

TERRITORIAL SCENARIOS AND VISION FOR EUROPE

Making Europe Open and Polycentric

**To seek Europe, is to make it!
Europe exists through its search for the infinite -and this is what I call adventure.**

Zygmunt Bauman, An Adventure called Europe

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Presentation

- The purpose of this document is to discuss the future development of Europe. Alternative scenarios towards 2030 and 2050 are analysed, and a Vision for the European territory towards 2050, and political pathways to make it possible, are finally proposed¹.
- The document follows up a long tradition on prospective studies² and policy documents in spatial development³ elaborated in Europe, in particular the ESDP (European Spatial Development Prospective, 1999). Recent European framework documents are also taken as starting points: Europe 2020 Strategy, Green Paper on Territorial Cohesion, European Territorial Agenda 2020, Common Strategic Framework (CSF), ESIF 2014-2020 11 Thematic Objectives, as well as the roadmaps for Maritime Spatial Planning, Transport, Energy, and Resource Efficiency for 2050. Visions and territorial strategies defined at regional, national and trans-national scale in Europe, and neighbouring countries, were also considered, together with relevant European legislative documents, such as the Single Market Act II.
- A participatory process with ESPON Monitoring Committee members representing European Union countries and countries associated to the ESPON program was carried out in five scientific and policy-oriented workshops in Krakow (2011), Aalborg (2012), Paphos (2012), Dublin (2013) and Vilnius (2013).
- The European Parliament (Regional Development Committee - REGI), the Committee of the Regions (Commission for Territorial Cohesion - COTER) and the European Commission (DG Regional and Urban Policy - DGREGIO) were consulted; workshops and discussions were organized during 2013 and 2014 together with these institutions.
- Stakeholders and experts were also consulted in a workshop celebrated by ESPON in Brussels (2013).
- The *Three Horizon Technique*⁴ was applied for the foresight exercise. The Vision proposed for the development of Europe is presented as a feasible evolution from the present situation, rather than as a picture of an ideal long-term future.

¹ The document was developed in the ESPON Scenarios and Vision project (www.et2050.eu), that began in 2011. In it participated consultancy, research institutes and academic institutions from 9 different countries. The project was led by MCRIT (Barcelona), with IGEAT (Brussels), POLIMI (Milan), S&W (Dortmund), IOM (Warsaw), RIKS (Maastricht), Nordregio (Stockholm), RKK HAS (Budapest), WSE (Warsaw), UTH (Thessalonica), ISIS (Rome) and ERSILIA Foundation (Barcelona). Full information is available at www.espon.eu, and ongoing works at www.et2050.eu.

² Worth to mention as main references the “Europe 2000” project (Hall, 1976), the “Geography of Europe’s Futures” (Masser, Svidén, Wegener, 1992), the ESPON 3.2 project (Robert, Lennert et al., 2006), and the “Global Europe” (Sessa et al., 2011). Other recent studies and researches on European foresight reviewed were TRANSVISIONS, PASHMINA, FLAGSHIP, SCENAR, LUMOCAP, among others.

³ In Annex 1, please find a detailed review of most relevant documents.

⁴ The *Three Horizons* technique is an established technique to organizing how we deal with uncertainty. **Horizon 1 is the space of the imminent future** - already somewhat determined by our present readiness, resource commitments and institutional capacities to make adjustments etc. **Horizon 2 is the space of willingness and change** and one’s assets are actively shifting to be able to realize opportunities and to adjust to new pressures. Here it is desirable and usually possible to both *forecast* by examining the implications of trends and drivers of change; and *backcast* by rigorously asking what would have been required to create the conditions for the aspirations and vision of Horizon 3. **Horizon 3 is the space of possible futures** of *what if...what could be...* and how we might recognize and realize opportunities, it is where powerful and compelling visions are described so they can enable leaders to break the inertia and fear of change that pervades most organizations. By enabling many stakeholders to collaborate on shaping the inputs to the Third Horizon, the process has already begun to proactively build the future.

Rather than presenting Complementary to the participatory and expert analysis, advanced forecast models were used.



