component Analysis Applied to the Indicators Developed in the Project**

Principal Component Analysis (PCA) is a statistical technique of synthesis of information, or reducing the size (number of variables). That is, given a database with many variables, the objective will be reduced to fewer by losing as little information as possible. The new principal components or factors are a linear combination of the original variables, and will also be independent. A key aspect is the interpretation of PCA factors, since it is not given a priori, but will be deducted after observing the relationship of the factors with the initial variables (therefore, to study both the sign and magnitude of correlations will be studied). In the context of SIESTA project, this analysis has been designed in order to look for relationships between the indicators selected in the project to show the regional dimension of the EU2020S but also to identify factors that resulted from the combinations of the indicators under study. Unfortunately not all the indicators included in the final list of indicators considered (see section 4.1.3.1) can be integrated into the PCA, we have chosen only those variables available at regional NUTS 2 level; this criteria have excluded from the analysis all the indicators representing the environmental and energy EU2020S headline target. It is worthy to mention again the problems of data reliability affecting to the indicators, (i) % of people aged 30-34 tertiary educated, (ii) early leavers aged 18-24 from education and training and (iii) people not in work, education and training (neet). Section 4.2.3 and table 13 gives more information about data quality of these indicators above mentioned. This section is devoted to explain the results obtained through a principal component analysis (PCA herein) applied to 25 variables. 20 of these variables are indicators considered to analyze the territorial dimension of the EU2020S in the project and to illustrate the final atlas (see section 4.1.3.1). The five extra indicators are the percentage of employment in the following NACE Rev. 2 sectors:

- SECTOR A: Agriculture, forestry and fishing
- SECTOR B - E: Industry (except construction)
- SECTOR F: Construction
- SECTOR J: Information and communication
- SECTOR K Financial and insurance activities

Data for five indicators have been downloaded from EUROSTAT webpage. These indicators have been selected because they apparently link with

economic growth as defined by the EU2020S. The overall 27 datasets are for year 2010 with the following exceptions:

- R&D expenditure (% of GDP) which is for 2009.
- Employment in technology and knowledge-intensive sectors which is for 2009.
- Number of patents per 1000 inhabitants, this is for 2009.
- People commuting, this is for 2009.
- Life expectancy at birth. Data for this indicator are for 2010 with the exception of France, Cyprus and United Kingdom that are for 2009 and Italy that are for 2008.

The countries included in the analysis were the EU27; French regions FR91, FR92, FR93 and FR94 have been removed from the analysis as data for most of the indicators considered were not available for them. Table 39 presents a description of the 25 indicators considered in the analysis and the link with the EU2020S main topics.

**Table 39 Indicators included in the PCA**

<b>Employment</b>
1. Employment rate of the age group 20-64, 2010.
2. Percentage of employment in agriculture, forestry and fishing, 2010.
3. Percentage of employment in industry, 2010.
4. Percentage of employment in construction, 2010.
5. Percentage of employment in information and communication, 2010.
6. Percentage of employment in financial and insurance activities, 2010.
7. Percentage of employment in public administration, defence, education, human health and social work activities, 2010.
8. Percentage of employment in technology and knowledge-intensive sectors (% of total employment), 2010.
<b>Innovation</b>
9. R&D expenditure in percentage of GDP, 2010.
10. Human resources in science and technology (HRST), 2010.
11. Broadband penetration rate, 2006-2009.
12. Per capita total patent applications, 2008.
<b>Education</b>
13. Early leavers from education and training. People aged 18 to 24, 2010.
14. Tertiary educated total, 2010.
15. Tertiary educational aged group 30-34, 2010
16. Share of young people NEET, 2010.
<b>Skills and Jobs</b>
17. Life-long learning participants, 2010.
18. young people aged 15-24 neither in employment nor in education and training (NEET), 2010
19. Youth unemployment aged 15-24, 2010.
20. Long term unemployment (more than 12 months), 2010.
<b>Poverty and Exclusion</b>
21. Ageing index, 2010.
<b>Others</b>
22. Average number of usual weekly hours of work in main job, 2010.
23. Life expectancy at birth, 2010.
24. People commuting, 2009.
25. GDP per capita in PPS, 2009.

The first 8 indicators were selected to reflect the labor market characteristics of a region, although indicator 8 (% of employment in technology and knowledge intensive sectors) could be also included in the group of the innovation indicators. Indicators 13 to 18 are devoted to representing the education issue while indicators 19 to 21, including unemployment, are considered to be related to poverty and social exclusion. Finally indicators 22 to 24 were considered in the analysis to see if they are related to the indicators in the EU2020S pillars but also, in the case of life expectancy at birth, it was an attempt to complete unemployment by an indirect measure of global social well being of the population. GDP per capita is the last indicator on the list. Strictly speaking, GDP per capita is not a headline target of the EU2020S. However, it has been considered in the clustering analysis because the EU2020S deals basically with promoting growth and, as has been argued in this Project; growth is commonly measured through GDP per capita.

### **6.3.1. Results of the PCA**

For the PCA, we used the commercial software SPSS v.17. Before proceeding with the PCA we studied the correlations between the variables considered for analysis as PCA requires that there be some correlations greater than 0.30 between the variables included in the analysis; more than 20 correlations were greater than 0.60.

Before running the PCA using the software SPSS v.17, the z-scores for each variable were calculated (see section 6.2.1 for more information about z-scores). Using the standardized variables, a first PCA showed that some variables do not contribute very much to explaining the total variance of the data so, for the second and definitive PCA the following variables were discarded:

- People commuting
- Life expectancy at birth
- Ageing index
- Patent applications per 1000 inhabitants

Table 40 shows the main descriptive statistics of the variables included in the PCA.

The values obtained both in Barlett's test and in Kaiser-Meyer-Olkin Measure of Sampling Adequacy have confirmed the correctness of this second PCA (see table 41). The MSA criterion indicates the degree to which the variables are related, and it thus helps in evaluating if using a factor analysis makes sense. A general rule is that KMO should be 0.60 or

higher in order to proceed with a factor analysis; the value obtained in the KMO test in our analysis has been 0.806, so we can proceed with the PCA. Principal component analysis requires that the probability associated with Bartlett's Test of Sphericity be less than the level of significance and this is the case of our analysis (Sig. < 0.001).

**Table 40. Descriptive statistics of the variables used in the PCA**

		N	Minimum	Maximum	Mean	Std. Deviation
1	Employment rate 20-64	267	43.7	83.6	69.40	7.0688
2	% of employ. in agriculture, forestry and fishing	242	.24	49.08	6.06	7.24
3	% of employ. industry	263	3.04	34.68	17.54	6.88
4	% of employ. in construction	264	4.08	14.44	7.95	1.81
5	% of employ. in information and communication	235	.65	8.19	2.59	1.48
6	% of employ. in financial and insurance activities	247	.72	12.36	2.78	1.42
7	% of employ. in public administration, defence, education, human health and social work activities	267	10.41	47.37	25.75	5.89
8	Employment in technology and knowledge-intensive sectors (% of total employment)	267	14.74	66.04	38.12	8.68
9	R&D expenditure	251	.10	7.93	1.6247	1.35
10	Human resources in science and technology (HRST)	267	16.2	66.9	37.149	8.83
11	Broadband penetration rate 2006-2009	266	9	84	46.26	16.32
12	Patents per 1000 inhabitants (2008)	267	0.00	11.04	.5482	1.29
13	Early leavers 18-24	267	2.3	45.2	13.950	7.42
14	Tertiary educated total	267	9	53	25.49	8.58
15	Tertiary educated 30-34	267	8.4	66.0	32.50	10.97
16	young people aged 15-24 neither in employment nor in education and training (NEET)	267	0	31	10.87	6.84
17	life-long learning participants	257	.8	36.1	10.205	7.05
18	Low educated people	267	3.3	78.4	26.964	14.91
19	youth unemployment 15-24	267	4	60	21.46	10.33
20	Long term unemployment (more than 12 months)	267	.19	12.72	3.6412	2.39
21	Ageing index	267	.45	2.41	1.1793	.34
22	Average number of usual weekly hours of work in main job	267	29.2	45.3	37.649	2.72
23	Life expectancy at birth	265	72.7	84.0	79.819	2.54
24	People commuting (2009)	267	0.00	.47	.0786	.081
25	GDP per capita (PPS) (2009)	267	6400.00	78000.00	22725.09	8472.68

**Table 41 KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.806
Bartlett's Test of Sphericity	Approx. Chi-Square	3887.172
	df	171
	Sig.	.000

A non-rotated extraction solution allowed us to extract four Principal components showing Eigen values over 1 (see table 42). The three first components keep 67.2 % of the variance (respectively 43.2, 16.41 and 7.58, with Eigen values higher than 1 for all three components), while the following components account for much less of the variance and Eigen values under 1.

**Table 42 total variance explained**

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	8.209	43.204	43.204
2	3.120	16.419	59.624
3	1.441	7.586	67.210
4	1.270	6.682	73.892

According to table 43 and graph 11, PC1 includes the following variables:

- showing high positive loadings were: employment rate, % of employment in information and communication, % of employment in technology and knowledge-intensive sectors, Human resources in science and technology, Broadband penetration rate 2006-2009, tertiary educated, Life-long learning participants.
- R&D expenditure (% of GDP) that showed a moderate positive load
- showing high negative loadings % of employment in agriculture, forestry and fishing, the % percentage of employment in construction, People not in work, education or training (NEET), the Youth unemployment rate and the long term unemployment.

**Table 43 PCA Components**

	Component			
	1	2	3	4
Employment 20-64	.783	-.391	-.110	-.207
% of employ. in agriculture, forestry and fishing	-.571	-.229	-.140	-.286
% of employ. in industry	-.393	-.692	.077	.152
% of employ. in construction	-.631	.121	.019	.214
% of employ. Information and communication	.727	.151	.418	.111
% of employ. in financial and insurance activities	.579	.133	.639	-.032
% of employ. in public administration, defence, education, human health and social work activities	.587	.395	-.524	.178
% of employ. in technology and knowledge-intensive sectors	.831	.431	-.117	.118
R and D expenditure (% of GDP)	.588	-.022	.010	.066
Human resources in science and technology	.891	.139	.179	.226
Broadband penetration rate 2006-2009	.825	.149	-.369	-.020
Early leavers 18-24	-.395	.655	.066	-.474
Tertiary educated Total	.760	.331	-.022	.218
People not in work, education or training (NEET)	-.644	.568	.089	.092
Life-long learning participants	.631	.220	-.404	-.225
Low educated people	-.365	.667	.059	-.526
Youth unemployment 15-24	-.608	.635	-.025	.283
Long term unemployment (more than 12 months)	-.605	.465	.070	.463
GDP per capita (in PPS)	.764	.149	.422	-.243

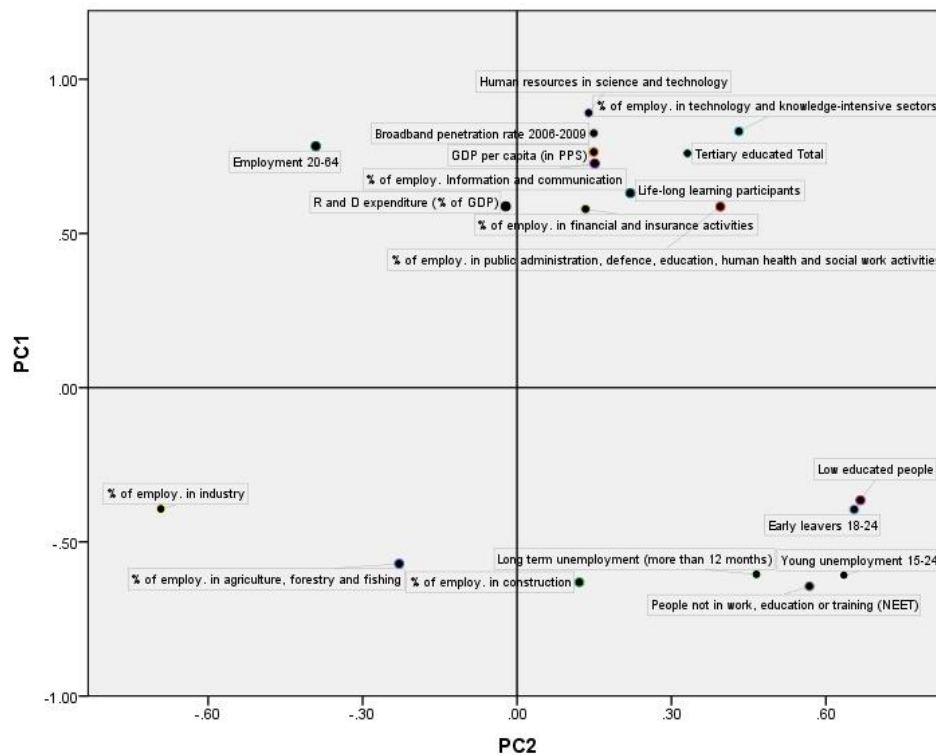
PC2 includes the following variables:

- % of employment in industry, with a high negative load.
- early leavers, needs, low educated people and youth unemployment rate have high positive loadings.

Finally, PC3 has a high positive loading in the variable % of employment in financial and a moderate positive loading in GDP per capita. We interpreted the first three components in the following way:

- PC1 represents economic and technological development based on highly educated human resources (smart economy) in opposition to economies based on sectors such as construction or agriculture.
- PC2 represents the social effects derived from the importance of manufacturing in regional employment. It seems that those regions where the employment in industry is high the proportion of youth unemployment, needs, early leavers and low educated people decreases.
- Finally PC3 seems to show the richness of the regions that have a high percentage of employment in NACE Rev. 2 sector K: Financial and insurance activities. This factor can be designated as "financial performance".

**Figure 11 Principal Components Loadings (only PC1 and PC2 Are Shown)**



Having identified the main components, the regions studied were to be grouped according to their similarities in relation to the values of its component. This is precisely what allows the k-mean algorithm. Several trials have confirmed that the better solution to show the regional divergence in the three Principal Component were 5 clusters (see table 44) obtained following the assumptions stated below:

- Number of clusters: five clusters
- For the algorithm convergence: 20 maximum iterations

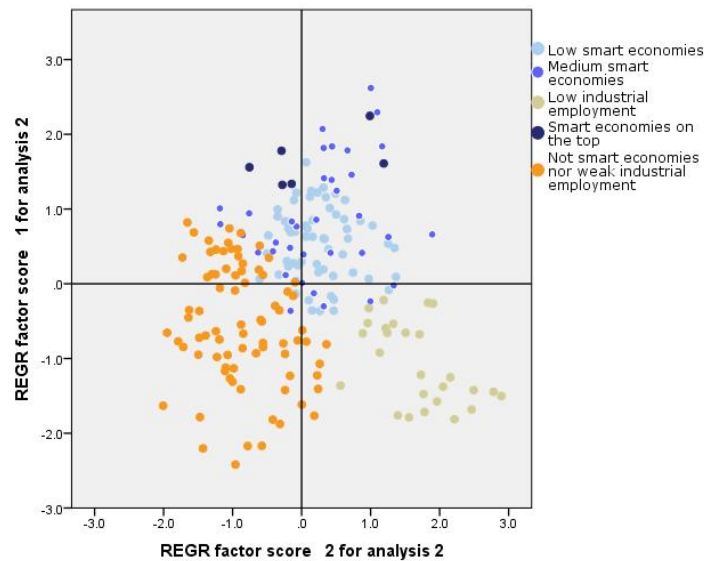
Table 44 show the final cluster centres are computed as the mean for each variable within each final cluster. The final cluster centres reflect the characteristics of the typical case for each cluster.

**Table 44 Final Cluster Centres**

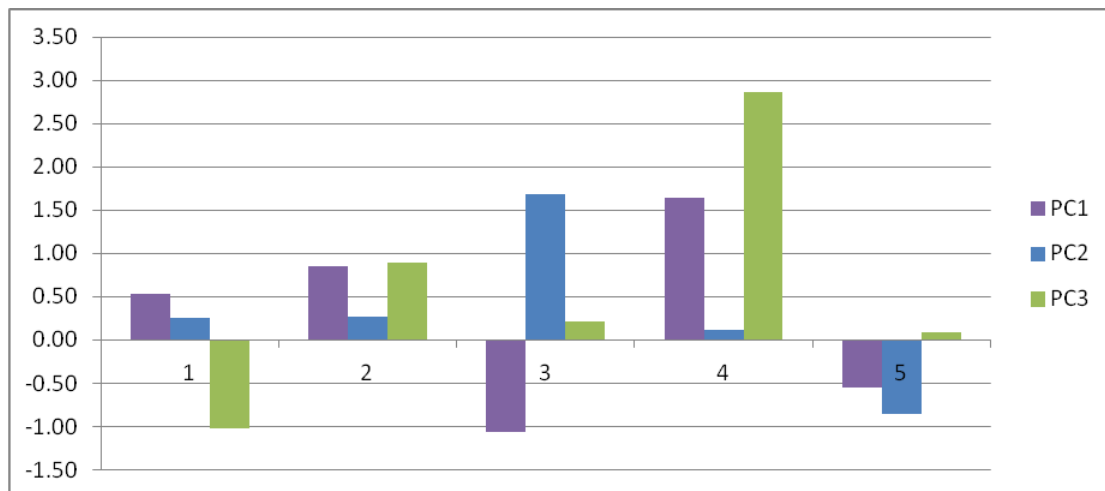
	Cluster				
	1	2	3	4	5
REGR factor score 1 for analysis 2	.54	.86	-1.06	1.6	-.55
REGR factor score 2 for analysis 2	.25	.26	1.70	.12	-.85
REGR factor score 3 for analysis 2	-1.02	.90	.22	2.86	.088



**Figure 12 Representation and interpretation of principal components retained and clusters derived from analysis of k-mean cluster**



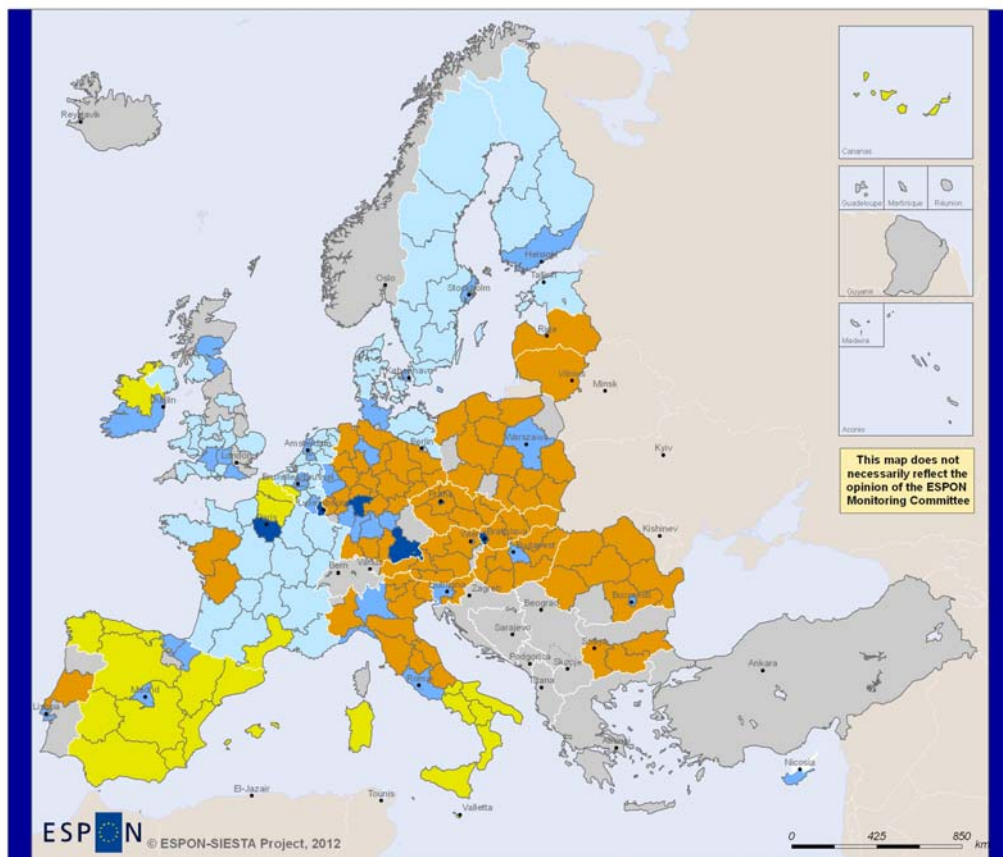
**Figure 13 clustering analysis based on previous PCA: means of the variables for each cluster (standardized z-values)**



Map 19 shows the result of this final clustering analysis. Cluster 1 consists of 60 regions characterized by low smart economies and in which GDP is not directly related to financial activities. Cluster 2 groups 35 regions that can be characterized as medium smart economies and compared to cluster 1, regions in cluster 2 are better positioned and have a higher share of employment in activities related to finance; this is the case of Lazio, and Lombardi in Italy, Bucharest in Romania, Madrid, Navarra and the Basque country in Spain, or Berkshire, Buckinghamshire and Oxfordshire in United Kingdom. Cluster 3 consists of 26 regions with neither a smart economy nor a high share of employment in the industry sector. For regions on cluster 3, for example, most of Spain, the south of

Italy or Northern Ireland, the relatively low industrial development seems to be related to a high proportion of early school leavers and a high youth unemployment rate. Cluster 4 represents 6 regions that are the better positioned and in which economy is based on innovation and research but also with a relevant proportion of employment in financial activities; this is the case of Luxembourg, Île-de-France or Oberbayern in Germany. Finally, cluster 5 consists of 80 regions where employment in industry sector is significant but conversely they are far from reaching a smart economy. This is the case of Eastern Europe, the most of German regions the north and centre of Italy, Latvia and Lithuania.