Paphos, 4-6 December 2012



Aalborg 13-14 June 2012



Brussels, 28 September 2012



Dublin, 12-14 June 2013



Warsaw 22 Nov 2012



Mrs. Huebner, 26 February 2013



European Parliament REGI, 25 June 2013



DGREGIO EC, 25 June 2013



Vision Workshop, October 2013



COTER, 9 October 2013



Committee of the Regions, 19 February 2013

Illustration 1 Images from the various workshops celebrated (see www.et2050.eu)

A Vision for Europe, and the European Territory towards 2050 is needed

- **2050 is almost here.** We live in a world of emerging economies, fast population growth and massive migrations towards large megalopolises, exponential increases of flows of information, goods, energy and other resources. Hundreds of millions of people are moving from poverty to middle classes worldwide but, at the same time, absolute social and regional disparities grow also in the most developed world, also across European cities and regions. We face amazing technological prospects and major global environmental uncertainties. With increasing threats and opportunities, policy matters and political choices to be made nowadays will have a paramount importance to prepare a sufficiently satisfying future for all.
- **Territory matters.** Europe is a territory fragmented by many administrative and political borders. Europe is not a flat and empty space free from development constraints, but an old civilised territory made of hundreds of thousands of small towns and cities of all sizes, a predominantly man-made landscape, an extremely diversified mosaic of regions with different geographic characteristics and long memories behind. The growth in Europe is not concentrated in few fast growing megalopolis but distributed across complex networks of cities articulated at different geographic scales, from small towns in remote rural regions to global metropolis and gateways, from sparsely populated mountain areas and oceanic islands to densely urbanised coastal regions. Geographic distance plays a different role nowadays; paradoxically, when the economic value of place as location diminishes because de-territorialised information and communication networks, it regains its cultural and ecological values; on the other hand, while social and economic relations become less territorialised, as well as, to some extent, people identity, government largely remains territorialised.
- **Europe needs a Vision for the future of the territory.** A Vision for the future of the European territory is needed to bring coherence to the fragmentation inherent to the actual administrative structure of Europe. Even though Europeans have become more mobile and relations between large cities across Europe and the rest of the world have increased in the latest twenty years, cross-border relations are almost limited to those regions where always existed. European's mental geographies remain heavily constrained by political borders, a puzzle of contradictory national narratives.

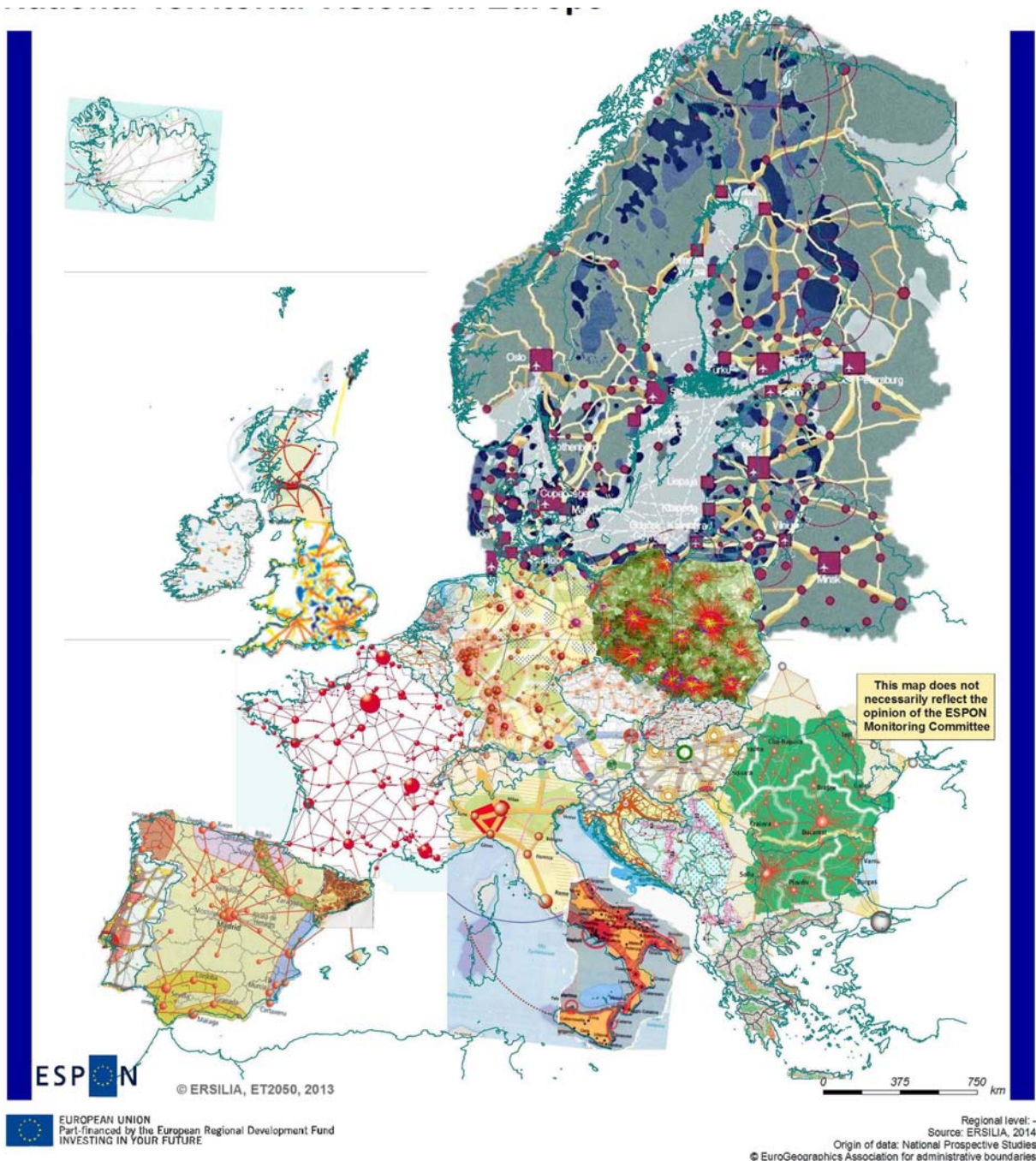


Illustration 2 Collection of Territorial Visions of Europe (2014)

- The **European Spatial Development Prospective** (ESDP) was the first integrated political vision of the future of the European territory. It was approved by the Informal Council of EU Ministers responsible for Spatial Planning in 1999. The key policy aims presented in ESDP were based on achieving a polycentric and balanced spatial development of the European Union⁵.

⁵ Policy-Aims of the ESDP

- Polycentric and Balanced Spatial Development in the EU
- Dynamic Attractive and Competitive Cities and Urbanised Regions

- Following the ESDP approval, the **Study Program on Spatial Planning** (SPSP) Program was launched, followed by the **ESPON** Program (currently renamed as European Observation Network for Territorial Development and Cohesion)⁶.
- The paramount political goal of these visions and studies was to somehow contribute to provide an integrated territorial development consistency to sectorial European policies as well as to the criteria to allocate European Structural and Cohesion Funds across territories and sectors. The Structural and Cohesion Funds, together with the Agricultural Funds, represents about 80% of the European Commission budget, which remains at 1% of European Union GDP. Structural, Cohesion and Agricultural Funds are the end-result of a long history of decisions taken since late fifties, often during complicated multi-party enlargement negotiations, and difficult reforms carried out overtime⁷. Both the Cohesion Policy, and the Common Agricultural Policy, have no yet the explicit political goals and targets that most other European policies have (e.g. monetary, environmental, energy or transport).