**Map 19 5 Clusters derived from previous ACP**



EUROPEAN UNION  
Part-financed by the European Regional Development Fund  
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Regional level: NUTS 2  
Origin of data: EUROSTAT, 2012; SIESTA own calculations  
© EuroGeographics Association for administrative boundaries

- Smart economies on the top
- Medium smart economies
- Low smart economies
- Low industrial employment
- Not smart economies nor weak industrial employment
- No data

## 7. Considerations about Maps

As the main objective of this project has been to develop an Atlas of the EU2020S, maps have been one of the key issues. In an early stage of the project, and just after the elaboration of the final list of indicators to be included in the Atlas (section 4.1.3) a first version of the maps has been produced. This rough version of the maps was done in order to support the research done by the project partners on the different sections of the Atlas (see section 8 for more details) that resulted in the elaboration of 6 research papers later used to write the final Atlas.

This section is devoted to explaining the cartographic criteria established in the project partner MCRIT in order to produce the final maps included in the Atlas.

### 7.1. Criteria Adopted to Design the Maps

According Edward Tufte, in one of most influential studies on the subject<sup>93</sup>, excellence in statistical graphics, and mapping, consists of complex ideas communicated with clarity, precision and efficiency. Graphical and cartographic displays must induce the viewer and reader to think about the substance (a given scientific result or political message) rather than about something else, encourage the eye to compare different pieces of data, reveal the data at different levels of detail, from a broad overview to a fine structure, serve a reasonably clear purpose and be closely integrated with statistical and verbal descriptions of the dataset. After all, graphics and maps *reveal data*. These have been the ideas that have driven the criteria to build the maps included in the Atlas.

This *Espon Siesta* project has designed 3 basic types of maps:

- Maps by themes
- Maps according to Europe 2020 Targets
- Urban Areas Maps

Maps by themes show the static data of each indicator. The data represented were ranked generally in 4 classes and presented as choropleth, where areas of NUTS0, NUTS1, NUTS2 or NUTS3 are patterned in proportion to the measurement of the statistical variable being displayed on the map. On these maps, data are presented in

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93 Tufte, Edward (2001, 2nd edition): *The Visual Display of Quantitative Information*. Cheshire: Graphics Press.

graduated colours where colours are ordered progressively from low to high. Light colours are used to show low data values and dark colours are used to show high data values.

In Maps according to Target, the maps show the Europe 2020 Targets. For each target three maps are designed: present state in relation to Europe 2020 Target, Distance from National Target and Change of value during the last years. In these maps, data are represented in two variations of colours, a colour to represent negative values and the other to represent positive values.

In Urban Areas Maps, values are represented in graduated symbols where the size of the symbol is linked to data value of each large urban area. The colour of the symbol is linked to the value of each urban area.

The formats of maps (colours and ramps or data classification) are summarized below.

### 7.1.1. Maps by Theme

<i>Indicators represented</i>	<b>Colours ramp</b>	<b>Data classification method</b>
<b>Smart Growth</b>		
Innovation	Violet	Equal Interval in 4 classes
Education	Orange - Brown	Equal Interval in 4 classes
Digital Society	Purple	Equal Interval in 4 classes
<b>Sustainable Growth</b>		
Competitiveness and Economic Growth	Blue	Equal Interval in 4 classes
Green Economy, Climate Change and Energy	Yellow - Orange	Equal Interval in 4 classes
<b>Inclusive Growth</b>		
Employment, Skills and Jobs	Blue	Equal Interval in 4 classes
Poverty and Exclusion	Pink	Equal Interval in 4 classes

### 7.1.2. Maps According to Target

*Indicators represented:*

<i>Indicators represented</i>	<b>Colours ramp</b>	<b>Data classification method</b>
Employment rate in %	Depending on the index used	Equal Interval in 6 classes
R&D in % of GDP		
CO2 emissions targets in %		
Renewable energy in %		
Energy efficiency – reduction of energy consumption in Mtoe		
Early school leaving in %		
Tertiary education in %		
Reduction of population at risk of poverty or social exclusion in number of persons		

*Additional criteria:*

- *Criteria for the “Present State in relation to EU 2020 Target” Maps:* Ramp of colours: from red (negative values) to blue (positive values).
- *Criteria for the “Distance to National Target” Maps* Ramp of colours: from red (negative values) to green (positive values)
- *Criteria for the “Change over time” Maps:* Ramp colours: from brown (negative changes) to green (positive changes)

### **7.1.3. Maps by Large Urban Areas**

*Indicators represented:*

<i>Indicators represented</i>	<b>Colours ramp</b>	<b>Data classification method</b>
Research specialisation in NBIC technologies in specialization index	Violet	Equal Interval in 4 classes
Students not completing their compulsory education in %	Orange - Brown	Equal Interval in 4 classes
Population having their tertiary education in %	Orange - Brown	Equal Interval in 4 classes
GDP per inhabitant	Blue	Equal Interval in 4 classes
Headquarters of Transnational firms	Blue	Equal Interval in 4 classes
Share of journeys to work by car in %	Yellow – Orange	Equal Interval in 4 classes
Unemployment rate in %	Blue to red	Equal Interval in 6 classes
Gender balance in unemployment rate in %	Purple to Blue	Equal Interval in 4 classes
Residents unemployed aged 15-24 in %	Blue	Equal Interval in 4 classes
Working age population qualified	Blue	Equal Interval in 4 classes
Median disposable annual household income in €	Pink	Equal Interval in 4 classes
Households with less than 60% of the national median annual disposable income in %	Pink	Equal Interval in 4 classes
Long-term unemployment in %	Pink	Equal Interval in 4 classes
Ageing index	Pink	Equal Interval in 4 classes

*Additional criteria:*

Symbols used: Circle

Size of symbols: 5, 10, 18, 32

### 7.1.4. Exceptions to the General Rules

*Criteria for Gender Balance Maps (55, 59):*

Ramp of colours: from pink to blue

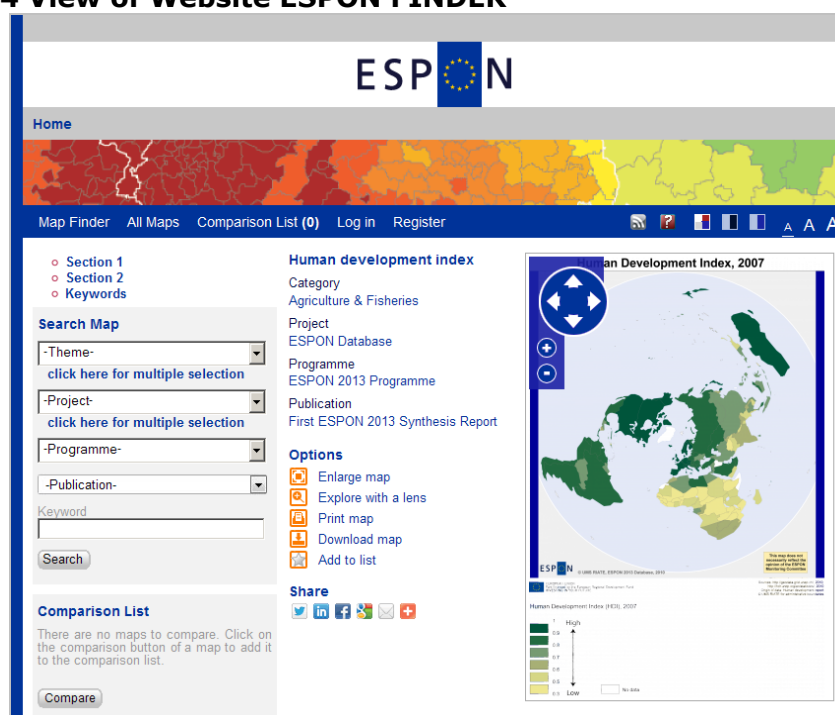
Data classification: 6 classes

## 7.2. The Digital Version of the Atlas

One of the key objectives of this project was to facilitate a digital version EU2020S Atlas. This version should allow easy access and interactive content generated during the project, ie. maps, texts and policy recommendations. This digital version of the atlas will be made with the new ESPON tool called Mapfinder, intended to be a digital repository of maps generated by the ESPON projects. Our team has found this tool to be a great alternative to the generation of new software applications since it is likely that this new tool will have a wide dissemination and its upgrading and maintenance is secured by the ESPON platform.

Map finder (<http://mapfinder.espon.eu/>) stores the maps delivered by the ESPON Coordination Unit including a corresponding explanation and reference information (ESPON Project name, Programme number and Project number). With this tool designed by ESPON it will be able to search, download and print all these maps. This tool designed by ESPON is still in progress.

**Figure 14 View of Website ESPON FINDER**



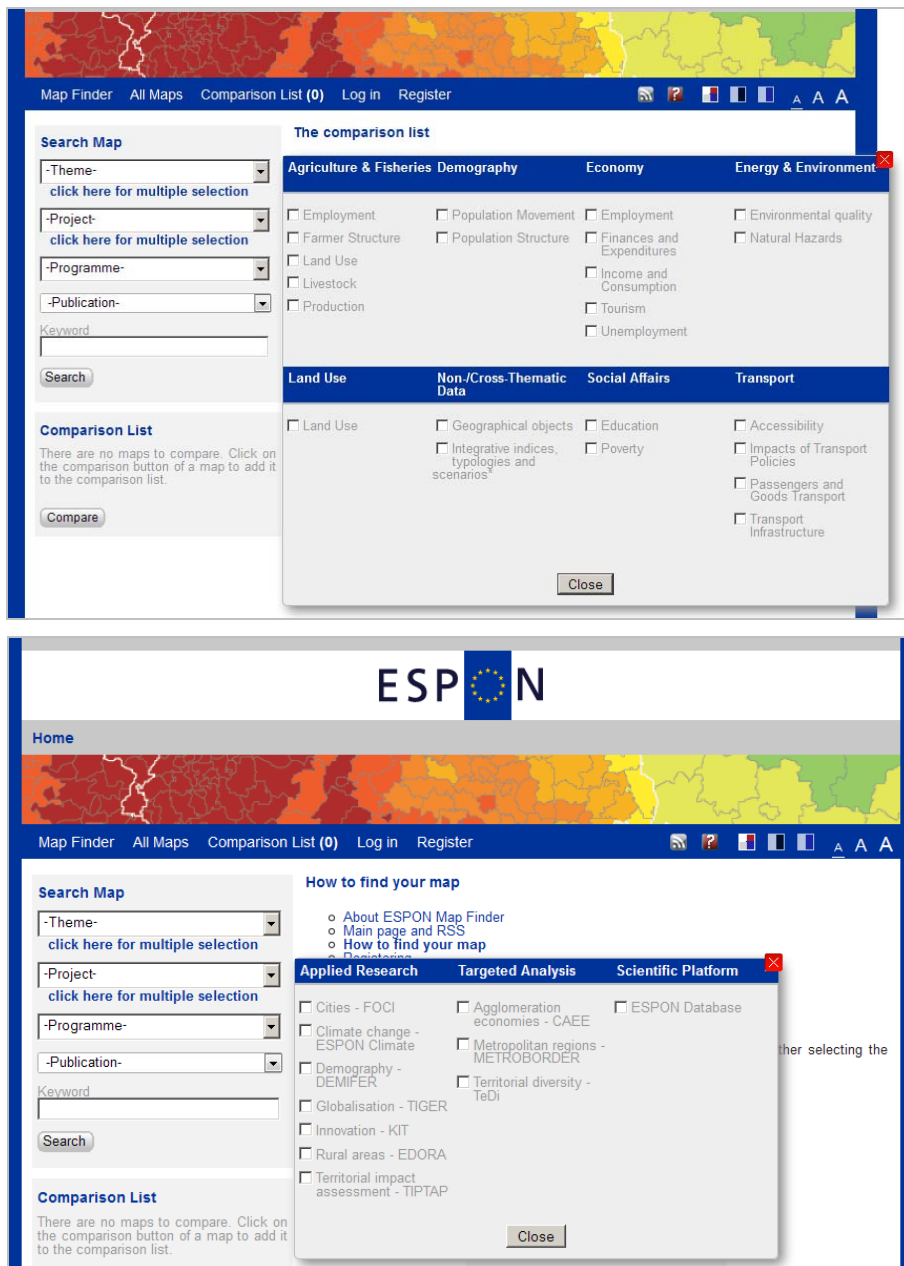
The search options allow you to look for a map using the criteria of theme, project, programme, publication, and keywords:

**Table 45. Search options of ESPON MAPFINDER tool**

By theme	By project	By publication	By programme
Agriculture and Fisheries	Demography - DEMIFER	First ESPON 2013 Scientific Report	ESPON Programme 2006
Demography	Rural Areas - EDORA	First ESPON 2013 Synthesis Report	ESPON Programme 2013
Economy	Climate Change - CLIMATE	Territorial Observation	
Energy and Environment	Cities - FOCl		
Land Use	Innovation - KIT		
Social Affairs	Globalisation - TIGER		
Transport	Territorial Impact Assessment - TIPTAP		
	Agglomeration economies - CAEE		
	Territorial diversity - TeDi		
	Metropolitan Regions - METROBORDER		
	ESPON Database		

Multi criteria searching are also allowed. This will open new windows that will allow checking only the themes (or projects) to be included in our search criteria. The system will return any map contained in at least one of the categories selected.

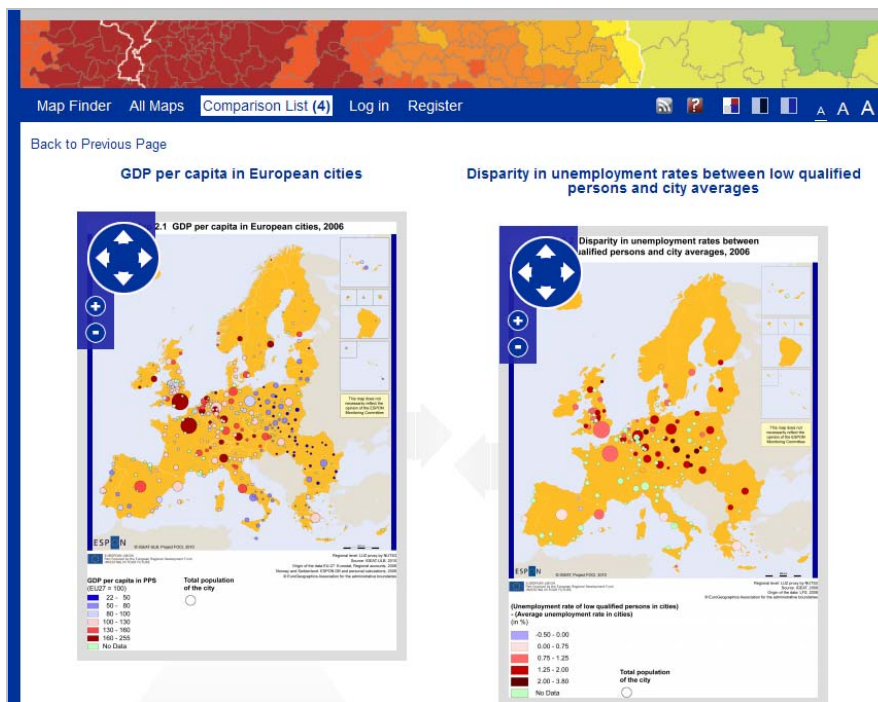
**Figure 15 View of Multi Criteria Searching Tool of Map Finder.**



It will be able to compare maps and explore them simultaneously and analyze their similitude and differences.



**Figure 16 Compare Maps Tool**



## 8. Elaboration of the Final Atlas

### 8.1. From the Analysis of Maps and Indicators to the Elaboration of the Atlas

During SWS 8 and 9 the information obtained through maps in light of the EU2020S was analysed in detail. That means not only interpreting the produced cartography and thus providing a clear diagnosis of the current territorial situation but also delivering strategic policy messages and recommendations inferred from the analysis. The analysis was done map by map, distributing the themes among partners (see Table 46). The analysis consisted of:

- An explanation of the position of the regions or cities on each map. In this analysis of the data, the use of macro-regions and ESPON types of regions will be helpful in order to express the situation of the different European macro-regions,<sup>94</sup> or the circumstances of the different region types.<sup>95</sup> The analysis will connect the specific situation of the topic with the EU2020S as a whole (making use of the EU2020S index when possible (see section 5 on how the EU2020 index was developed); for instance, this might allow us to explain if a worrying situation of some particular regions in one specific topic (i.e. unemployment in South West Europe) is thematically exclusive or it is part of an overall problematic regional

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94 ESPON only gives the indication of taking into consideration the Danube Space and the Baltic Sea macro-regions, in accordance with the recent EC decisions in this respect (European Union Strategy for the Baltic Sea Region – COM(2009) 248 final; European Union Strategy for the Danube Region – COM(2010) 715). However, the macro-regions for the remaining European space are problematic and indeed this has been a specific issue under discussion in the first two meetings of the SIESTA Steering Committee (Santiago, October 2011 and Paris, February 2012). The SIESTA Project Proposal included an early draft of macro-regions in order to fulfil the requirements of the ESPON Specification. Based on previous documents such as *Europe 2000 +. Cooperation for European Territorial Development* (European Commission, 1994) and the transnational macro-regional programmes of the EU territorial cooperation objective, seven macro-regions were identified: two compulsory following the Specification (the Danube Space and the Baltic Sea Region) and other five (Atlantic Axis, North West Europe, Mediterranean Basin, South East Europe and Northern Periphery). The Response on Inception Report has also taken into consideration Central Europe as a whole, South West Europe and the Alpine Space. Be that as it may, the macro-regional scale will not be integrated exhaustively in the Atlas or in the Project, but basically will be used to refer geographically to the patterns shown by the data, or in general to the other directions mentioned in this Inception Report.

95 ESPON region types (urban-rural, outermost, islands, coastal, etc.) are taken for granted and methodologically they do not represent a problem as they can be easily accessed at ESPON website. They will not be used exhaustively, but only when particular patterns shown by maps are clearly related to some of these region types and it makes sense to quote them. The use of the ESPON regional typology of urban-rural regions and metropolitan regions can be particularly important for providing specific considerations for urban areas, as specific maps for cities are scarce (see point 3.1.5). However, both urban-rural regions and metropolitan regions are based on NUTS3 and it is also true that maps at NUTS3 level are scarce (see section 3.1).

situation in relation to the EU2020S. In this sense, the *challenges* for regions in relation to each topic will emerge: it will be clear which topics each particular region has to face in order to bridge the gap until they attain the targets that the EU2020S states, which will lead to a recovery from the current crisis.

- These explanations were to benefit from previous ESPON Projects that have dealt with each one of the different themes. In this respect, they were used in order to explain the *reasons and causes* for the pattern associated with each map. For instance, the KIT Project states the underlying reasons for the existing differences in R&D or innovation development within the EU and the FOCI Project provides insightful information about the differences between cities in the EU. Grey literature and scholars' contributions were also useful. In this respect, it has to be mentioned that the distribution of themes (see Table 46) among partners was consistent with their research specialisation and that means that they are familiar with the relevant literature in each case.
- For each map or groups of maps a systematisation was done of the regions or cities suffering *weaknesses or challenges* because of their long distance from EU2020S indications.<sup>96</sup> Also the regions or cities which show *strengths or potentials* in a specific subject as they are near the EU2020S indications or even surpassing them were identified.<sup>97</sup> This can be expressed in terms of macro-regions or regions types. All this allowed us to draw up a *set of policy guidelines* for each map or group of maps, including:
  - Recommendations to improve the current situation, if it is weak for particular regions or cities, which can be referred through macro-regions or region types.
  - Recommendations to strengthen the current situation, if it is acceptable for particular regions or cities, which can be referred through macro-regions or region types.
  - Taking into consideration the macro-regions, opportunities for territorial cooperation on each one of the considered

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96 These indications from the EU2020S can be very clear and fixed, on the one hand, or can be orientations or recommendations, on the other. For instance, in the case of the headline targets (see sections 3.1 and 3.3 on which maps will show the distance from headline targets) the figure gives an exact indication of the direction that the EU2020S takes. But in other cases the EU2020S reports more a qualitative statement: for instance, it indicates that more efforts must be made in fighting against the gender inequalities in terms of unemployment.

97 The use of the SWOT jargon for analysing the territorial dimension of the EU2020S is inspired by the insightful essay by Böhme, K. et al. (2011), *op. cit.*, pp. 77-78.

topics are likely to emerge, conferring additional value to existing cooperation through the EU – member states.

These thematic policy guidelines were partially based on the EU2020S itself and all the related documentation, through analysis carried out during SWS1 and available reports such as the Annual Growth Survey monitoring the fulfilment of the headline targets and assessing the implementation of the flagship initiatives. The results of these analyses of maps are reflected in specific papers for each one of the subsections of the Atlas, as expressed in Table 46. Annexes A to F of this report correspond to these scientific papers.

**Table 46 Distribution of Topics between Project Partners.**

<i>Pillar</i>	<i>Subsection of the Atlas</i>	<i>Partner in charge</i>
Smart Growth	Research and innovation	P7
	Education	
	Digital society	P5
Sustainable Growth	Competitiveness and economic growth	P3
	Green economy, climate change and energy	P4
Inclusive Growth	Employment, skills and jobs	P6
	Poverty and exclusion	P2

## **8.2. Final Atlas Elaboration**

The Atlas has been prepared as a synoptic and comprehensive overview of the results of the Project. It is the main output of SIESTA given that it presents the situation of the European regions (and, when possible, cities) in relation to the EU2020S. The basic aim of the Atlas is to inspire policymakers and practitioners so that they grasp the spatial dimension of the EU2020S.

All the methodological flow of SIESTA has been devoted to the selection of the maps that are worthwhile considering for the Atlas, taking into account data availability. In addition, the methodological flow has also included the elaboration of texts that have been the basis for the Atlas. However, there are several comments that need to be stressed when referring specifically to the elaboration of the Atlas.

First of all, it has to be said that the contents have been rescheduled, following the comments raised by ESPON CU and the SB in the meeting held in May 2012 in Santiago. The sustainable growth (economic growth) section has been located at the forefront, although the original EU2020S

puts the section in smart growth first. This has been done in order to highlight that growth itself is the first and foremost important topic of the EU2020S.