- Indigenous Development
- Diverse and Productive Rural Areas
- Urban-Rural Partnership
- An Integrated Approach for Improved Transport Links and Access to Knowledge
- Polycentric Development Model: A Basis for Better Accessibility
- Efficient and Sustainable Use of the Infrastructure
- Diffusion of Innovation and Knowledge
- Natural and Cultural Heritage as a Development Asset
- Preservation and Development of the Natural Heritage
- Water Resource Management – a Special Challenge for Spatial Development
- Creative Management of Cultural Landscapes
- Creative Management of the Cultural Heritage

⁶ Since the year 2000, **ESPON** has been conducting a number of research projects that have contributed to a knowledge-base on territorial dynamics. ESPON has the role to support policy development in relation to EU Cohesion Policy. The programme provides pan-European evidence and knowledge about European territorial structures, trends, perspectives and policy impacts which enable comparisons amongst regions and cities. This forms a basis for finding additional opportunities for growth as well as challenges that need attention in a world where the larger territorial context is an inevitable reality. For a decade ESPON has played this key role within EU Cohesion Policy in support of policy development providing comparable pan-European evidence, analyses and scenarios on territorial dynamics that help regions, cities and larger territories in taking evidence-based decisions on their future development.

⁷ The Social Funds, the European Investment Bank and the free movement of labour was secured by Italy, the weakest economy among the European Economic Community in late fifties, in the Treaty of Rome (1956), as well as the **Common Agricultural Policy**, introduced by France, the most competitive agricultural sector. The **European Regional Development Fund** was created during the British accession aiming to assist its own regions as well as to balance its net contribution to the Community balance (about 80% of the funds are allocated to regions having less than 75% of European average GDP). It was only in 1985, with the arrival of the Single Market, the acceleration of European integration, and the Single European Act (1986), that the Community cohesion (or regional) policy was officially launched as such, and the term “**Social and Economic Cohesion**” introduced. In 1988, when the Structural Funds were reformed, cross-border cooperation became eligible for funding from the Structural Funds, and the Community cooperation initiative **INTERREG-I** was set up two years later. The first generation of INTERREG programmes was initiated during the programming period 1989-1993 of the EU structural funds. **Cohesion funds** were created in the Treaty of Maastricht in 1992 to provide for national investments on transport and environmental infrastructure, supporting weakest economies after the adoption of a single currency, and the re-unification of Germany. The process of enlargement to Eastern European countries, net recipients of Structural and Cohesion, and Agricultural funds also required specific reforms. The term “**Territorial Cohesion**” was first introduced in the Lisbon Treaty (2007), as rather ambiguous concept, that was further developed later on in the Green Paper in Territorial Cohesion (2007).

- The **Treaty of Rome** (1956), building up from previous agreements⁸, established the first milestone towards the economic integration of European countries. The “European project” was conceived by leading policy-makers as process of gradual political integration, an stepwise process, driven by increasing economic interdependency, to overcome the nationalistic conflicts that caused the wars that destroyed Europe, the latest in 1940-1945.
- The **Treaty of Lisbon** (2007) states in Article 3 that the Union shall establish the Single Market as well as it shall work for the sustainable development of Europe based on balanced economic growth, a highly competitive social market economy and a high level of protection and improvement of the quality of the environment. It shall also promote economic, social and territorial cohesion, solidarity among Member States, and respect its rich cultural and linguistic diversity. These political aims are in line with the so-called “European model”: well governed democratic societies, with efficient public policies promoting prosperity for all, that were the basis for the European economic recovery during the 1950s and 1960s.

Lasting Values and Policy Paradigms for Europe

- The Vision for the future of the European territory proposed, and the political pathways necessary to achieve it, is based on the values and policy paradigms shaping the “European project” since the Treaty of Rome of 1956 to the Lisbon Treaty of 2007, as **an open Community of equals with common strong institutions** promoting peace and deep democracy, sustainable development and solidarity, as well as social, economic and territorial cohesion.
- **Deep democracy and good government**: predominance of the rule of law, compliance with the Charter of Fundamental Rights, and the rights of minorities. Transparent and accountable institutions, and public service oriented to empower citizens and promote participatory government.
- **Sustainable development, well-being and quality of life**: universally accessible human and harmonious development, encompassing three dimensions: economic, environmental and social⁹.
- **Territorial efficiency and cohesion**: overall harmonious development reducing disparities between regions. This is achieved through considering both the efficiency and equity dimensions of development, and establishing two interdependent although different policy objectives: all regions must be given the opportunity to achieve their full potential, using their specific territorial capital (territorial efficiency), and all citizens must enjoy an equivalent quality of life¹⁰.

⁸ The first agreement was the **European Coal and Steel Community**, covering the industries that provided the industrial base for a war. Robert Shuman, French Minister, affirmed the 9th May 1950 in launching the agreement, that “any war between France and Germany would become not merely unthinkable, but materially impossible”.

⁹ In the **Lisbon Treaty**, in Article 3, three dimensions of cohesion are mentioned: economic, social and territorial. 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 (Article 174).

¹⁰ The goal of achieving ‘**harmonious development of economic activities**’ was explicitly included the Treaty of Rome of 1956. The creation of an internal or single market removing barriers to the free circulation of people, services, goods and capital was at the core of the Treaty. Since the economic development of different European countries was uneven, the common market was supposed to generate uneven opportunities and threats across regions, risking to increase the economic gap among them, and their political cohesion. In 1975 the Structural Funds were created to provide infrastructure to less developed regions, after the accession of Denmark, U.K. and Ireland (Structural Funds are mostly allocated to less developed regions, those below 75% average GDP). With the accession of Portugal, Spain

- **Internal Solidarity:** common European space of stability, through shared work and/or diversified financial supports to guarantee financial stability, energy interdependence, migration and EU border management, adaptation to climate change, combating urban and rural poverty and unemployment, including commitments of responsibility by those receiving financial aid¹¹.
- **Solidarity with the Neighbourhood regions and the rest of the world:** promotion of the values of the “European model” –democracy, open and inclusive societies and environmental protection, in the rest of the world.

Europe now, in the crisis aftermath¹².

1. During the 1990s and early 2000s, just before the 2008 crisis, the progress towards the Single Market was considered an overall successful history. Macroeconomic stability was considerably improved during the 1990s, a strong emphasis on cohesion was preserved, and social welfare largely improved in less developed countries and regions. At that time, concerns were mostly related to the so-called “Steady Decline” of the more developed European economies¹³, in comparison with the rest of the world, particularly USA and emerging markets in Asia. European more advanced countries seemed mature, slowly declining economies, with limited technologic innovation, not efficient-enough governance systems, and losing political influence at world level; the underperformance of more advanced European economies was considered striking because it contrasted not only with expectations but also with the past performance and the rest of the Western world accomplishments. These views suddenly changed.

2. European concerns changed with the economic crisis, the worse since 1929, becoming not much focused on the relatively low growth of more developed European countries but on the increasing North-South and West-East economic unbalances. The insufficient coordination and financial solidarity at European level resulted in higher costs for all. The rapid growth in Southern countries, leading to great social welfare improvements, proved to be financially unsustainable because of not enough productivity improvements, and the growth in Eastern countries was perceived as vulnerable because of the dominant role of foreign direct investments and their volatility.

3. After one-, one-and-half decades of catching-up period, the comparatively faster growth rates of lagging regions stopped in 2007-2009. Although global financial capital has, undeniably, come to play an

and Greece, the so-called **center-periphery pattern**, became more evident. The Single Act of 1986 at the same time reinforced the process of economic integration, and created the Cohesion Policy by reforming Structural Funds. In 1989, after the reunification of Germany and the enlargement towards Central and Eastern European countries; the Treaty of Maastricht in 1992 included both the monetary integration and the so-called Cohesion funds (distributed among States below 90% average GDP to finance transport and environmental large projects), additional to the Structural Funds. From mid nineties, until the crisis of 2008, the process towards the Single Market and Cohesion policies were considered successful: European Union countries had continuous economic growth and relative disparities diminished, overall, while infrastructure and social welfare in less developed regions improved significantly.

¹¹ A clear distinction has to be made between cohesion policy and other financial solidarity mechanisms to tackle common financial, energy, climate change, migration and social challenges. While the latter are mostly new means of financial redistribution among Member States and Regions, the former is targeted to trigger institutional change and to break inefficiencies and social exclusion traps through the provision of public goods and services by applying redistribution policies (some places may receive more from interventions than they contribute through taxation) that by nature are temporary and should not be permanent subsidies.