The Lead Partner has structured the Atlas following the layout facilitated by ESPON CU, specifically the one used for the Territorial Observation series. Also the ESPON Atlas 2006 has been intensively checked and used in this respect.

From the indicators (thus, maps) that were decided in SWS3 to the definitive maps that have been included in the Atlas there have been slight changes that can be summarised in the following paragraphs. In the meeting in May 2012 there was a recommendation raised by ESPON CU and the SB that maps should be less; the final list obtained in SWS3 was 81 and the Specification recommended around 50. For this reason, it was agreed that, when possible and consistent with the thematic analysis carried out, the figure of maps might be reduced. Table 47 shows the maps that have been deleted and the following points explain the underlying reasons for such decisions:

- In the cases of maps 22 and 33, the analysis of results was quite complicated and, in the context of an Atlas addressed to policy-makers, it was understood as too complex. At least it required an additional map of the total figure of patents per regions, beyond the map of density of patents per capita (map 9).
- In the cases of maps 19, 48, 71, 73 and 78 the lack of available data for several urban areas was understood as severe. At a first glance their analysis was considered worthwhile, but afterwards it was considered omissible.
- In the case of map 49, the same weakness as the previous point was reported, but in this case specifically the lack of available data for several regions.
- In the case of map 8, it was considered redundant with the other map 5. It offered some interesting differences but, in order to clarify, the explanation within the Atlas, it was discarded. The same is applicable for 2 of the 4 maps that were amalgamated into map 81; the extra information that added the official retirement age in relation to the real retirement age was incorporated into a graphic (Graphic 4.5 in the Atlas) instead of including 2 additional maps more.
- In the case of map 58, although an attempt was made to obtain the dataset for 2007-2011 at NUTS3, finally it was only possible to represent 2007-2009 and it was considered that this was not

consistent with SIESTA's own methodological decisions, which considered that for truly embracing the years of crisis the evolution had to be done for 2007-2011.

Be that as it may, it has to be highlighted that these maps were analysed in the context of the reports elaborated by the different partners and that means that they were effectively considered in the analysis but have been discarded later.

**Table 47. Indicators/Maps not Definitively Included in the Atlas**

Indicator	Map
Green technology patent applications to the EPO	33
Share of journeys to work by car in LUZ	48
Coverage rate of municipal waste collection	49
Employment in knowledge-intensive activities	8
Share of population having completed tertiary education aged group 25-64	19
ICT patent applications as % of total patent application	22
Change in the unemployment rate	58
Median disposable annual household income in LUZ	71
Percentage of households with less than 60% of the national median annual disposable income in LUZ	73
Proportion of long-term unemployed aged 15-24 in LUZ	78
Life expectancy at the official age of retirement (female)	81f
Life expectancy at the official age of retirement (male)	81m

In relation to the texts of the Atlas, as stated above, their confection began with the reports of the different Project Partners. However, the text has been consistently expressed and structured, with a clear story line, by the Lead Partner, as committed to the Revised Inception Report. As compromised as well, the Atlas has strongly benefited from all the policy documents that were checked in SWS1 by the Lead Partner: from the EU2020S directly related documentation to key documents in regional and cohesion policy, as widely expressed in section 3 of this Scientific Report, devoted to EU2020S analysis. The thematic analyses that have contributed to develop the texts of the Atlas are as follows:

- Annex A, on Competitiveness and Economic Growth, developed by Adam Mickiewicz University in Poznan team.
- Annex B, on Green Economy, climate change and energy, developed by University Mediterranea of Reggio Calabria team.
- Annex C, on Research and Innovation, developed by University College Dublin team.

- Annex D, on Education, developed by University College Dublin team.
- Annex E, on Digital Society, developed by Hellenic Open University team.
- Annex F, on Employment, Skills and Jobs, developed by University of Bucharest team.
- Annex G, on Poverty and Exclusion, developed by the National Centre for Scientific Research of France team.

These contributions have benefited from the development of the Atlas done by the Lead Partner, taking into account that comments on the maps are very long in these reports and had to be transformed into short, communicative and strategic texts, expressing a true analysis rather than a description. In addition, the Lead Partner has prepared graphs and tables in order to illustrate the Atlas and has completely written the section on poverty, as well as the introduction, the chapter on the EU2020S itself and conclusions. In relation to this former section, it has to be said that the aggregate index development and the clustering analysis developed by the Lead Partner have been the main contents included therein, beyond the mere conclusions derived from the overall Atlas.

### **8.3. Atlas Revision after ESPON CU and SB feedback**

After the revision of the Atlas in its Draft Final Report version carried out by ESPON CU and the SB, it was decided to modify the document into an Atlas in its final version, as follows:

- The text was modified in order the maps were discussed in a simpler and easier way, accessible for policy-makers, stakeholders and practitioners and for a wider audience. This would help the reader to identify the key findings of each individual map. In this respect, the text was finally adjusted by means of bullet points with the key messages instead of paragraphs when referring to the central maps of the Atlas. In addition, the comments were slightly modified in order it was clearer which were the territorial opportunities, challenges and potentials for each map and some policy recommendations and benchmark were introduced, when possible and applicable. Furthermore, in order to make more evident the territorial approach carried out in the analysis of the EU2020S and emphasise the diversity of the European regions and cities as territorial development opportunities and constraints, the headings of each one of the subsections and points were deliberately re-written with a territorial approach. Considerations on

the methodological issues and the more technical explanations were left for the Scientific Report. If the Atlas in the Draft Final Report had had more than 110 p., the Atlas in the Final Report significantly reduced its length (around 70 p.). This was specifically stated by the ESPON CU, which requested downsizing the number of pages.

- With regard to the maps, several technical specifications were raised, including considerations on colours, legends and the representation of specific countries (mainly, Cyprus), according to the decision approved in the ESPON MC in relation to this issue and included in the Guidance available on the ESPON intranet. All the maps were adapted in this respect by SIESTA LP and MCRIT. In addition, it was decided to reduce the set of maps in order to produce the final Atlas according to the original Specifications of the Project (around 50 maps) and given that ESPON CU stated that the number of maps included in the Atlas should be reduced in order to reduce the length of the report. However, maps not included in the Main report were included in the Annexes and considered in the Scientific Report when applicable. It must be mentioned that Table 48 reports specifically on the definitive list of maps of the Atlas, comparing with the previous Atlas version and including, when applicable, the previous codes of each one of the maps or indicators along all the scientific workflow.

The figure of maps had been 76 in the Draft Final Report and was finally 50 in the Final Report. Importantly, this reduction caused a significant loss of comments and several analysis already done were missed (even though, they are in the Annexes and the Draft Final Report Atlas version). The reduction of maps was done as follows:

- ESPON CU and the SB asked for specific deletions of sections that were considered not central for the EU2020S analysis. This was the case of the points on debt (2 maps), challenges for sustainable growth (including commuting, the Natura 2000 Network and pollution,<sup>98</sup> thus 3 maps), ageing (4 maps) and two challenging working sectors (health sector and public workers, thus 2 maps). This resulted in a final version of the Atlas where the maps and comments are absolutely focused on the specific contents of the EU2020S documentation.

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<sup>98</sup> With regard to this issue, ESPON CU facilitated a map on environmental pressures on European coasts to be discussed by the SIESTA TPG if pertinent for the Atlas. This map was analysed by the partner whose allocated themes are green economy, climate change and energy (see Annex B). Finally, it has not been included in the Atlas, but it is listed in point 4.2.7.2 of this Scientific Report.



- Some specific maps were discussed in the sense that the results being represented were unclear. That was the case of the map on high-technology trade share, the map on NBIC specialisation, the map on headquarters of transnational firms, or the map of the GHG emissions at the world scale (that was considered not substantial in the sense that almost all the countries that were represented are in Europe, thus in fact the map focusing on Europe explains the same than the global one). These maps had been actively considered in the previous versions of the Atlas but finally were not included.
- Some maps were finally deleted because the datasets were referring to several years (the maps had been elaborated using combined years), thus some of the patterns obtained were contradictory and very difficult to justify. This was the case of the maps on youth unemployment or the unemployment rate, both for LUZs, that were for datasets from 2004 to 2008 (covering pre-crisis and crisis years). However, a map on LUZ drop-out rate, whose datasets combine years from 2004 to 2008, was maintained given that this is quite a structural indicator.<sup>99</sup> Unfortunately, this globally caused a considerable reduction of maps referring to urban areas in the Atlas, a result that it is directly derived from the enormous data availability problems reported above in this Scientific Report (see point 4.2.2).
- Other maps were not finally included because were redundant with other maps, for instance the map on young people NEET (not in work, education or training), that is a combination of data on young people unemployment and tertiary education, the former and the latter being present in the Atlas. The same was applicable to the map on GDP per head for LUZs, that is a proxy of data for NUTS3, a map that it is also present in the Atlas. The map on regional disposable income can also be indirectly inferred from the map on people at-risk-of-poverty. And one of the maps of the headline target on poverty was eventually dismissed because the dataset is the same but two maps had been initially included in order to explain the patterns differently.

In any case, the maps on the headline targets, represented as the static situation, the distance to the EU2020S national targets and the trend, were maintained when they do exist. This was consistent with the consideration along all the scientific workflow that these data are “compulsory indicators” for SIESTA (see point 4.1.2.1 of this Scientific Report).

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<sup>99</sup> The map on change in regional drop-out rate from 2000 to 2010 shows a revealing stability.

**Table 48. Indicators/Maps along the Workflow**

Code [ ] <sup>100</sup>	Code @ <sup>101</sup>	Map in the Definitive List of Indicators <sup>102</sup>	Draft Final Report	Final Report
		Map 1. 2020 index.		
		<b>SMART GROWTH</b>		
		<b>Innovation</b>		
[2]	@1	Map 2. R&D expenditures as % of GDP.	3.1	3.1
[2]	@1	Map 3. R&D expenditures as % of GDP. Distance to national targets.	3.2	3.2
[2]	@1	Map 4. R&D expenditures as % of GDP. Trend.	3.3	3.3
[4]	@2	Map 5. Human resources dedicated in science and technology.	3.4	3.4
		Map 6. NBIC projects per urban area population. Urban areas.	3.7	
[46]	@3	Map 7. Business R&D expenditures as % of GDP.	3.5	3.5
		Map 8. Employment in knowledge-intensive activities as % of total employment.		
[49]	@5	Map 9. Total patent applications per capita.	3.6	3.6
[49]	@5	Map 10. High-tech patent applications as a % of total patent applications.		
		<b>Education</b>		
[6]	@6	Map 11. Early school leavers.	3.8	3.7
[6]	@6	Map 12. Early school leavers. Distance to national targets.	3.9	3.8
[6]	@6	Map 13. Early school leavers. Trend.	3.10	3.9
[6]	@6	Map 14. Proportion of students not completing their compulsory education. Urban areas.	3.11	3.10
[7]	@8	Map 15. Tertiary educated as % of age group 30-34.	3.12	3.11
[7]	@8	Map 16. Tertiary educated as % of age group 30-34. Distance to national targets.	3.13	3.12
[7]	@8	Map 17. Tertiary educated as % of age group 30-34. Trend.	3.14	3.13
		Map 18. Share of population having completed tertiary education (age group 25-64).		
		Map 19. Share of population having completed tertiary education (age group 25-64). Urban areas.		
		Map 20. Share of young people NEET.	3.15	
		<b>Digital Society</b>		
		Map 21. Share of people working in the ICT sector.	3.16	3.14
[45]	@5	Map 22. ICT patent applications as a % of total patent applications.		
[52]	@13	Map 23. Broadband penetration.	3.17	3.15
[54]	@14	Map 24. Share of population buying online.	3.18	3.16
	@17	Map 25. Share of population that have never used a computer.	3.19	3.17

100 See Table 12 and point 4.1.1 of this Scientific Report.

101 See Table 12 and point 4.1.1 of this Scientific Report.

102 See points 4.1.3 and 4.1.3.1 of this Scientific Report.

Code [ ] <sup>103</sup>	Code @ <sup>104</sup>	Map in the Definitive List of Indicators <sup>105</sup>	Draft Final Report	Final Report
		<b>SUSTAINABLE GROWTH</b>		
		<b>Competitiveness and Economic Growth</b>		
[10]	@33	Map 26. Growth measured as GDP per capita in pps.	2.1	2.1
[10]	@33	Map 27. Growth measured as GDP per capita in pps. Urban areas.	2.2	
[9]	@32	Map 28. Growth measured as GDP per capita in pps. Trend.	2.3	2.2
[9]	@32	Map 29. Growth measured as GDP per capita in pps variation in the years of crisis. Trend.	2.4	2.3
[118]	@34	Map 30. Labour productivity.	2.7	2.4
[50]	@35	Map 31. Contribution of medium-tech and high-tech products to the trade balance.	2.8	
		Map 32. Number of headquarters of transnational firms. Urban areas.	2.10	
		Map 33. Green patent applications as a % of total patent applications.		
		Map 34. Public debt in % of GDP.	2.5	
		Map 35. Public debt in % of GDP in the years of crisis. Trend.	2.6	
		<b>Green Economy, Climate Change and Energy</b>		
		Map 36. Regional estimation of GHG emissions.	2.22	2.14
[3]	@26	Map 37. Variation of GHG emissions compared to 1990 levels.	2.19	2.12
[3]	@26	Map 38. Variation of GHG emissions compared to 1990 levels. Distance to national targets.	2.21	2.13
[4]	@27	Map 39. Share of renewable energy in gross final energy consumption.	2.11	2.5
[4]	@27	Map 40. Share of renewable energy in gross final energy consumption. Distance to national targets.	2.12	2.6
		Map 41. Wind energy potential.	2.13	2.7
		Map 42. Solar energy potential.	2.14	2.8
[5]	@28	Map 43. Energy intensity of the economy.	2.15	2.9
[5]	@28	Map 44. Energy intensity of the economy. Distance to national targets.	2.16	2.10
[5]	@28	Map 45. Energy intensity of the economy. Trend.	2.17	2.11
[121]	@23	Map 46. Share of employment in industries with high energy spending in total employment.	2.18	
		Map 47. Share of people commuting in total employment.	2.23	
		Map 48. Share of journeys to work by car. Urban areas.		
[69]		Map 49. Rate of municipal waste collection.		
[69]		Map 50. Urban waste-water treatment capacity.	2.24	
[71]	@38	Map 51. Protected areas included in the Natura 2000 network as a share of total area.	2.25	

103 See Table 12 and point 4.1.1 of this Scientific Report.

104 See Table 12 and point 4.1.1 of this Scientific Report.

105 See points 4.1.3 and 4.1.3.1 of this Scientific Report.

Code [ ] <sup>106</sup>	Code @ <sup>107</sup>	Map in the Definitive List of Indicators <sup>108</sup>	Draft Final Report	Final Report
		<b>INCLUSIVE GROWTH</b>		
		<b>Employment, Skills and Jobs</b>		
[1]	@41	Map 52. Employment rate of age group 20-64.	4.1	4.1
[1]	@41	Map 53. Employment rate of age group 20-64. Distance to national targets.	4.2	4.2
[1]	@41	Map 54. Employment rate of age group 20-64. Trend.	4.3	4.3
[32]	@42	Map 55. Gender balance in employment of age group 20-64.	4.4	4.4
[18]	@51	Map 56. Unemployment rate.	4.5	4.5
		Map 57. Unemployment rate. Urban areas.	4.7	
		Map 58. Unemployment rate. Trend in the years of crisis.		
		Map 59. Gender balance in unemployment.	4.6	
		Map 60. Gender balance in unemployment. Urban areas.	4.8	
[25]	@52	Map 61. Youth unemployment rate.	4.9	4.6
		Map 62. Youth unemployment rate. Urban areas.	4.10	
[35]	@44	Map 63. Lifelong learning participants.	4.11	4.7
		Map 64. Share of low-educated population.	4.12	4.8
		Map 65. Share of people qualified at level 1 or 2 ISCED. Urban areas.	4.13	
[91]	@54	Map 66. Professionals in health sector per 1000 inhabitants.	4.15	
	@46	Map 67. Staff working in the public sector.	4.14	
		<b>Poverty and Exclusion</b>		
[8]	@47	Map 68. People at risk of poverty or social exclusion rate.	4.16	
[2]	@1	Map 69. People at risk of poverty or social exclusion rate. Distance to national targets.	4.17	4.9
[2]	@1	Map 70. Disposable income per capita in pps.	4.18	
[2]	@1	Map 71. Median disposable annual household income in pps. Urban areas.		
[4]	@2	Map 72. At risk of poverty rate.	4.19	4.10
		Map 73. Share of households with less than 60% of the national median annual disposable income. Urban areas.		
[46]	@3	Map 74. At risk of poverty rate. Trend.	4.20	4.11
		Map 75. Share of severely materially deprived people in total population.	4.21	4.12
[49]	@5	Map 76. Share of people living in households with very low work intensity.	4.22	4.13
[49]	@5	Map 77. Share of long-term unemployment.	4.23	4.14
		Map 78. Share of long-term unemployment. Urban areas.		
[6]	@6	Map 79. Ageing index.	4.24	
[6]	@6	Map 80. Ageing index. Urban areas.	4.25	
[6]	@6	Map 81. Relation between the retirement age and life expectancy.	4.26/27	

106 See Table 12 and point 4.1.1 of this Scientific Report.

107 See Table 12 and point 4.1.1 of this Scientific Report.

108 See points 4.1.3 and 4.1.3.1 of this Scientific Report.

# 9. Policy Recommendations

## 9.1. Introduction

The Europe 2020 (EU2020S) is the growth strategy of the European Union to overcome the current crisis. This strategy is driven towards a smart, sustainable and inclusive economy in Europe. These three priorities should help the European Union to reach high levels of employment, productivity and social cohesion by 2020. The EU2020S contemplates three priorities or pillars which integrate seven flagship initiatives:

- Smart Growth
  - Digital agenda for Europe
  - Innovation Union
  - Youth on the move
- Sustainable Growth
  - Resource efficient Europe
  - An industrial policy for the globalisation era
- Inclusive Growth
  - An agenda for new skills and jobs
  - European platform against poverty

In this document, we take a similar structure but based on the SIESTA Atlas, as you can appreciate above in the table of contents. Starting from this point, the document attempts to explain the current situation in Europe at regional scale (NUTS2 and NUTS3) identifying a set of main ideas, potentials and challenges in order to point out several policy recommendations or opportunities.

## 9.2. Smart Growth

### 9.2.1. Research and Innovation

Main Ideas

- The levels of investment in R&D in Europe are lower than in other regions, particularly Japan and Korea. The median level of investment in R&D in these countries from 2007-2010 (3.45% of GDP in Japan and 3.29% of GDP in Korea) was significantly higher than in the EU-15 (2.03% of GDP) and particularly the EU-27 (1.95% of GDP).

- The percentage of human resources in science and technology, as part of the active economic population, is higher than 25% in most of the European regions [See Map 20: Human resources in science and technology, 2010].
- Although in the period 2003-2009 there was a slight increase in total R&D expenditure, the effort is still not enough. Europe is far from reaching the 3% requirement in the EU2020S [See Map 21: Total expenditure in Research & Development, 2009].
- It is possible to find a positive correlation among expenditure on R&D and the production of patents [See Map 22: Patent applications to the EPO, 2008].

#### *9.2.1.1. Human Resources in Science and Technology*

##### Potentials

- North West Europe, the Atlantic Axis (with the exception of Portugal) and the Baltic Sea Region (with the exception of Poland) maintain a high level expenditure in human resources in science and technology.
- In general, the capital and big urban conglomerations are those which stand out as centres of human resources in science and technology.
- The case of Switzerland stands out due to reaching percentages superior to 45 % in the whole of the State.

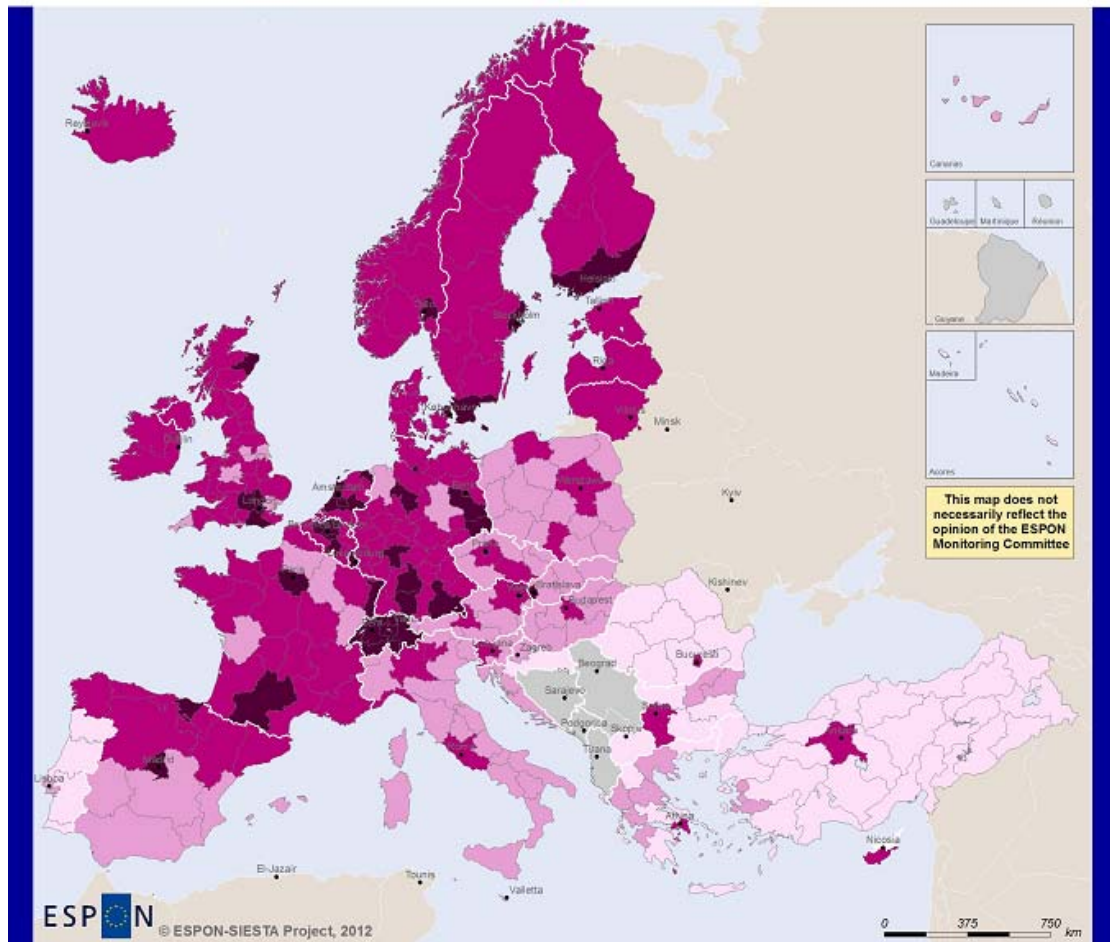
##### Challenges

- It is possible to distinguish three main weak patterns in the percentage of human resources in science and technology:
  - The Danubian Space has low levels of human resources in science and technology, with the exception of the regions that are located in the capital cities such as Warsaw, Prague and Budapest.
  - In the Mediterranean Basin the levels are below those desired by the EU2020S, with the exception of the Northern Spanish regions and the Italian regions of Lombardy, Liguria and Lazio.
  - South East Europe has the worst levels of qualification in human resources in science and technology, especially in the case of Romania, Bulgaria and Turkey. Again, the exceptions are in the main capital cities such as Ankara, Bucharest and Athens.