¹² This chapter presents “First Horizon”

¹³ Between 1995 and 2007, the western European Countries (EU15) grow at an average 2.43% yearly, against 3.17% of the USA, and well below emergent economies. Germany grew 1.60% on average, France 2.20% and Italy 1.53%; but 3.22 the UK.

important role in all ‘transition’ economies, many post-socialist countries in the Centre and East of Europe are amongst the hardest hit, and Central and Eastern Europe is falling behind its peers in other emerging markets. The global financial and economic crisis exposed the weaknesses of the post-socialist economic development model in East-Central Europe, as well as in many Southern European regions, where growth and welfare increases were not only related to productivity improvements but also to the inflow of resources, from migrants to foreign investments in many sectors, including speculative markets, and excess of consumption resulting in excessive levels of private debt.

4. The convergence process of the previous decade has suddenly been reversed. Southern countries, larger recipients of Cohesion and Structural Funds, have reduced their GDP¹⁴ during the crisis, around 10% in Spain and Italy, more than 20% in Greece, with very high official unemployment levels, especially among youngsters; at the same time, Central and Northern countries were stagnant or had small growth. Eastern European Countries have had different evolutions, some of them still growing at moderate level, like Poland, as well as Baltic countries, after carrying on drastic fiscal reforms.

5. While more developed countries are expected to keep growing in the crisis aftermath because of productivity increases, less developed countries may grow in their way out of the economic crisis because of the reduction of the current unemployment levels, and a reduction of salaries in real terms. Low-income-based competitiveness represents a development trap that counteracts the accumulation of financial and social capital, hinders upgrading to high value-added production, and encourages migration to higher-wage regions. The reduction of salaries is uneven across sectors and social classes. Disparities are also increasing in social welfare because of the reduction of public expenditures and investments.

6. Regional disparities are also growing; in new member states capital regions are the winners, while rural and eastern border regions are the losers¹⁵. Isolated, peripheral, socio-economically weak regions are much stronger hit by the crises than central, export oriented regions with stronger adaptive capacity to react to external shocks. Future European structural intervention based on the European Cohesion Policy should therefore integrate concepts like vulnerability and sensitivity to external shocks, and exposure to the possibilities to be harmed. Building adaptive capacity on regional level should be one of key priorities for European Cohesion Policy. Clashes between growth- and sustainability-oriented policies are to be expected, and development may involve different sectoral mixes than in developed regions.

7. Towards the Urals, in the east, across de Mediterranean sea, in the south, the economic development gap is excessive, a major cause of social and political instability. On the one hand European and the countries in the Mediterranean, the Middle East and the East of Europe, will be increasing relations and exchanges, in terms of labour migration and tourism, provision of energy resources, or direct investments in areas such as manufacture, logistics and tourism. On the other hand, the social and economic gap is added to the history of the colonialism, especially in the southern Mediterranean countries.

8. During the crisis, many barriers and constrains to the full implementation of the Single European market, as well for opening up of European markets to the rest of the world, have not been removed as expected before the crisis. More strict constrains to external, even to internal migration, are being adopted.

¹⁴ Even if the GDP measure of growth is to a large extent obsolete, it is nowadays the best indicator of economic growth, despite internal contradictions and statistical errors (e.g. the “hidden economy” may represent up to 25% of GDP in many countries). On the other hand, the goal of a socio-economic order is to sustainably improve human well-being and quality of life, whereby material consumption are means to that end, not ends in themselves. A new frame needs to be set up to account features of well-being “beyond GDP” (adding measures of the natural, human and social capital, and a better measurement of intangibles assets).

¹⁵ Out of the 132 European regions below GDP per capita average in 2010, 84 are expected to experience further regression from EU average (65%), according to MASST model. Large urban agglomerations in Central Europe already constitute very significant magnets for internal migrations: Warsaw, Budapest, Vienna with Lower Austria, Bucharest, Sofia, but also Athens in the south and Stockholm in the north.

Europe, just because of its ageing population and energy dependency, will rely during the next decades on the Neighborhood countries and the rest of the world.