## Opportunities

- The Danube Space and South East Europe are open to the Bologna Process. This will allow them to not only share knowledge but also know-how and good practices. Their incorporation in Europe offers them more opportunities to develop mobility among teachers, students and researchers throughout the European universities.
- Once the Bologna Process is implemented in the Mediterranean Basin, it could be the time to take advantage of synergies with Central and North-Western Europe, reviewing national policies on education, especially in the Portuguese case.
- It could be necessary to review the correlation between university education and its correspondence to the labour market, especially in Northern Spain, where there is a high percentage of human resources in science and technology and high levels of unemployment.
- To promote active participation of the territorial agents and the business world in the design of the formative and investigative programmes.
- To establish programs of modernisation in the universities.
- To guarantee teaching quality, evaluating periodically the investigative trajectory of the professors (projects realized, publications, advised theses, attendance at international and/or national congresses, etc.)
- New technologies are the opportunity to open new models of cooperation among universities:
  - Creating authorized interuniversity teaching programmes.
  - Promoting the e-learning system, so that education comes to all the regions of Europe, benefiting the groups with less opportunities for accessing post-secondary education (rural, mountainous regions, outermost, sparsely populated, islands).
- To encourage the constant and quality education of the workers in the private sector through educative proposals that begin with the university setting (courses of specialization and improvement).

**Map 20 Human Resources in Science and Technology, 2010**



ESPON  
 © ESPON-SIESTA Project, 2012  
 EUROPEAN UNION  
 Part-financed by the European Regional Development Fund  
 INVESTING IN YOUR FUTURE

Regional level: NUTS2  
 Source: EUROSTAT  
 Origin of data: EUROSTAT, 2012  
 © EuroGeographics Association for administrative boundaries

**Percentage of economically active population (%), 2010.**

- < 25%
- 25% - 35%
- 35% - 45%
- > 45%
- No data

Notes:  
 Data for CH are shown for 2009.



### 9.2.1.2. Total Expenditure in R&D

#### Potentials

- In relation to total expenditure in R&D (public and private) it is possible to emphasize two main corridors:
  - o The Central Corridor from London to Graz.
  - o The Baltic Sea Corridor from Copenhagen to Helsinki with extension to the North of Finland.
- Likewise, there are specific cases highlighted as the Paris Region, Midi Pyrenees, Aberdeen and Iceland.
- When analyzing private investment in R&D, in addition to the above there is a third corridor from Berlin to Toulouse via Munich, Zurich and Rhone Valley.

#### Challenges

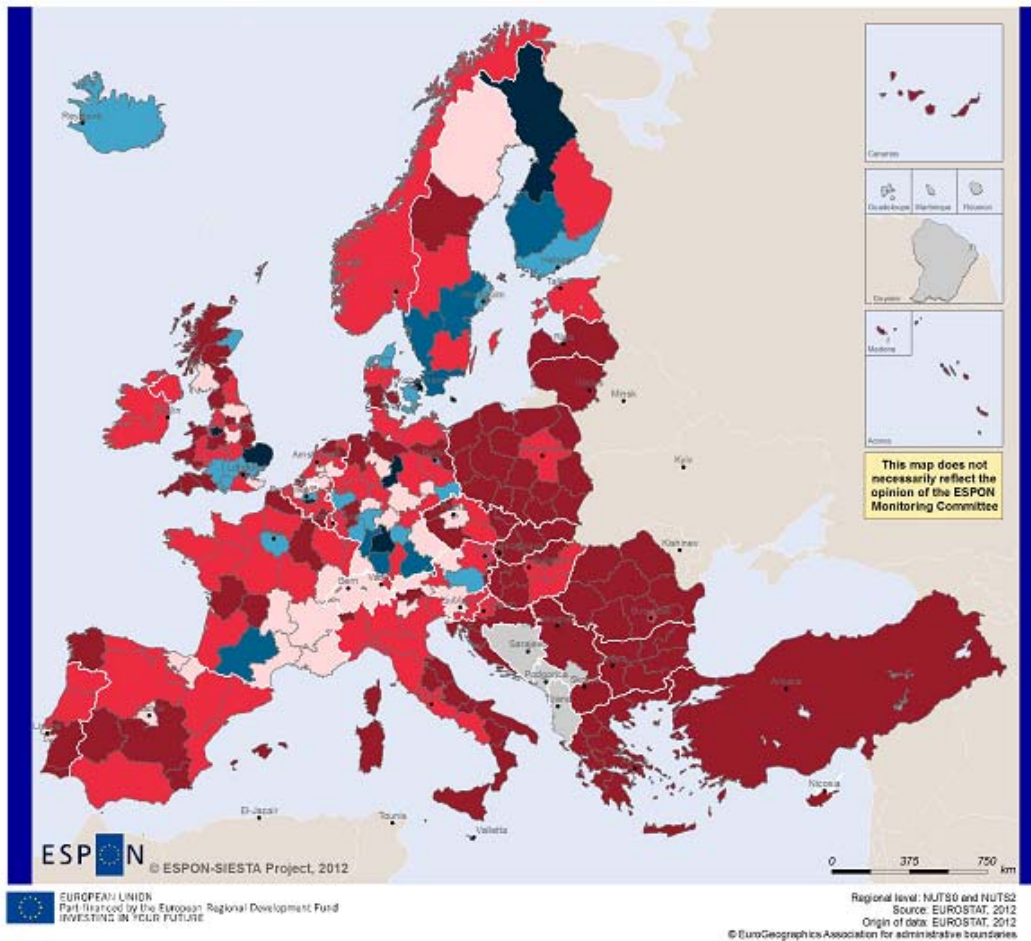
- The absence of investment in R&D diminishes the competitiveness of the European regions and brakes economic growth.
- In 2007, only 19 of 287 NUTS2 regions met the 3 % of GDP target established by the EU2020S. If the European regions want to be competitive it is necessary to increase the investment in R&D.
- No Eastern European region complies with the targets of the EU2020S. Their R&D spending always maintains values inferior to 2 %.

#### Opportunities

- Investment and diversification in R&D should be promoted by governments, institutions and businesses.
- In contexts of economic crisis the investment in R&D is strategic to assure the competitiveness of the regions and their economic growth.
- Collaborative networks should be established, as well as R&D benchmarking methodologies across Europe.
- The collaboration between entrepreneurs and researchers is crucial. It is necessary that the companies become more involved in the processes of R&D, with separate departments and large investments in this area (for example the case of Nokia as an example in Finland), with collaboration agreements with university research groups for participation in research projects.
- Fiscal incentives for the creation of managerial research clusters with a multidisciplinary character.

- The research should adapt to the new demands of the European economy and society (new products, services, social needs, new models for marketing, etc.).
- It would be necessary to look for new niche markets, ensuring that the outputs from R&D will be used for countries outside Europe.
- To improve the administrative and management processes in R&D in the universities, counting on offices specializing in the design of projects, taxation authority, audits and accompanying tasks.

**Map 21 Total Expenditure in Research & Development, 2009**



**R&D in Regional GDP (%) 2009.**  
**EU 2020 Target = 3%**

**Below EU 2020 Target**

- 0% - 1%
- 1% - 2%
- 2% - 3%

**Above EU 2020 Target**

- 3% - 4%
- 4% - 5%
- > 5%

No data

**Notes:**  
 Research and experimental development (R&D) comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of this stock of knowledge to devise new applications.

Data for RS were provided by the Statistical Office of the Republic of Serbia.  
 Data for TR, CH and NO are all available for country level.  
 Data for MK are shown for 2007.  
 Data for EL are shown for 2005 and RS is shown for 2010.

### 9.2.1.3. Patent Applications to the EPO

#### Potentials

- Analyzing the production of patents in Europe, it is possible to discover two main poles:
  - o Northern Italy (Veneto, Emilia Romagna, Lombardy, Piedmont) with extension into the Rhone Valley.
  - o Bavaria and the Southern Germany with extension to Noord Brabant, in Southern Netherland, via Westphalia and Hessen.
- In the rest of Europe, some isolated regions such as the large urban area of Paris, Stockholm and Helsinki-Karelia are emphasized.

#### Challenges

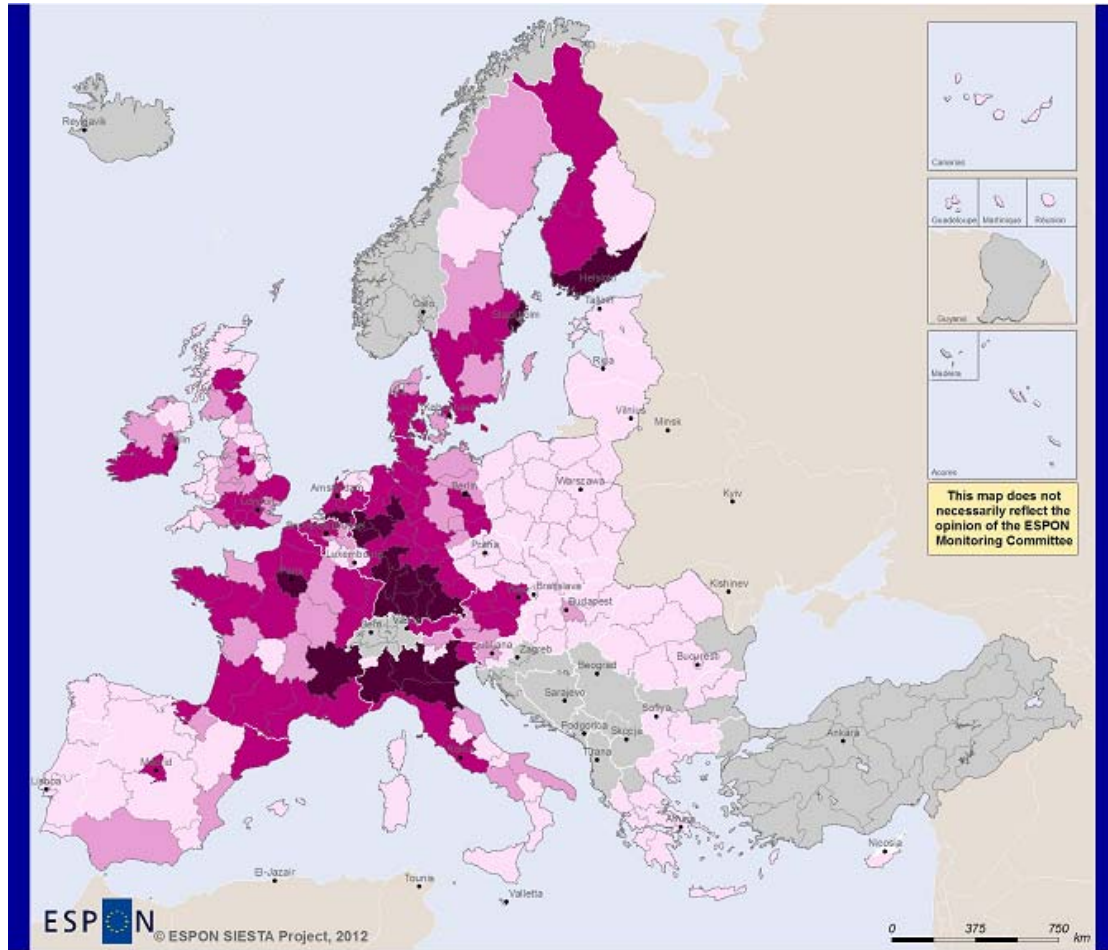
- The greatest weakness is observed in Eastern Europe, including the Baltic regions of Estonia, Latvia and Lithuania. The Iberian Peninsula and Southern Italy suffer similar problems.
- Particularly striking is the lack of correlation between human resources in science and technology and the production of patents. For example, the Baltic Republics and Northern Spain have a high level of human resources in science and technology which does not correspond to the volume of patents generated.
- As an exception, but opposite to the above, are the regions with low R&D and/or medium levels of human resources but with a high number of patents, such as Northern Italy.

#### Opportunities

- Competitive regions with a long industrial tradition (Northern Italy, the Basque Country or Catalonia) maintain a significant number of generated patents. However, if these regions stop the spending on training and innovation the situation could turn around
- Supporting businesses and encouraging entrepreneurs to invest in R&D could improve the production of patents in the private sector.
- To encourage the patents production at EU level:
  - Improving the management processes in the patents procedure.
    - o Respecting the copyright.
    - o Improving the management processes in the patents procedure.

- Spreading the patents and place a value on them in EU and foreign markets.
- To promote patent creation in Social sciences and Humanities education.

### Map 22 Patent Applications to the EPO, 2008



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Regional level: NUTS3, NUTS2, NUTS0  
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#### Number of total patent application, 2008



Notes:  
Data refer to applications filed directly under the European Patent Convention or to applications filed under the Patent Co-operation Treaty and designated to the EPO (Euro-PCT). Patent applications are counted according to the year in which they were filed at the EPO and are broken down according to the International Patent Classification (IPC). They are also broken down according to the inventor's place of residence, using fractional counting if multiple inventors or IPC classes are provided to avoid double counting.

## 9.2.2. Education

### Main Ideas

- Europe does not meet the targets set by the EU2020S (under 10%) in relation to early leavers from education and training except Eastern Europe and specific regions of Central Europe and the Baltic Sea Region [See Map 23: Early leavers from education and training, 2010].
- Many regions of Western Europe and the Baltic Sea Region keep a level of total population aged 30-34 with tertiary education above the EU2020S targets (40%). [See Map 24: Population aged 30-34 with a tertiary education, 2010].

#### *9.2.2.1. Early Leavers from Education and Training*

### Potentials

- The Central and Western Danube Space and some Baltic Sea regions, especially in the South, register the lowest rates of school dropout.
- In Western Europe the regions with a better position are in France, Ireland, Switzerland and specific regions of Benelux and Germany.

### Challenges

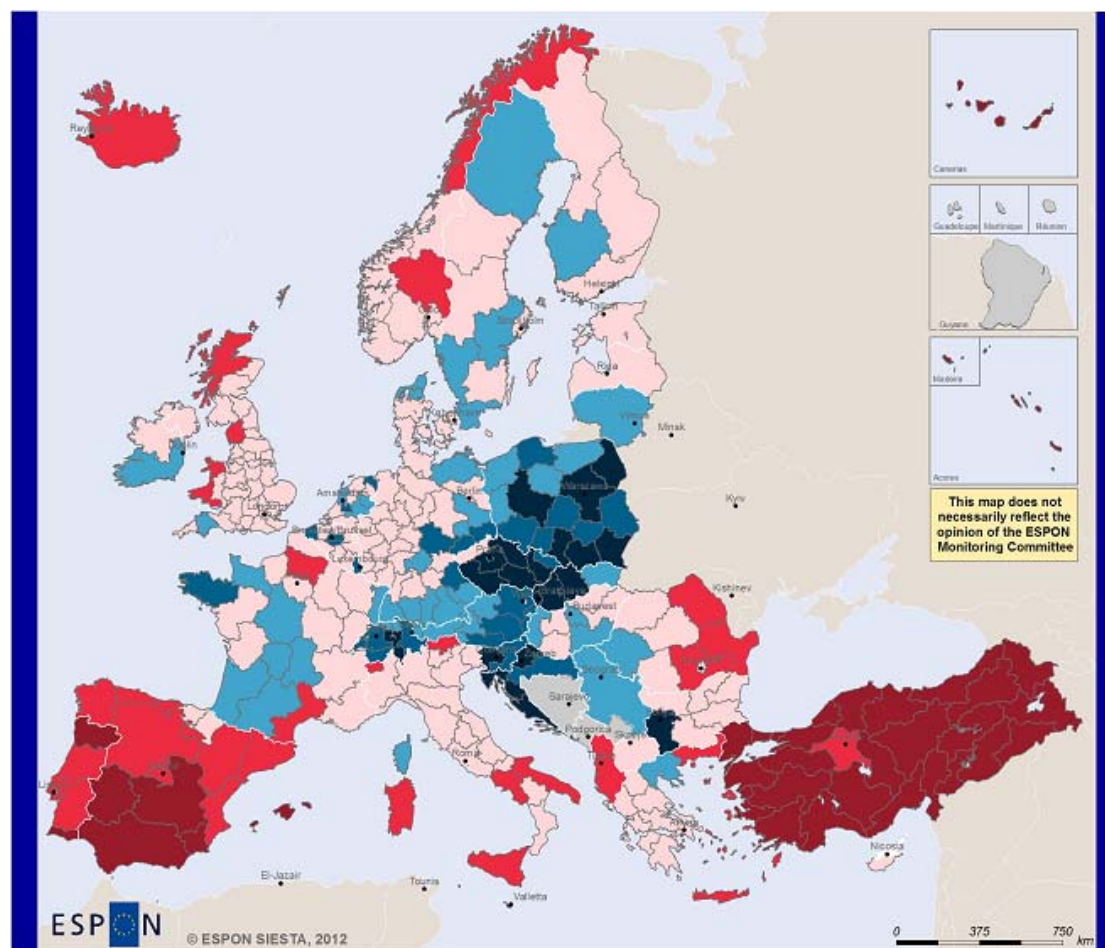
- The Mediterranean Basin and South East Europe have the highest school dropout of Europe, especially acute in Spain, Portugal and Turkey. These countries have the largest number of NINIS as well.
- In general, islands and peripheral coastal regions also have higher dropout rates (Finland, Iceland, Highland, Wales, Balearic Islands, Corsica, Sicily, and Crete).
- A higher school dropout rate exists in the cities rather than in the rural regions.

### Opportunities

- In some regions it is necessary to improve the attractiveness of educational programs, adapting them to the labour market demand and the current social reality.
- To create alternative programs of professional training directed towards young people who decide not to continue with higher education.

- As in the German case, professional training done by the companies is proposed, so that the young worker acquires constant training adapted to real needs.
- To increase and/or to improve the tracking and orientation services for the pupils, guiding them in their educative and labor expectations, and helping them in the problem solving.
- In the cities and socially problematic neighbourhoods a better tracking and accompanying of the pupils is necessary. The schools, through personnel specializing in difficult groups, can encourage the pupils to get involved in activities that have a repercussion abroad (exhibitions, mass media, congresses, etc.), creating work groups and/or games, taking part in competitions, etc. It is a question of motivating placing a value on the positive aspects.
- To analyze the causes school dropout and to establish a comparative analysis with the successful regions of Eastern Europe (Czech Republic and Slovakia).
- To realize awareness campaigns on the value of Routh education, avoiding the escape towards "easy" and/or temporary professional opportunitites (construction, tourism, hotel and restaurant sector).
- Provide equal opportunities in access to education for the whole population, taking special care in the poorer and peripheral regions, represents a duty for Europe.

**Map 23 Early Leavers from Education and Training, 2010**



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Regional level: NUTS2 and NUTS0  
 Source: EUROSTAT, MS NRP's, DG REGIO, Seventh Report  
 on Economic, Social and Territorial Cohesion  
 Origin of data: EUROSTAT, 2011  
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**Percentage of population aged 18-24 (%) 2010.**  
**EU 2020 Target = 10%**



Notes:  
 Early leavers from education and training refers to persons aged 18 to 24 fulfilling the following two conditions: first, the highest level of education training attained is ISCED 0, 1, 2 or 3c short, second respondents declared not having received any education or training in the four weeks preceding the survey (numerator). The denominator consists of the total population of the same age group, excluding no answers to the questions "highest level of education or training attained" and "participation to education and training".

Data for RS, AL, and MK are shown at country level.  
 \*Data for AL are for 2009

### *9.2.2.2. Population Aged 30-34 with a Tertiary Education*

#### Potentials

- The Atlantic Axis (except Portugal), the Northern Periphery and the Baltic Sea Region (with the exception of some Danish, Polish and German regions) keep levels of tertiary education above 40%.
- The Northern regions of Spain maintain a high percentage of population aged 30-34 with a tertiary education, in contrast to the high school dropout levels recorded.
- The cities register better values than the rural spaces.
- The peripheral regions of the north of Europe exceed the target established by the EU2020S, in contrast to their homonymous areas in the south.

#### Challenges

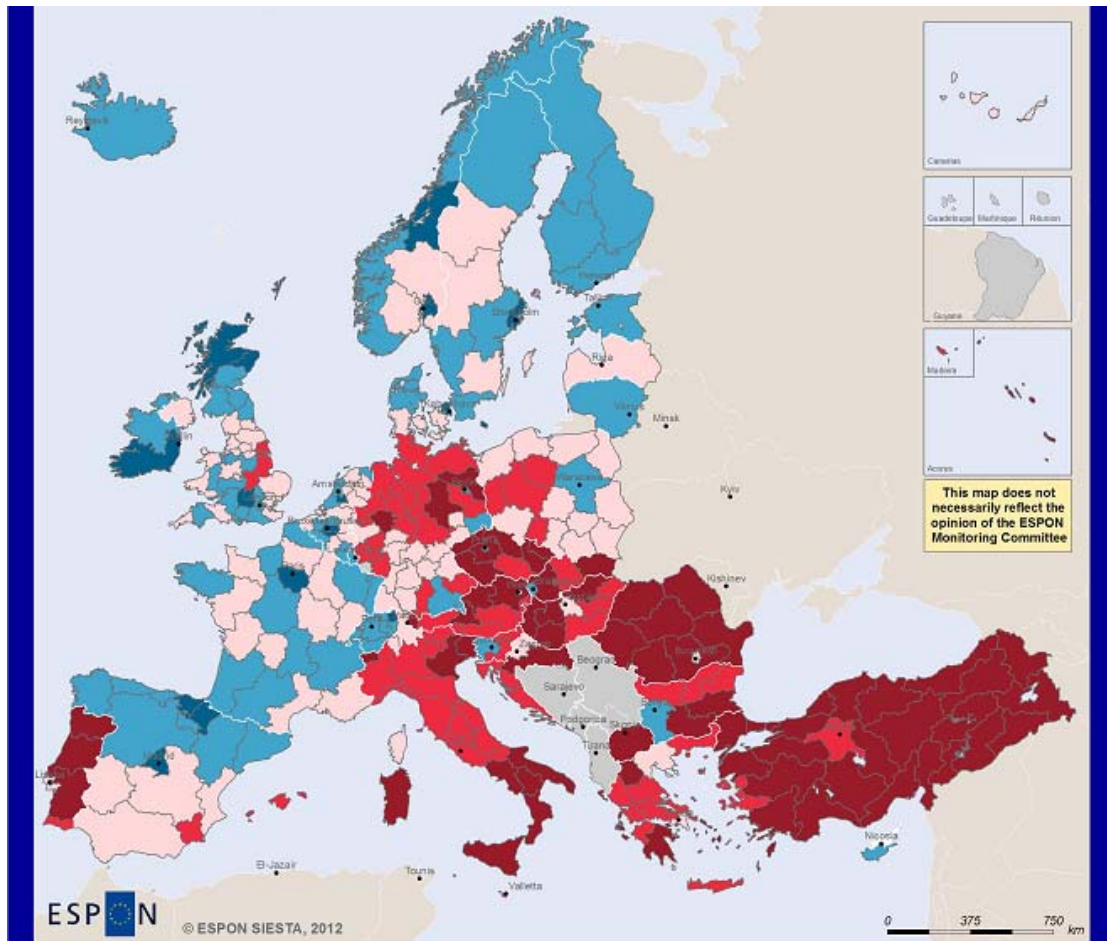
- All regions in the Mediterranean Basin, with the exception of Catalonia and Cyprus, are below the values recommended by the EU2020. Eastern Europe and Turkey have the worst rates of university population in Europe.
- With the exception of Bavaria, all regions of Germany and Austria are well away from the objectives of the EU2020S, especially the Austrian regions (23.5) and all of Northern Germany. In these regions, vocational training represents a valid alternative to university studies, and this could explain the rates of the "relatively low" student population, aged 30-34.
- All Italian regions, including the north, have very low figures on population aged 30-34 with university education (19.8). Italy occupies the last position of the EU-27 and just ahead of Turkey (15.5) by just over four percentage points. This deficit in higher education could have a negative impact on the country's economic development in the medium term.
- Northern regions of Spain are above the EU2020S objectives for the population aged 30-34 with a university degree, especially the Community of Madrid, the Basque Country and Navarre. However, these same regions have high youth unemployment, especially coinciding with the onset of the economic crisis, which could respond to a major disconnection between universities and the job market demands.



## Opportunities

- The Bologna Process facilitates the mobility of teachers, researchers and students in order to improve and exchange knowledge across Europe.
- E-learning constitutes a possible solution for students living in the rural, mountainous, sparsely populated and outermost regions.
- To increase scholarships and grants directed towards covering the enrolment of low-income families, and even in situations of relative poverty.
- To reinforce the role of the University and public education as guarantor of universal tertiary education.
- To adapt the university programs to the needs of the labour market. The pupils need to see that real professional opportunities exist.
- To annually visit the centres of secondary education to inform about the functioning of the university, the contents of the degrees and their corresponding professional opportunities.
- To develop campaigns of "The open university" through which the pupils and the population in general could visit the buildings of the university, see how they work, the services that they have, to get to know university life, etc. An activity in which teachers, pupils, student associations, parents, professional schools, successful companies, etc. will be able to collaborate
- To make use of the advantage that the Tics offer to complete the curriculum with matters of free electives that are given in other universities and in other languages.
- To increase the university - company collaboration agreements for the achievement of internships, either in the actual country or in any other in the EU.
- To avoid the brain drain:
  - o The University must talk with the companies to plan what the real needs are on the subject of human resources training.
  - o The University must invest in the consolidation of the highly qualified researchers

**Map 24 Population Aged 30-34 with a Tertiary Education, 2010**



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Regional level: NUTS2  
Source: Seventh Report on Economic, Social and Territorial Cohesion  
Origin of data: EUROSTAT, 2011  
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**Percentage of total population aged 30-34 (%) 2010.**  
**EU 2020 Target = 40%**



**Notes:**  
The share of the population aged 30 - 34 years who have successfully completed university or university-like (tertiary level) education with an education level ISCED 1997 (International Standard Classification of Education) of 5-8. This indicator measures the Europe 2020 strategy's headline target to increase the share of the 30 - 34 years old having completed tertiary or equivalent education to at least 40% in 2020.

### 9.2.3. Digital Society

#### Main ideas

- Europe is progressing at different rates in the Information Society. It is possible to appreciate a Digital Divide between Central Europe and the Scandinavian Region compared with the rest of the European regions. The European Eastern regions show the worst situation [See Map 25: Individuals who have never used a computer, 2011].
- The Digital Agenda for Europe proposes the creation of a single digital market based on fast internet access and advanced services. The main aim by 2013 is broadband access for all, but in 2010 only 61% of households accessed the Internet via broadband [See Map 26: Broadband penetration rate 2006-2009].
- According to the Digital Agenda for Europe, the percentage of the population buying online should surpass 50% but in 2010 only 37% of individuals aged 16-74 bought online. E-commerce, such as advanced Internet services to purchase goods and services, is only widespread in advanced regions of Europe [See Map 27: E-Commerce: Individuals who ordered goods or services over the Internet for private use, 2010].
- The most advanced regions in the Information Society are also those that have better rates of GDP per capita and employment [See Maps 25 to 28 and 34].
- Rural areas in Scandinavia are a model to follow in the Information Society, breaking the paradigm of the Digital Divide in rural areas.
- The competitiveness of European regions would definitively require their integration into the Information Society.

#### Potentials

- Most European populations using the computer are also those that benefit most from the penetration of broadband and the use of advanced services over the Internet. Particularly notable are the regions of France, Benelux, Germany, The United Kingdom, Denmark, Norway, Sweden and Finland.
- The Scandinavian peripheral regions use ICT as strategic tools to overcome their geographical distance to Central Europe.
- The Scandinavian regions show that developing the Information Society in rural areas is possible.

## Challenges

- The rural, mountainous, sparsely populated and/or peripheral regions usually occupy lowly positions in the Information Society as part of the phenomenon known as the Digital Divide. This geographic and technological isolation limits the competitiveness of these regions.
- Technical limitations to overcome the technological processes of the past, hindering the diffusion of ICT in certain regions, especially in Turkey.
- The regions of Eastern Europe remain in positions far away from the Information Society. The Mediterranean regions also occupy positions lagging behind Central and Northern Europe.
- Breaking the Digital Divide is a challenge for Europe.

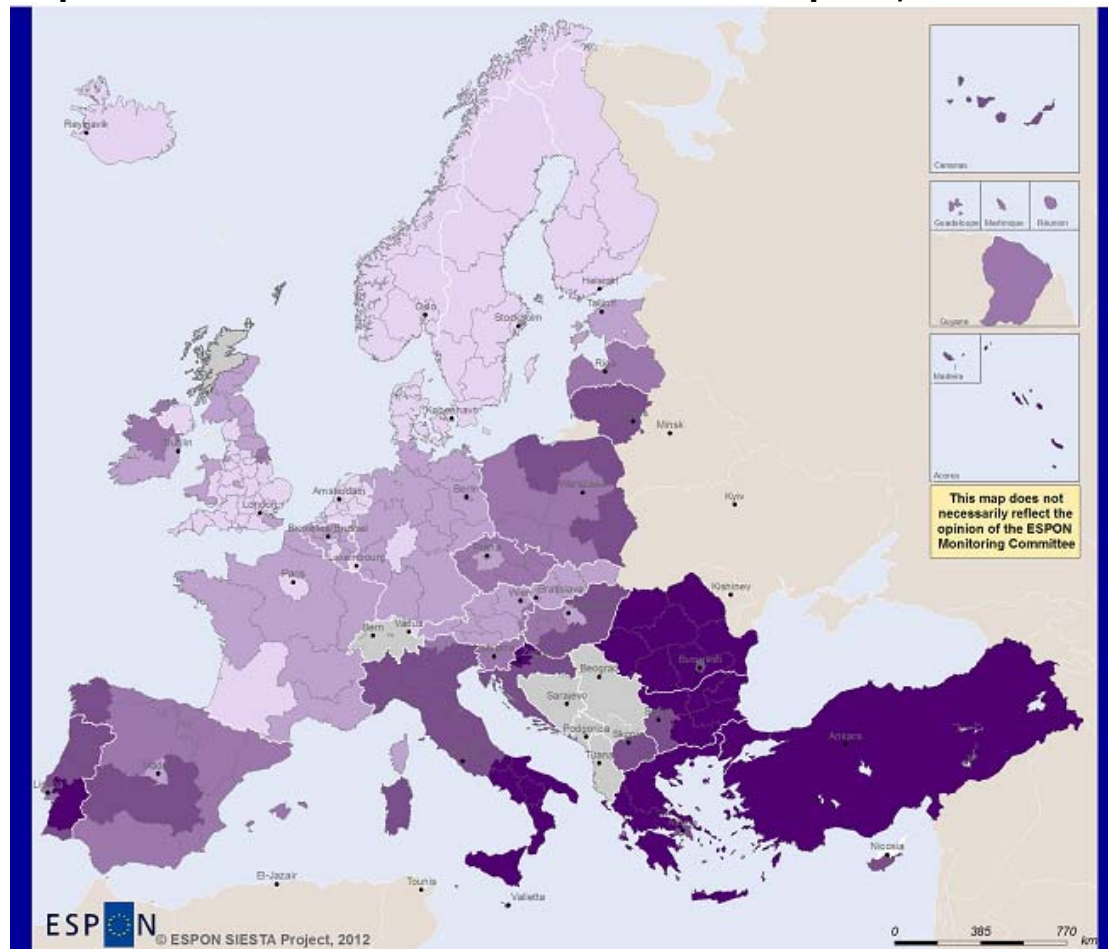
## Opportunities and policy recommendations

- In the Information Society there is a group of people who are not using ICT despite the availability of appropriate technical means to do so (this is the difference between real and potential users). This situation exacerbates the Digital Divide.
- Promotion of the use of ICT among the population requires advance planning, linked to the achievement of objectives in a reasonable time.
- In many regions, the probability of having never used a computer decreases with the levels of educational attainment. Planning the use of ICT in education can be an opportunity for the Information Society in Europe.
- Appropriate policies for the Information Society should influence training (digital literacy and skills) and public awareness in the use of ICT. The projection is that as the older generations pass away, "digital illiteracy" will become scarcer in Europe but, having said that, the education of digitally illiterate people is recommend.
- E-learning represents a new way of understanding education in rural, mountainous, sparsely populated and outermost regions of Europe.
- New technologies have the potential of increasing labour productivity and are strategic in R&D policy. More investment in ICT related R&D is required by the sector.
- New technologies reduce costs and save time for the public administration, citizens (e-government, online healthcare services and Teleworking) and businesses (e-commerce).
- There is an opportunity to overcome the uneven digital market of the European Union. Enterprises have the possibility of purchasing and

selling electronically, but it is important to overcome the risk of low trust in networks in order to achieve a truly digital market.

- New technologies promote environmental sustainability through Teleworking diffusion (reduced commuter movement) and the construction of intelligent buildings that save energy and reduce the Greenhouse Gas Emissions.
- European integration and territorial cohesion will be beneficial if ICT spread is facilitated. This phenomenon requires public and private infrastructures, training and skills in ICT, low internet access prices and policies to promote the online interactive services. The rural regions of Scandinavia could be the reference for Europe.

## Map 25 Individuals who Have Never Used a Computer, 2011

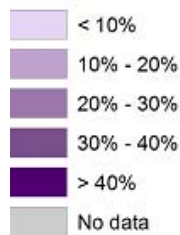


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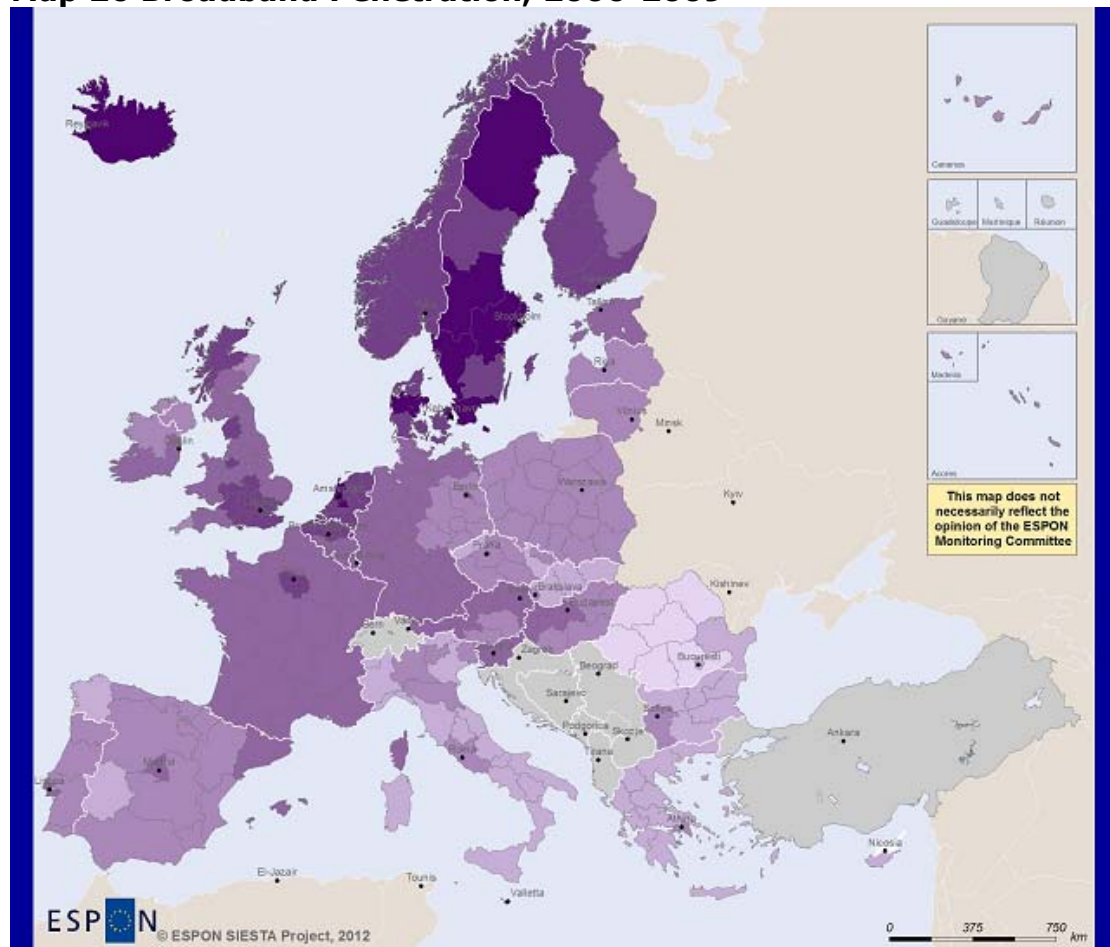
Regional level: NUTS2, NUTS1 and NUTS0  
Source: Eurostat  
Origin of data: EUROSTAT, 2012  
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### % individuals who have never used a computer, 2011.



Notes:  
IE, UK, SE, FI, NO, EE, LV, LT, BE, NL,  
PT, ES, CZ, AT, HU, HR, PL, RO are shown at NUTS2 level.  
FR, DE and EL are shown at NUTS1 level.  
IS, MK, SI and TR are shown at country level.  
BO, HR, TR, MK, DK, NL, SE, UK, ES63 are shown for 2010.  
BG is shown for 2007.

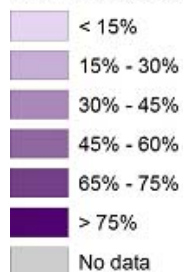
**Map 26 Broadband Penetration, 2006-2009**



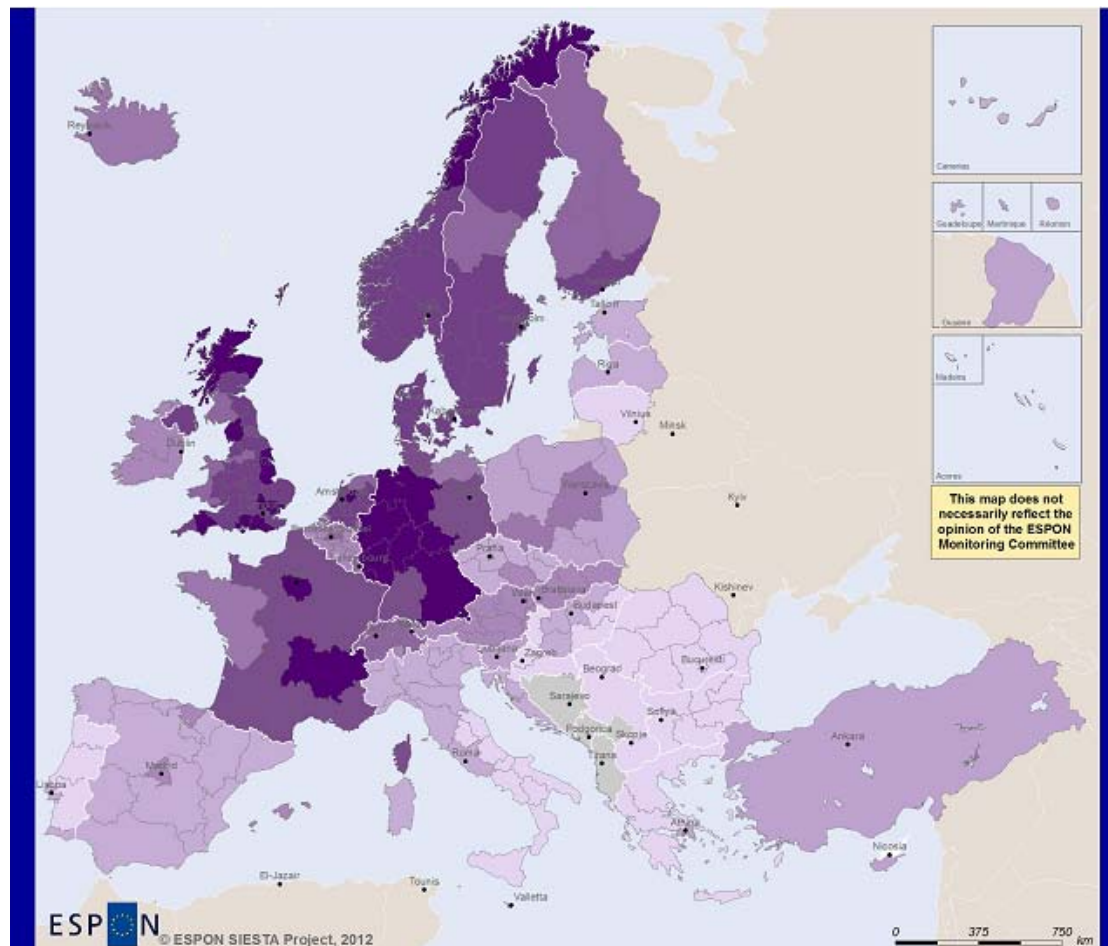

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Regional level: NUTS2  
 Source: KIT-ESPON Project  
 Origin of data: EUROSTAT  
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**% of households, 2006 - 2009.**



**Map 27 E-commerce: Individuals who Ordered Goods or Services over the Internet for Private Use, 2010**

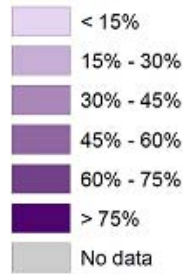


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Regional level: NUTS2, NUTS1 and NUTS0  
 Source: Eurostat  
 Origin of data: EUROSTAT, 2012  
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**% of individuals aged 16 to 74, 2010.**



Notes:  
 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: <http://www.bfs.admin.ch/bfs/portal/en/index.html>  
 Data for BH11, BG12, BG13, BG21, BG22, BG23 and FI2 are not available for 2010.  
 These regions are shown for 2007.  
 TR data corresponds to 2011.  
 UKE1 data are not available for 2010 and are shown for 2009.



## 9.3. Sustainable Growth

### 9.3.1. Competitiveness and Economic Growth

#### Main ideas

- In terms of GDP per capita, there is a large contrast between the regions of Western Europe and Scandinavia and the Eastern Europe ones [See Map 28: GDP per capita, 2009].
- The regions with high levels of GDP are regions with a higher degree of labour productivity [See Map 28 and 29: Labour productivity, 2008].

#### Potentials

- The "Blue Banana" is appreciated as the macro-region with the best levels of GDP per capita in Europe. This macro-region starts in the Greater London and finishes in Northern Italy via Benelux, Western and Southern Germany, Switzerland and Western Austria. It is possible to observe some regions with high levels of GDP near the "Blue Banana" such as Scotland, Ireland, part of the Paris Basin and the North Western Spain which is close to the Rhone Valley. The Scandinavian regions complete the best regions of Europe in relation to GDP per capita.
- Usually, the metropolitan regions have the highest GDP per capita, but the Scandinavian rural regions reach high values as well.
- At the same time, it is possible to appreciate clear differences between the levels of GDP reached in the different cities. For instance, the cities stronger in GDP per capita are not necessarily the capital ones. This circumstance favours a polycentric territorial model.
- During the period 2007-2011, the highest GDP growth coincides with the Eastern European regions which started to improve from low levels.
- Scandinavian and Eastern countries have the lowest GDP debt of Europe, but during the period 2007-2011 only Sweden and Bulgaria have reduced the debt.

## Challenges

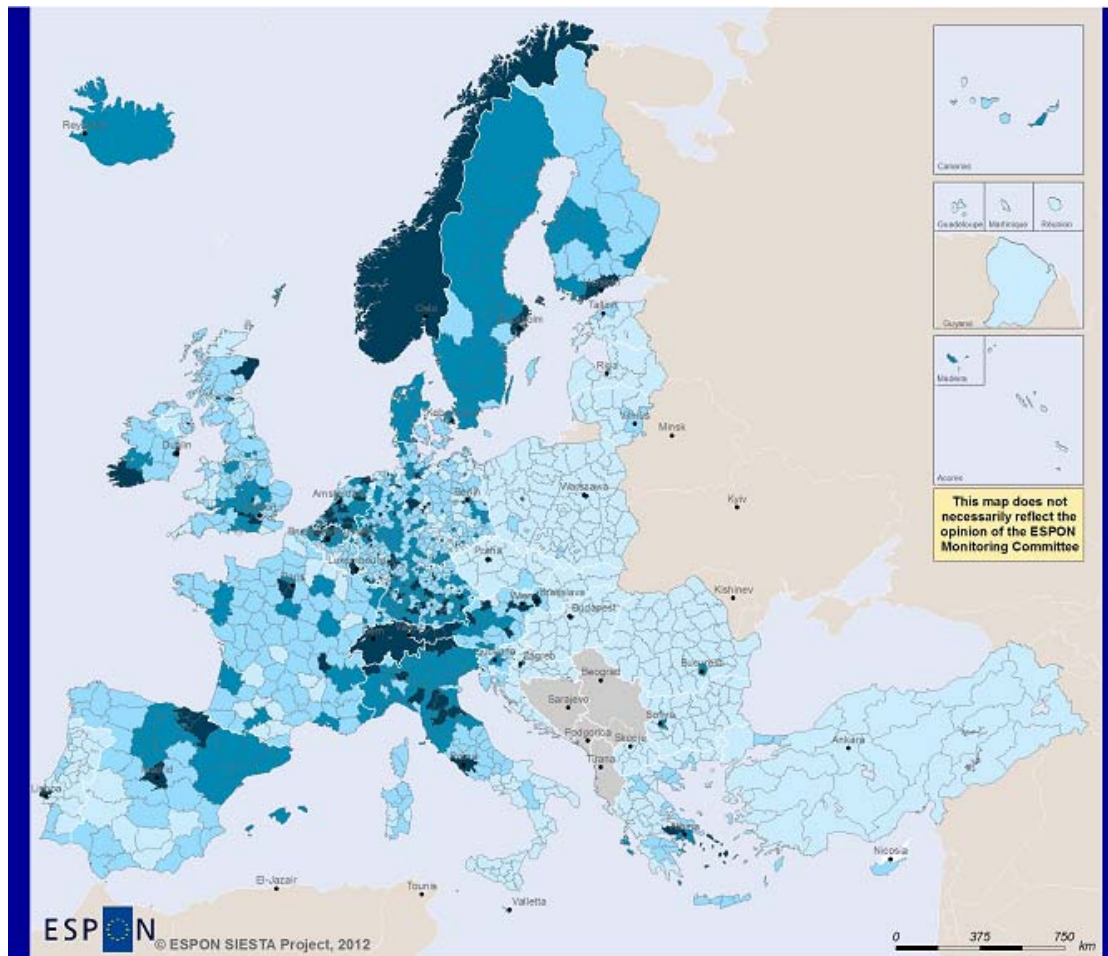
- During the period 2007-2011, the lowest GDP growth was focused on most regions of Iceland, Ireland, Portugal, Spain, Italy, Croatia, Slovenia and Greece. Solutions to get out of the current crisis are urgent in Europe.
- The regions from Eastern Europe which have low levels of GDP per capita are suffering the consequences derived from the "Iron Curtain" period.
- Curiously, the most economically developed countries register the highest levels of debt.

## Opportunities

- The Scandinavian rural regions represent models of good practices. These regions have high levels of GDP per capita and are an example of progress, breaking the perception that "rural areas are poorer than urban ones".
- To increase the competitiveness of the European regions is key for growth. Europe needs major investment in R&D and needs to reinforce human resources training in science and technology.
- There is an opportunity for those regions which invest in R&D in order to increase the production of patents and their attractiveness for transnational corporations. These policies or activities increase the rates of employment and the GDP per capita.
- Europe needs to be competitive to consolidate its presence in the emerging markets and not to brake economic growth.
- There is a possibility to plan an urban polycentric model as European authorities advised, taking into account the mid-sized cities. Maybe, this action requires a review of the models of governance (complementarily, cooperation and territorial cohesion).
- Reviewing the financial and fiscal system signifies a real need in the current crisis. At the same time, a balance between public revenues and public spending is clearly a need also.
- The continuous adjustment policies brake consumption and, consequently, the growth of the European regions. Europe needs to reduce its public debt through alternative policies that encourage employment and do not reduce social security benefits.
- To implement employment policies is the key to overcoming the crisis. The revenue level increases and consumption is reactivated.
- To minimize the risk of managerial relocation with fiscal incentives, programs of continuous training for workers, qualified labour, help for market research, creation of R&D departments, etc.

- Politics of territorial marketing capable of attracting foreign investors. The key elements of this are based on a competitive society, qualified human resources, labor productivity, R&D, technologies, fiscal incentives, infrastructures of communication, among others. Finally, it is necessary to recover the image of the brand of Europe as a secure territory for investment.

**Map 28 GDP per Capita, 2009**

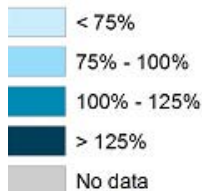


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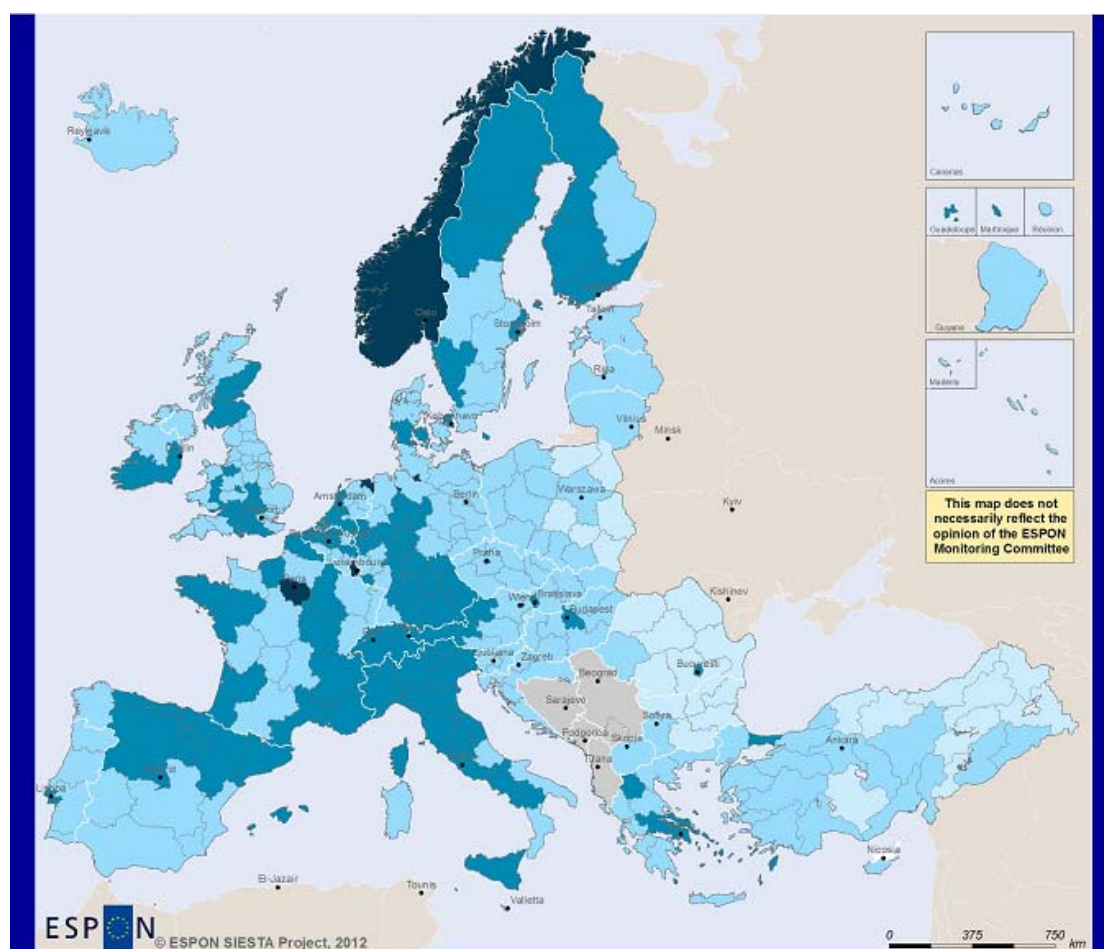
Regional level: NUTS3, NUTS2, NUTS0  
Source: EUROSTAT  
Origin of data: EUROSTAT, 2011  
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**PPS per inhabitant in % of EU average (EU=100) at current market prices, 2009.**



Notes:  
Data for ES and TR are shown for 2008.  
TR is shown at NUTS2 level.  
IS, NO and CH are shown at country level.

**Map 29 Labour productivity, 2008**

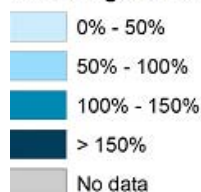


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Regional level: NUTS2, NUTS0  
Source: EUROSTAT  
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Percentage of EU27 average (%), 2008.



Notes:  
Labour productivity per person employed was calculated as the ratio of the regional GDP in millions of PPS between the total number of employees.

### 9.3.2. Green Economy, Climate Change and Energy

Main ideas

- Among the targets of EU2020S are reducing by 20% the emission of greenhouse gases, increasing by 20% the share of renewable energy, and trying to get a 20% increase in energy efficiency.
- Some progress is observed in Europe since early 1990 in relation to GHG because these have been reduced by 10% despite the economy growing by 40% [See map 30: Greenhouse Gas Emissions, 2009].

- It is estimated that by 2030, 80% of the population will reside in cities, a fact to which special attention must be paid in that 75% of total CO<sub>2</sub> emissions are produced in them.
- At present, the production of renewable energy is not consolidated in Europe. Most of the European regions do not reach the target proposed by the EU2020S [See map 31: Share of renewable energy in gross energy consumption, 2009].
- The European regions meet beforehand the conditions necessary for the production of renewable energies. The potential of the Northern regions for the generation of wind power, and that of the southerners for solar stands out [See Map 33: Potential for electricity production from PV panels, 2005].

### Potentials

- The regions with a better situation in terms of GHG emissions are in Germany, Austria, Slovenia and Croatia. The Baltic republics of Estonia, Latvia and Lithuania are notable for their lower level of emissions. There is a second area of significant improvement in the emission of gases that begins in UK and ends in the Black Sea, including Germany, Czech Republic, Slovakia, Hungary, Romania and Bulgaria.
- Regions that are best in the percentage of renewable energy production are the Scandinavian countries, especially Norway and Sweden. Also noteworthy is the central and northern part of the Baltic region, where Finland, Estonia and Latvia maintained a high percentage of renewable energy. In the rest of Europe only Portugal, Austria and Romania meet the objectives of the EU2020S.

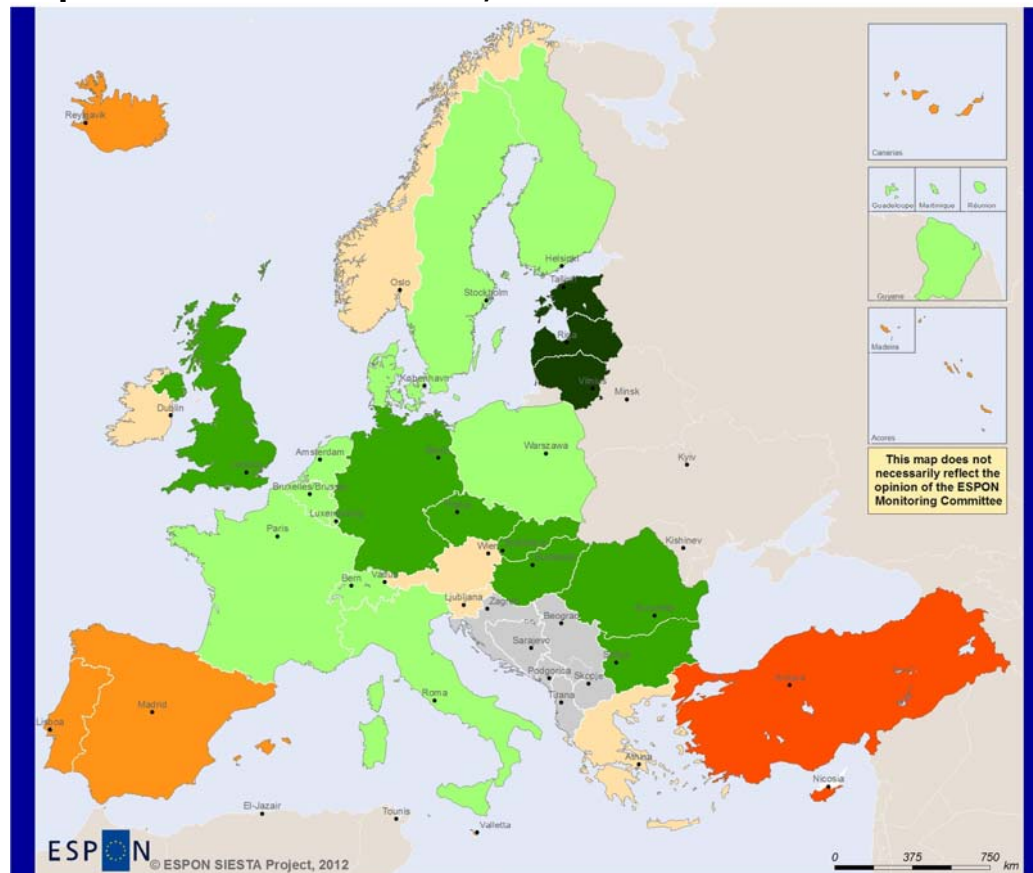
### Challenges

- The spaces are those which register a better grade of emission of GHG. Nevertheless, the rural regions of Poland, Czech Republic and Slovakia are very contaminated.
- All Turkish regions reach very high pollution levels. Another great pole to highlight are the British Isles, with the exception of Wales and Scotland.
- British Isles and Benelux present the worst percentages of the continent in renewable energy (5 %). Germany, Poland, Czech Republic, Hungary and Italy also maintain very low values in production of renewable energy.

## Opportunities

- Strategies for achieving sustainable development and to manage to reduce the gas emission, especially in the urban spaces, require:
  - o New mobility policies (carpool to work, parking on the outskirts of the city, forbidden access days depending on enrolment, improving public transport, promote cleaner models of public transport, etc.).
  - o Improve the buildings' energy performance.
  - o More sustainable urban planning and citizen participation (local milieu) to obtain "Liveable Communities".
- Europe needs to commit to the production of renewable energy since it has potential to produce wind and solar power. In relation to the wind energy the areas with the greatest potential are found in the Baltic Sea Region, Northern Ireland and Scotland. Regarding the implementation of photovoltaic panels the best regions are in the Mediterranean Basin.
- Promote energy efficiency through:
  - o Awareness Campaigns on energy efficiency directed at the population in general.
  - o Chats and school conferences on the intelligent use of the energy in homes and in the actual educational centers.
  - o Energy Saving in the state buildings and replacement of the classic system of illumination with LED technology.
  - o Incentives for the companies for energy saving and the optimization of facilities (automated buildings and LED systems of illumination).
  - o Policies for the creation of R&D departments focused on production and energy saving, especially in the big managerial groups.

## Map 30 Green Gas Emissions, 2009



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Regional level: NUTS0  
 Source: EEA  
 Origin of data: EEA, 2011  
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**Notes:**

The aggregated greenhouse gas emissions are expressed in units of CO<sub>2</sub> equivalents.

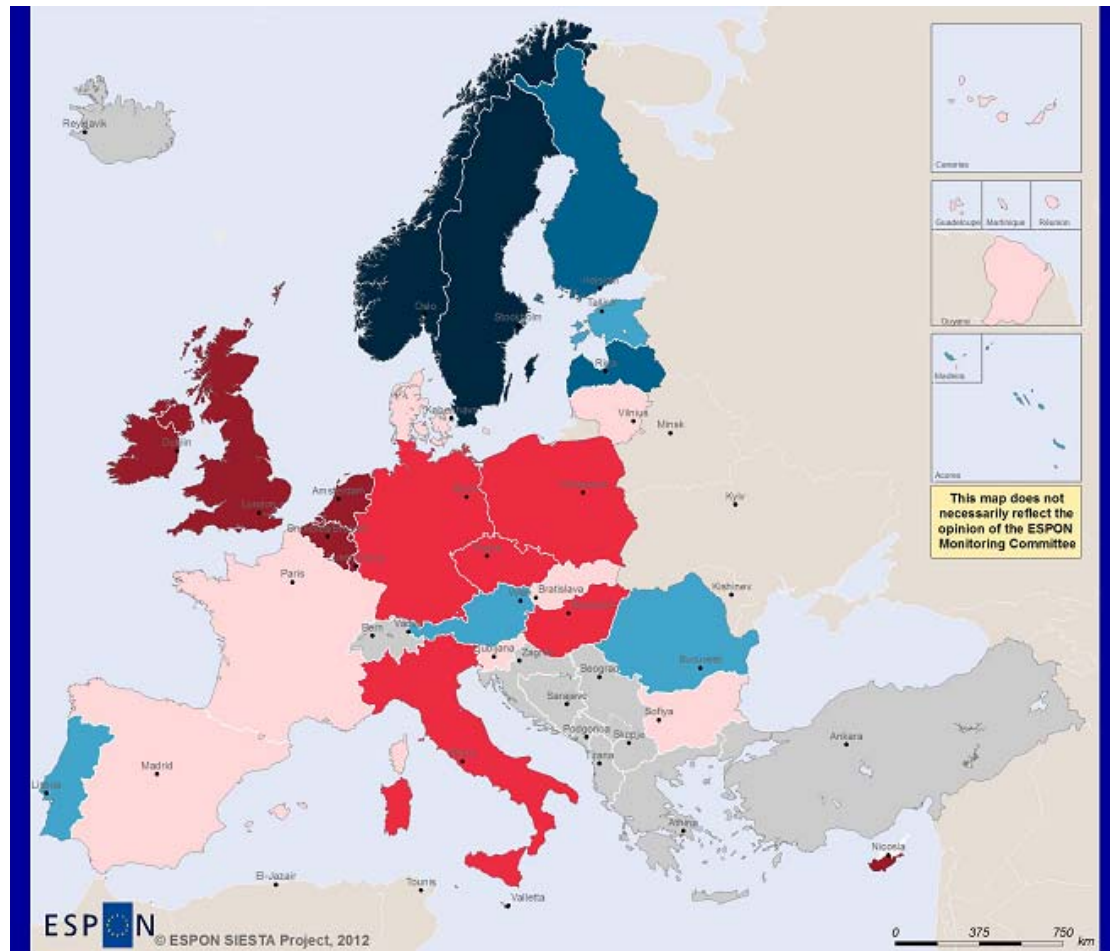
The indicator does not include emissions and removals related to land use, land use change and forestry (LULUCF); it does not include emissions from international aviation and international maritime transport. CO<sub>2</sub> emissions from biomass with energy recovery are reported as a Memorandum item according to UNFCCC Guidelines and not included in national GHG totals.

The EU as a whole is committed to achieving at least a 20% reduction of its greenhouse gas emissions by 2020 compared to 1990. This objective implies:

- Reduction of 21% in emissions from sectors covered by the EU ETS (emissions trading scheme) compared to 2005 by 2020;
- Reduction of 10% in emissions for sectors outside the EU ETS.

To achieve this 10% overall target each Member State has agreed country-specific greenhouse gas emissions limits for 2020 compared to 2005 (Council Decision 2009/406/EC).

# Map 31 Share of Renewable Energy in Gross Final Energy Consumption, 2009



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Regional level: NUTS0  
Source: EUROSTAT  
Origin of data: EUROSTAT, 2011  
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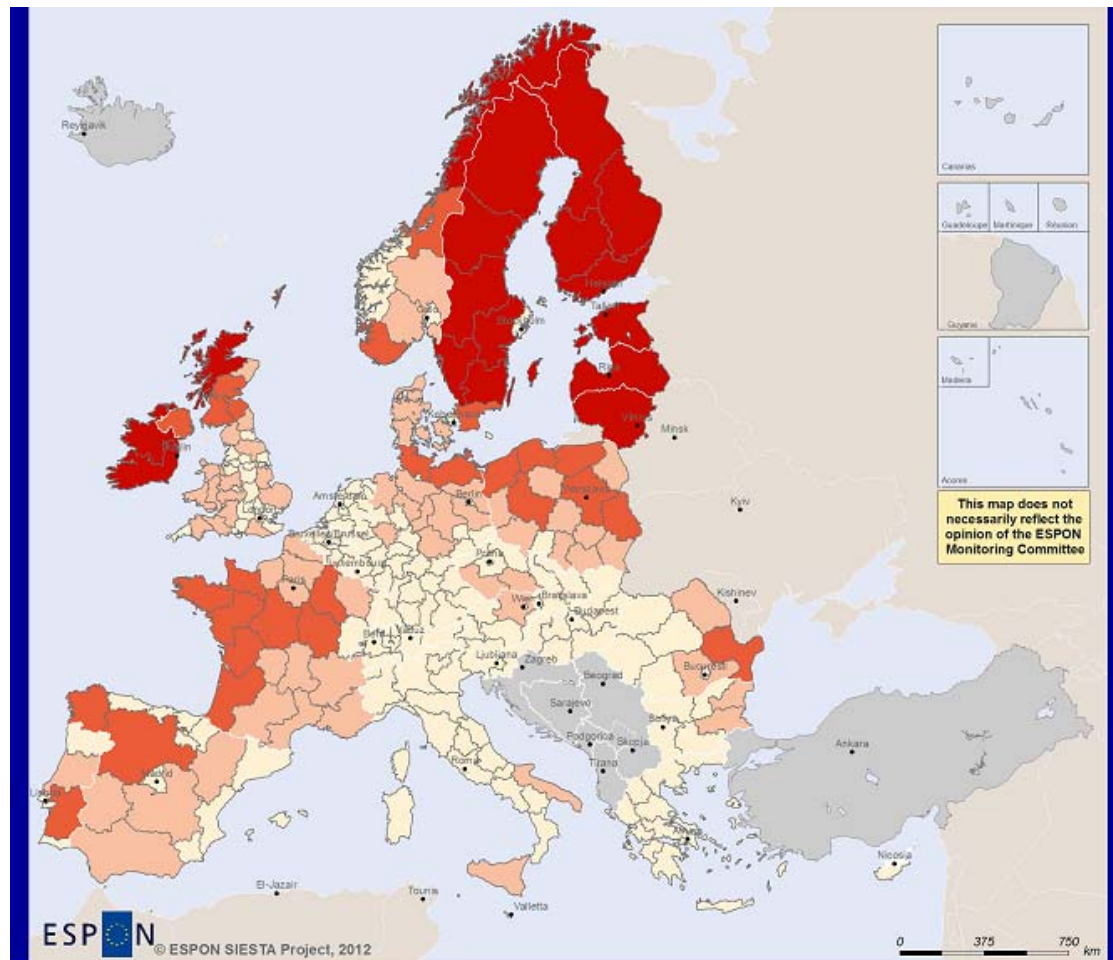
## Percentage of gross final energy consumption (%), 2009. EU 2020 Target = 20%

Below EU Target	Above EU Target
<span style="display:inline-block; width:15px; height:15px; background-color:darkred; border:1px solid black;"></span> < 5%	<span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> 20% - 30%
<span style="display:inline-block; width:15px; height:15px; background-color:red; border:1px solid black;"></span> 5% - 10%	<span style="display:inline-block; width:15px; height:15px; background-color:darkblue; border:1px solid black;"></span> 30% - 40%
<span style="display:inline-block; width:15px; height:15px; background-color:pink; border:1px solid black;"></span> 10% - 20%	<span style="display:inline-block; width:15px; height:15px; background-color:darkblue; border:1px solid black;"></span> > 40%
<span style="display:inline-block; width:15px; height:15px; background-color:grey; border:1px solid black;"></span> No data	

Notes:  
This indicator is calculated on the basis of energy statistics covered by the Energy Statistics Regulation. It may be considered an estimate of the indicator described in Directive 2009/28/EC, as the statistical system for some renewable energy technologies is not yet fully developed to meet the requirements of this Directive. However, the contribution of these technologies is rather marginal for the time being. More information about the renewable energy shares calculation methodology and Eurostat's annual energy statistics can be found in the Renewable Energy Directive 2009/28/EC, the Energy Statistics Regulation 1089/2008 and in DG ENERGY transparency platform [http://ec.europa.eu/energy/renewables/index\\_en.htm](http://ec.europa.eu/energy/renewables/index_en.htm).



## Map 32 Potential for Electricity Production from Wind Power Stations, 2005

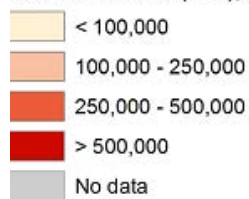


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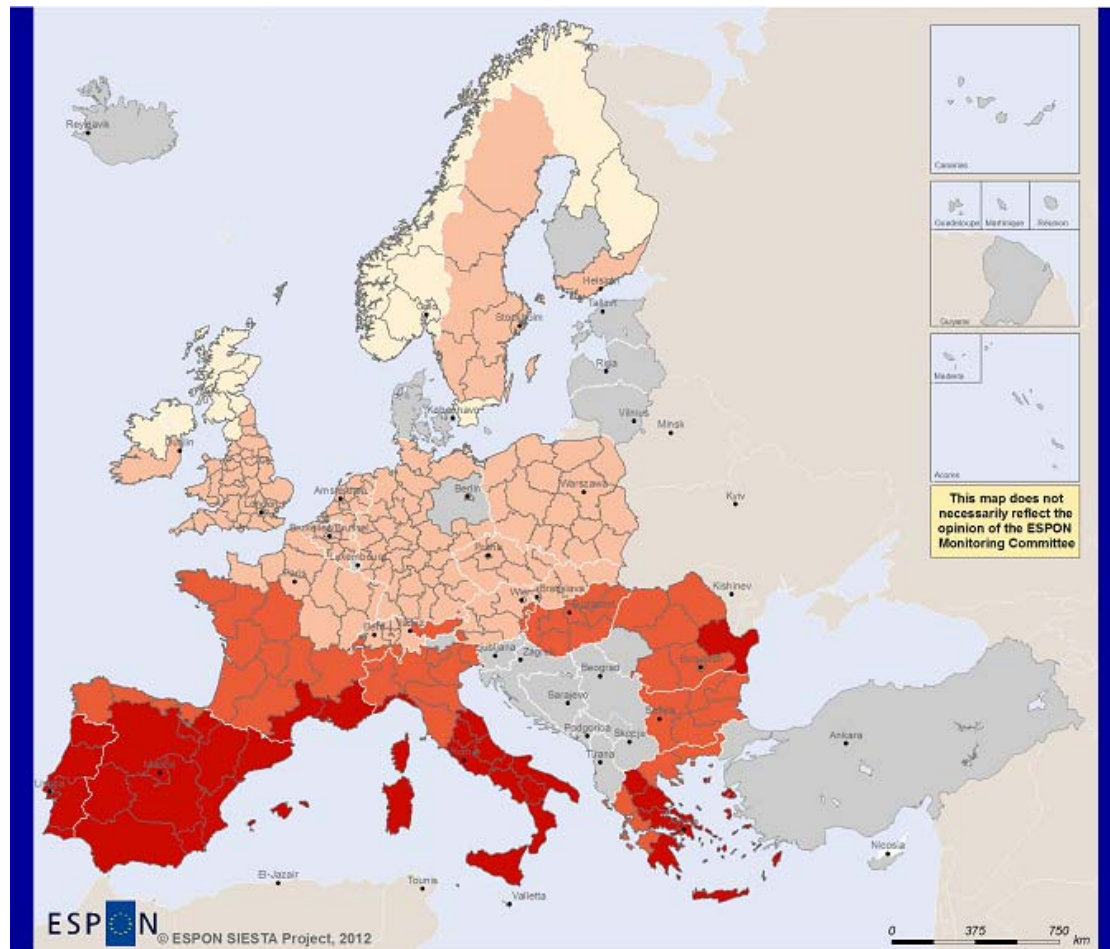
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Regional level: NUTS2  
Source: ESPON DATABASE  
Origin of data: ReRisk ESPON PROJECT  
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### Meters/ second (m/s), 2005.



**Map 33 Potential for Electricity Production from PV panels, 2005**

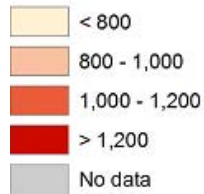


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Regional level: NUTS2  
Source: ESPON DATABASE  
Origin of data: JRC  
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**Potential production of electricity in kWh, 2005.**



Source:  
<http://re.jrc.ec.europa.eu/pvgis/apps/admonth.php>

## 9.4. Inclusive Growth

### 9.4.1. Employment, Skills and Jobs

#### Main ideas

- On the subject of Employment, Skills and Jobs the EU2020S proposes as a target to obtain 75 % of employment between the group of 20-64-year-old persons. The majority of the European regions do not comply with the said objective, except specific cases in Scandinavia, central Europe and Great Britain. [See Map 34: Employment rate, 2010].
- In 2011 the employment rates of Europe (68.6 %), were below the ones in the US (70.4 %) and Japan (74.9 %).
- In general terms, one can affirm that during the period 2000-2010 most of the European regions showed a positive tendency in the employment rates [See Map 35: Change in employment rate, 2000-2010]. Nevertheless, the crisis that since 2007 affects Europe is leaving its mark through a rapid decrease in this rate, which is translated as an increase of the rate of unemployment.
- Central and northern Europe stand out for the volume of persons used in the public sector, with values that top 25 % of the working population. Also they highlight the percentages registered in the most peripheral and island regions [See Map 36: People working in the public sector, 2010].
- The attainment of employment has direct bearing on the qualification grade. According to the Agenda for new skills and jobs, the labour insertion will be major as training is adapted to the real demands of the Labor market. In this sense, it will be necessary to pay special attention to the regions of Eastern Europe, where the education and training programs are not complying with the expectations of creation of short-term employment [See Map 37: Participation of adults in education and training, 2010].

#### Potentials

- Central and Northern Europe maintain the largest job boards, except in three specific regions that are located in the Northwest of Ireland, especially in the historical province of Connacht, the French region of Languedoc and the Corridor Lille-Charleori on the Franco-Belgian border.
- Except specific exceptions, the regions of the central and Eastern Europe register a tendency positive tendency in creation of employment.

## Challenges

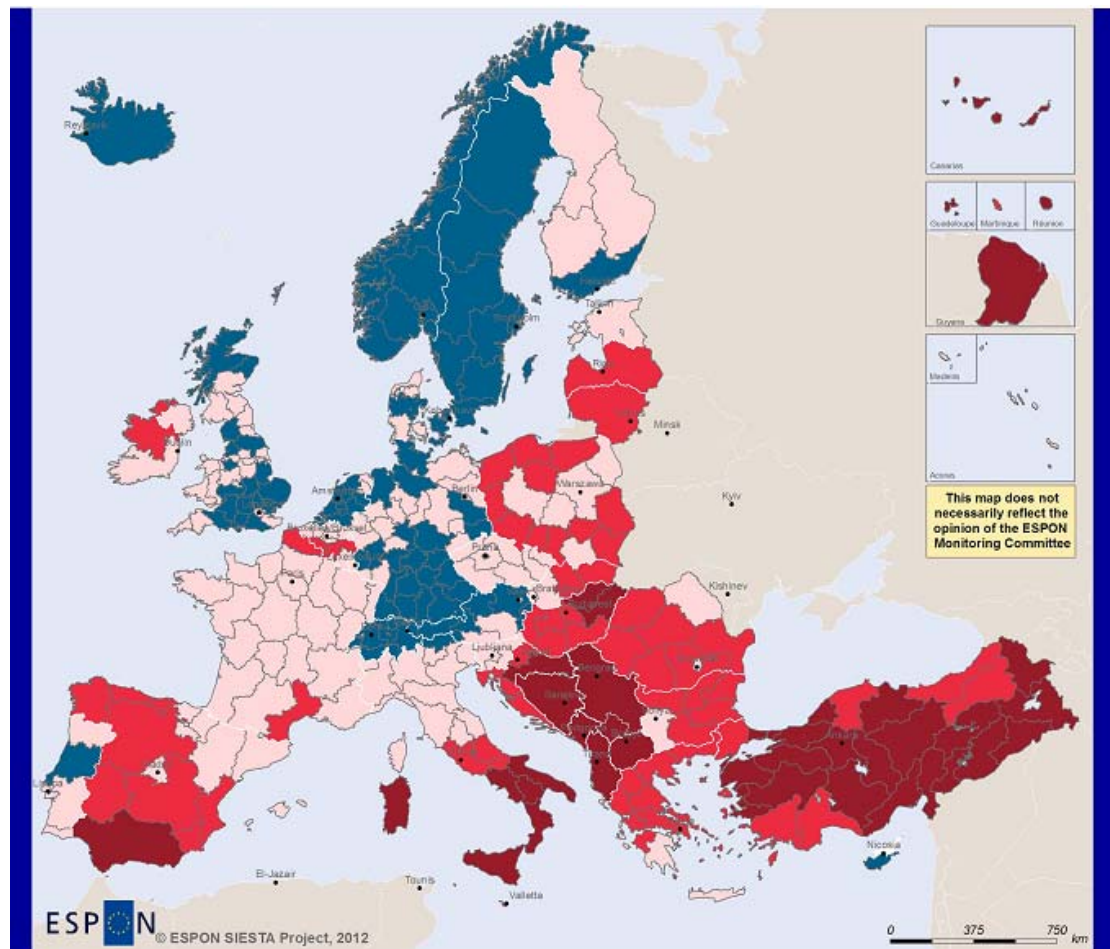
- The unemployment rates present higher values in Turkey, Eastern Europe and the Mediterranean Basin, with the exception of Catalonia, Balearic Islands, Costa Azul, Corsica, northern Italy, Slovenia, Athens, Crete and Cyprus.
- In Spain, Ireland, Iceland and the Baltic republics of Estonia, Latvia and Lithuania, all the administrative regions (NUT3) have lost a high percentage of employment in the period 2007-2009.
- In the Mediterranean Basin it is observed that at urban level (LIGHT) a major unemployment rate exists. The regions that to a great extent surpass the EU unemployment average (9,6 %) are those of Eastern Europe and oriental Mediterranean.
- At present, Spain and Greece are the countries most affected by unemployment, reaching rates that exceed 20 % .
- Some regions have a high level of youth unemployment, especially coinciding with the outset of the economic crisis, which could respond to the major disconnection between universities and job market demands.
- Although in Spain there is a high percentage of participation of adults in education and training registers, the levels of unemployment are still high.

## Opportunities

- Only the competitive regions are capable of generating employment. Consequently, it is necessary to commit to investment in R&D, constant training and the promotion of highly qualified human resources.
- To create job means to give support to the companies, as much to those of new creation (fiscal incentives, logistic support and of management, economic aid, complementary and free training for businessmen and workpeople), as to the already consolidated ones (progress of the training, help for hiring and research, to the production of patents).
- To avoid the risks derived from the processes of managerial delocalisation and the disloyal competition of foreign companies (for example, those that use dumping skills or similar).
- To look for commercial opportunities to place the excesses of stock of production on the market.

- To control and to regulate hidden employment in order to guarantee a few minimally demanded labour conditions, as well as to avoid the tax evasion derived from its practice.
- To bear in mind the current demands of the labour market; a more and more demanding market, which is based on the constant training and on the qualification of the workpeople. Consequently, the regions far from the targets EU2020S have to re (adapt) their policies on the subject of education and professional training.
- To promote the formation and/or training in those regions that has turned out to be affected by the economic crisis. Special attention will have to be paid to the groups with major problems of labour insertion (young people, women, long term unemployed).
- The regions bothered by processes of industrial restructuring should centre their efforts on forming and qualifying the workpeople in order to reinsert them into the labour market. These regions need to reinvent their economies based on new R&D initiatives.
- Professional training must place a value on those regions especially affected by a high degree of juvenile unemployment, as is the case of the Spaniards, Bosnians, Serbians and Macedonians.
- To implant policies that allow to combine the formation of the young people with the development of part-time work.
- To promote incentives and actions of awareness directed toward the businessmen in order to up encourage them to hire, especially those with major problems of labour insertion.
- To support the formative processes in the companies, in order to improve the qualification of the workpeople, in aspects related to the specialization of their profession, and in Tics or other matters.
- To support the creation of services of conciliation of the working day and the family life, especially in those countries where they are more deficient, in order to favour the employment of women and men with families (children, elderly in their care).
- The countries newly incorporated into the UE27 must make use of the opportunity to realize benchmarking as regards to the labour policies of the top regions in the creation of employment.

**Map 34 Employment Rate, 2010**



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

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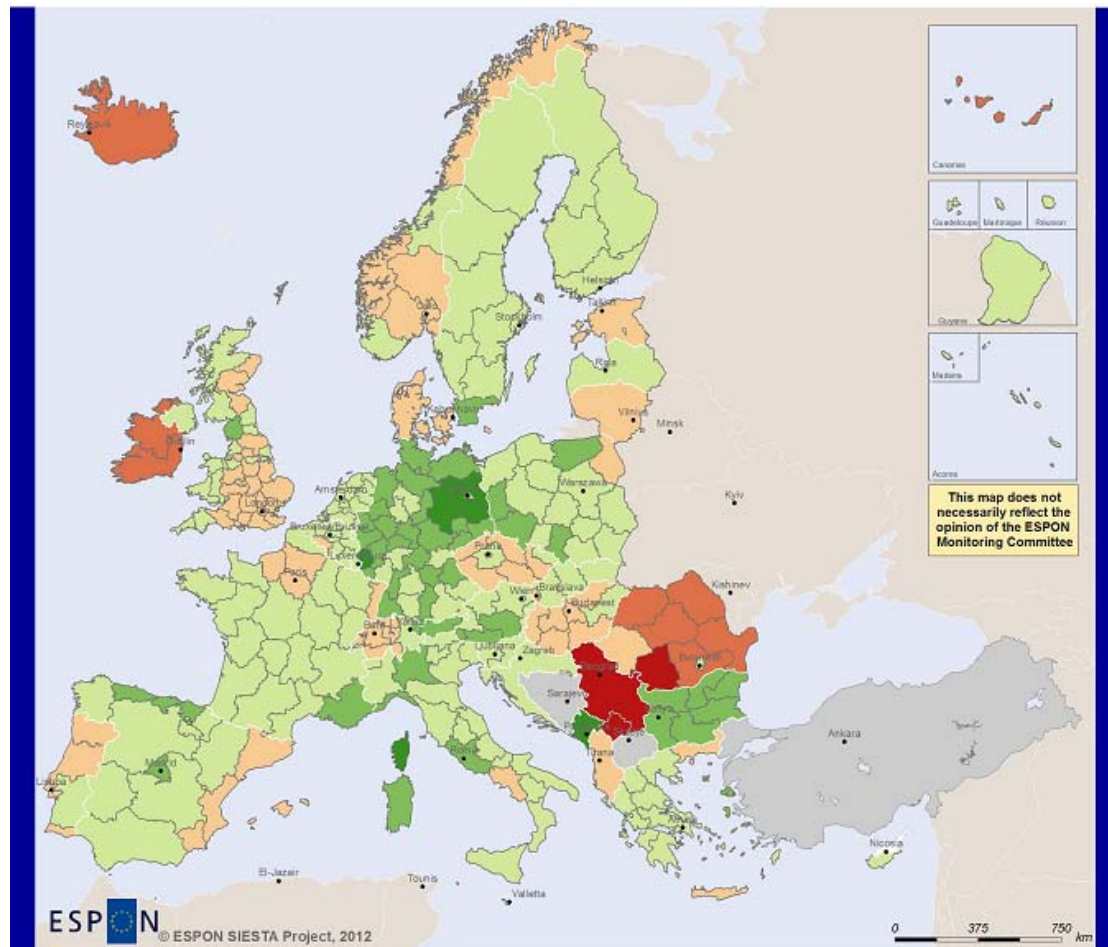
Regional level: NUTS2, NUTSO  
Source: EUROSTAT  
Origin of data: EUROSTAT, 2012  
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**Percentage of active population (%), 2010.**  
**EU 2020 Target = 75%**



Notes:  
The employment rate is defined as the number of persons aged 20 to 64 in employment by the total population of the same age group.  
The EU27 target is to reach a 75%.  
EU27= 68.5%  
Data for XK and AL are shown for 2009.

## Map 35 Change in Employment Rate, 2000-2010



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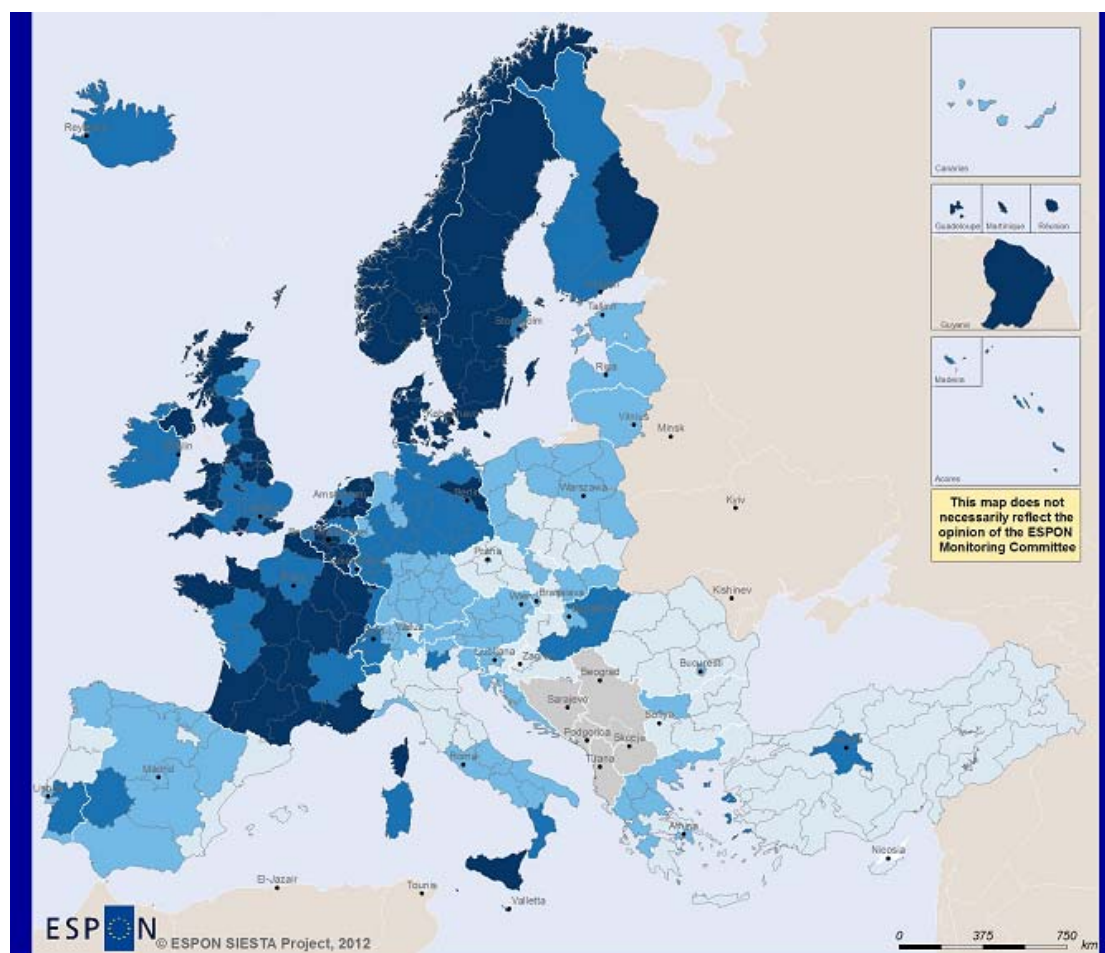
Regional level: NUTS3, NUTS2, NUTS0  
Source: EUROSTAT  
Origin of data: EUROSTAT, 2012  
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### Percentage points difference (%), from 2000 to 2010.



Notes:  
The employment rate is defined as the number of persons aged 20 to 64 in employment by the total population of the same age group.  
Data for BG correspond to 2003 - 2010 change.  
Data for DE41 and FE42 correspond to 2002 - 2010 change.  
Data for DEB1, DEB2 and DEB3 correspond to 1999 - 2010 change.  
Data for HR are shown at country level and correspond to 2002 - 2010 change.  
Data for XK correspond to 2001 - 2009 change.  
Data for ME correspond to 2001 - 2010 change.  
Data for AL correspond to 2000 - 2009 change.  
DK data are shown at country level.

**Map 36 People working in the public sector, 2010**



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Regional level: NUTS2  
Source: SIESTA Calculations using EUROSTAT NACE Rev.2 employment data  
Origin of data: EUROSTAT, 2012  
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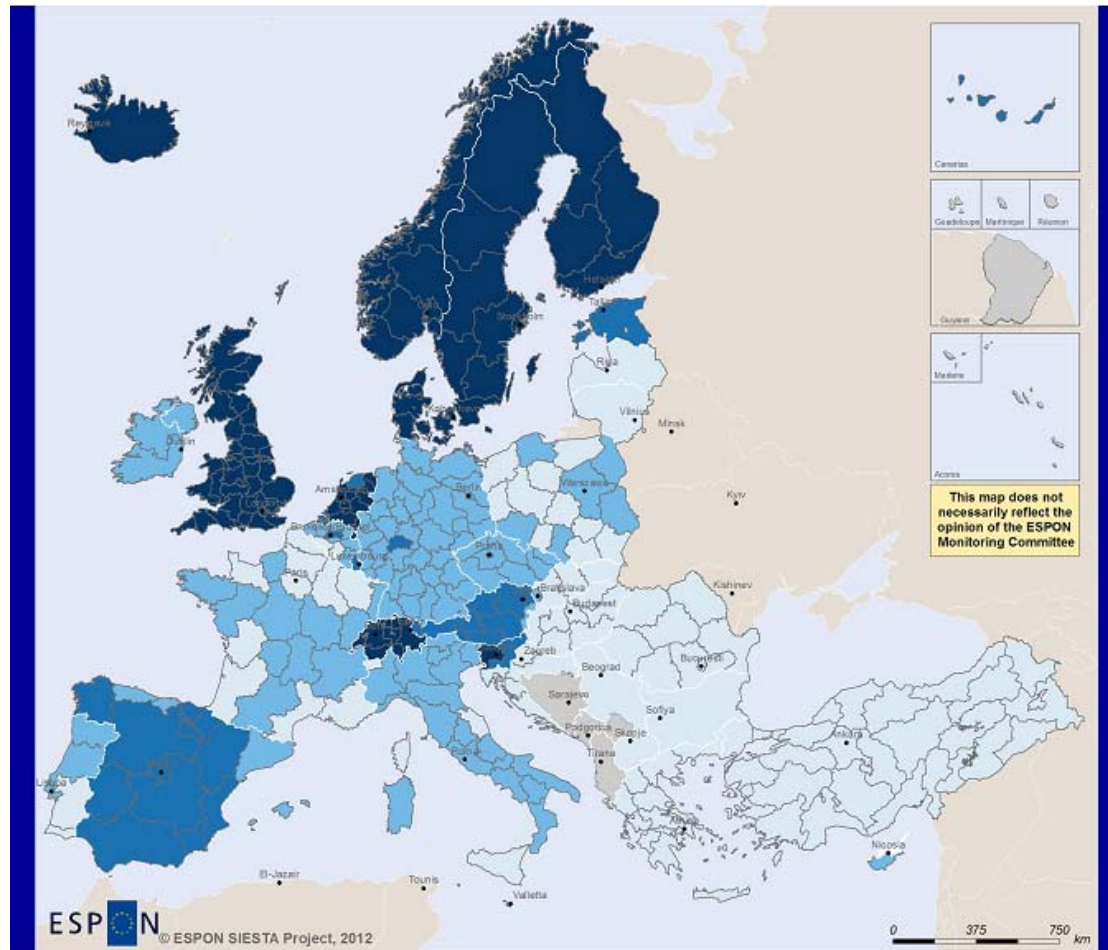
**% of total employment, 2010.**

- < 20%
- 20% - 25%
- 25% - 30%
- > 30%
- No data

Notes:  
Public sector is assimilated to NACE Rev. 2 codes O-Q:  
Public administration, defence, education, human health and social work activities.



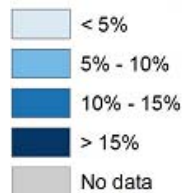
**Map 37 Participating of adults in education and training, 2010**



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Regional level: NUTS2, NUTS0  
 Source: EUROSTAT  
 Origin of data: EUROSTAT, 2012  
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**Percentage of population age 25-64 (%), 2010.**



Notes:  
 RS, BG, MK, CY, IS, EE, LV, LT, LU, MT are shown at country level.

## 9.4.2. Poverty and Exclusion

### Main ideas

- One of the targets of the EU2020S is to reduce in 20.000.000 the persons volume in risk of poverty and social exclusion.
- The peripheral regions of Europe, with the exception of the Scandinavia, are the ones that have a major percentage of persons in risk of poverty and social exclusion. The regions in Eastern Europe and the most southern of the Mediterranean slope especially stand out, which are far from complying with the target proposed by the EU2020S [See Map 38: Social Population at risk of poverty or exclusion, 2010].
- Although with social transfers, the regions with a major volume of person in a situation of poverty and social exclusion achieve certain progress, the poverty levels do not lessen sufficiently in order to be comparable to the rest of the regions [See Map 39: People at risk of poverty after social transfer, 2010].
- The persons with a major risk of poverty and social exclusion are the groups of with more difficulty for the labour insertion (young people, women, long term unemployed), and the elderly with little income. Nevertheless, it is observed that while social transfer and the welfare state continue, the most aged regions of Europe do not run the risk of seeing increased percentages of poverty and social exclusion [See Map 19 and Map 21: Ageing index, 2010].

### Potentials

- In Europe the population with less risk of falling into a situation of poverty or social exclusion is located in great part in the Scandinavian regions, Holland, the Genoa - Prague axis (North of Italy, east Switzerland, Austria, Czechia, Bratislava and a small enclave in the valley of the Rhone), as well as in the Spanish regions of Asturias, Basque Country, Navarre and Aragon.

### Challenges

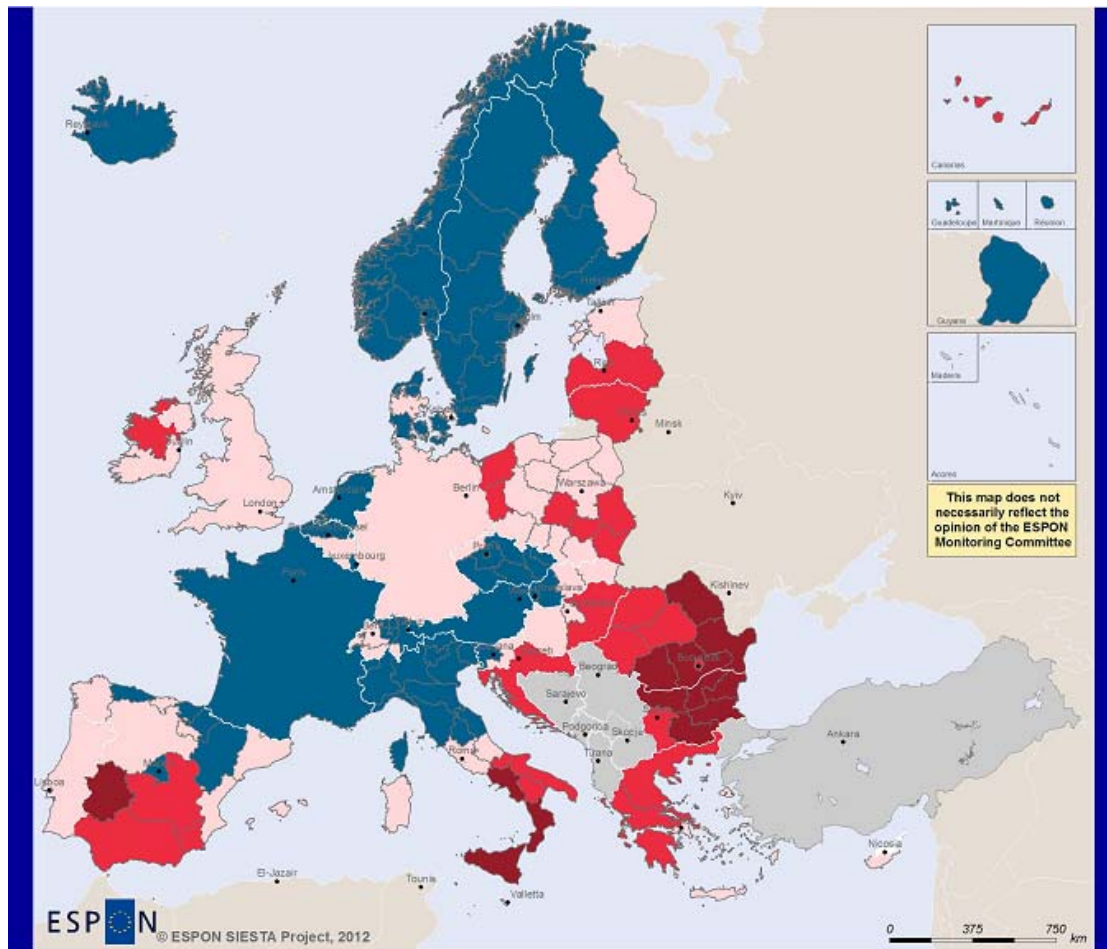
- The totality of Bulgaria, Romania, Lithuania and Latvia contain high percentages of population in poverty situation and at the risk of social exclusion.
- With the exception of the north of Italy and Slovenia, all the regions of the Mediterranean Basin maintain percentages of poverty superior to the average of the EU, especially the south of Italy and Spain.
- An interrelation exists between employment, income per capita and material deprivation rate. The persons in an unemployment situation

see their income limited and their purchasing power as well. Consequently, the expenses in non-basic products diminish drastically.

## Opportunities

- The regions of Europe with major risk of poverty and social exclusion coincide with those who register high unemployment rates. One of the keys to reducing the rates of relative poverty consists in re-formulating the employment policies and improving the education level of the population.
- The State must guarantee the basic well-being level implementing and/or consolidating services that attend to the persons in situations of absolute poverty.
- To give major weight to the social policies within the public administrations.
- To promote actions of awareness among the population so that they contribute to helping social services with most disadvantaged (volunteer, agreements with big companies for economic or material support).
- To acquire commitments that help to reduce the poverty and the homeless: actions of awareness with the homeless encouraging them to the search for work and/or the use of the social services; to increase the number of homeless shelters, to create public dining rooms, etc.
- To establish a classification of the groups in poverty situation, in order to establish specific programs of social and economic progress for each of them (people in situations of absolute, relative poverty; young men, women or the elderly with insufficient or void income; long term unemployed, etc.).
- To guarantee social assistance (public residences, welfare support 24 hours, services of telemedicine) to the elderly, especially in the regions with a major ageing index.
- To promote campaigns of social integration and civil solidarity with the neediest.
- To give priority to the labour insertion in the families with all the members in unemployment situation.

# Map 38 Population at Risk of Poverty or Social Exclusion, 2010



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Regional level: NUTS2, NUTS1, NUTS0  
Source: EUROSTAT  
Origin of data: EUROSTAT, 2012  
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## People at risk of poverty or social exclusion rate (%), 2010. EU 2020 Target = 19.5%

### Below EU Target

< 19.5%

### Above EU Target

19.5% - 30%

30% - 40%

> 40%

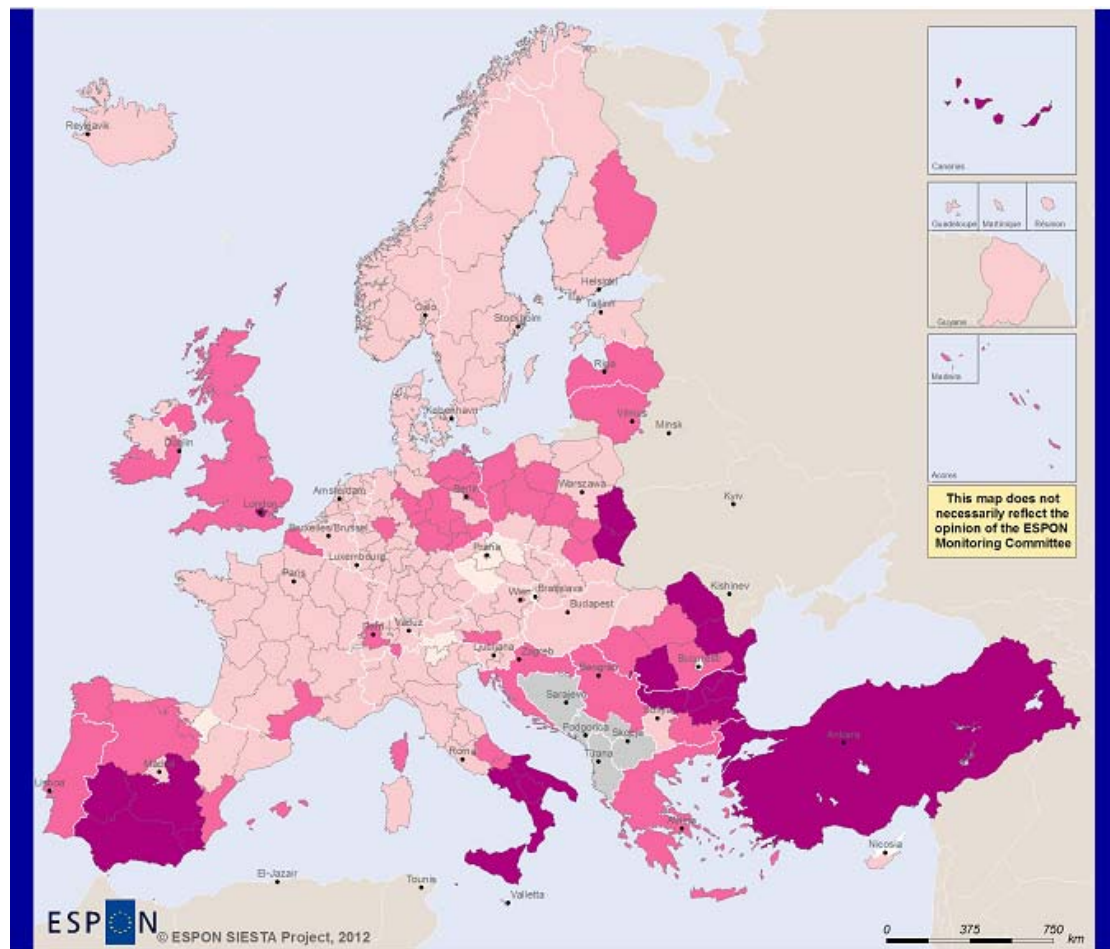
No data

Notes:  
EU27=23.5%

The Europe 2020 Target for reducing poverty is a reduction of the number of people at risk poverty or exclusion by 20 million people. This translate into achieve 19.5% of people at risk of poverty or social exclusion of the total population.

Data for AT, UK, FR, DE, NL and PT are shown at country level.  
HU, BE, and EL are shown at NUTS1 level.

# Map 39 People at Risk of Poverty After Social Transfer, 2010

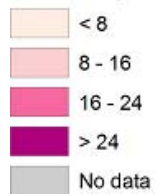


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Regional level: NUTS2, NUTS1 and NUTS0  
Source: EUROSTAT  
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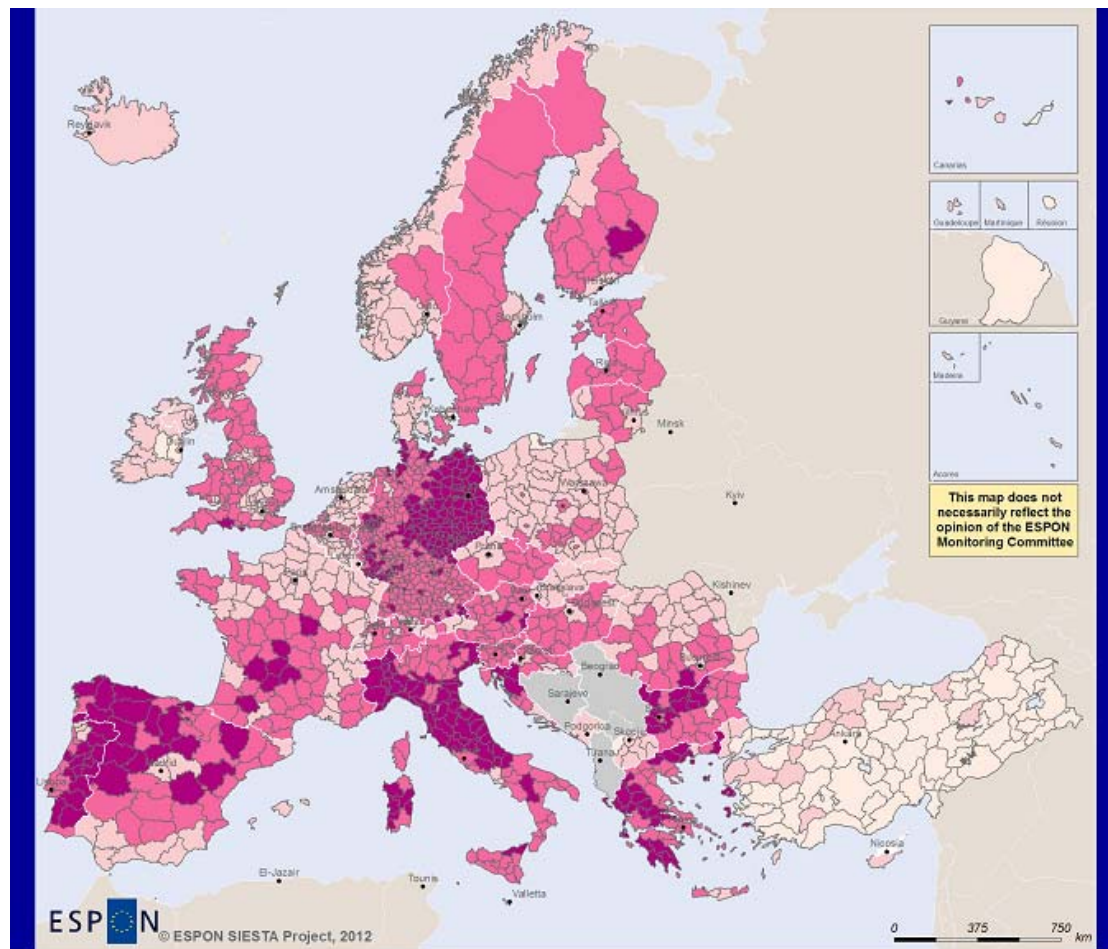
### At risk of poverty rate, 2010.



Notes:  
BE, EL, NO, and UK are shown at NUTS1 level.  
HR, RS, TR and PT are shown at country level.  
Data for FR, TR, UK, NL and RS are for 2009.

Indicator definition: The share of persons with an equivalised disposable income below the risk of poverty threshold, which is set at 60% of the national median equivalised disposable income (after social transfers).

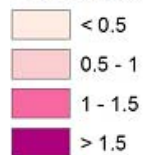
**Map 40. Ageing Index, 2010**




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Regional level: NUTS3  
 Source: EUROSTAT  
 Origin of data: EUROSTAT, 2012.  
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**Ageing index, 2010.**



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