9. In its way out of the crisis, European firms are trading more with the rest of the world. Measures of economic protectionism were avoided. Each European economy have different trade patterns, however, depending of their sectorial specialisation, traditional cultural links and/or geographic proximity. For European economies, the rest of the world will become as important as the Single Market in the years to come.

Europe towards 2030¹⁶

10. **Average moderate economic growth¹⁷.** The annual growth for Europe may be about around 1,90%¹⁸ in average between 2010-2030 if actual policies and technologies remain without significant changes, and the rest of the world follows a baseline trend. Even if an average growth is foreseen for Europe, it is expected to be uneven territorially, with 44 regions grow less than 1% or even having negative growth over the whole period, mostly less developed Southern regions. Eastern European regions may grow around the European average, but growth is mostly focused on capital cities. The least developed regions won't probably catch-up with the rest of Europe before 2030. In a business-as-usual or baseline scenario, the more developed a country or region is now, the more chances it will have to keep growing in the coming years: the catching up processes that happened in the previous decades will not necessarily happen in future at the same speed, at least during the next decade.

11. **More Jobs and Lower Salaries.** The unemployment level in many European regions will keep driving salaries down in real terms at least for the next decade, and will also induce labour migrations towards more developed and ageing regions, with much higher salaries and better social welfare systems. More jobs are expected to be created elsewhere in Europe, overall, if the actual trend towards lower salaries will continue for the next decade. Employment will grow even in regions with low economic growth, where growth will result from workforce increases rather than by higher productivity, as it happened in many Southern regions from 2000 to 2008 when a large number of jobs were created and occupied by low-skilled immigration. During the crisis, the hidden economy has grown up to 25% in many Southern regions, as well as informal labour and family support, and will last for a longer time than in Eastern European regions, where the hidden economy will tend to gradually diminish since it is mostly related to self-sufficient agriculture in rural areas.

12. **Jobs are likely to be created in both the manufacturing and service sectors across Europe.** A reindustrialisation process is expected in traditional industrial areas in the centre of Europe, recentralising high-quality and technologically advanced production, as well as in Southern regions where salaries will remain relatively low, making already existing industrial investments profitable enough to remain there for

¹⁶ This chapter presents the "Second Horizon" of the foresight .

¹⁷ MASST (developed by Politecnico di Milano, Milano) is an econometric and macroeconomic partial equilibrium model. In the frame of ET2050, MASST model has been upgraded in-depth. Version 3 of the model includes public expenditure growth rates (based on the relative difference between deficit/GDP ratio and stability pact targets), innovation rates (function of human capital and R&D intensity), urban growth (function of traditional and unconventional urban benefits and urban costs, e.g. quality of life, social conflicts...), and regional unemployment growth (dependant among others on labour market, structural funds policies, FDI). The MASST upgrade allows also to explicitly take into account fiscal policies and therefore the impact of the current economic crisis.

¹⁸ Monetary policies considered by MASST in the Baseline scenario include, in Western European countries: stability of interest rates, ULC, exchange rates, inflation; Progressive convergence of Eastern EU towards Western European Countries values; Decrease of interest on bonds: end of speculation periods. Fiscal policies assumed in the Baseline include: Increase of tax rates in the Western and Eastern Countries. Debt/GDP remains constant.

a longer time, and delaying delocalisation plans. Eastern regions, that received a large inflow of foreign investments during the latest decade, from both Central European and Southern European regions, may see this inflow slowing down, that can be compensated by a net increase in the service sector, clustered in main cities, but growth in non-metropolitan regions will maintain a significant industrial element.

13. ***An average moderate economic growth is expected in the Central and Eastern European Countries¹⁹***. If a low growth of 2,2% is the case for CEECs towards 2030, the existing economic gap would hardly be modified and Central and Eastern Europe will remain on the European periphery. CEECs followed the pattern of a dependent market economy type of capitalism which is characterized by high dependency on imported foreign capital. The role of foreign savings in promoting economic growth in the CEE-12 countries was undoubted in the short run and in a growth environment but this is rather not true in the long run and in crisis times therefore the strong correlation between higher FDI increase and higher growth can not be proved. Foreign investors not only contributed to the modernisation of the economy, but also increased its structural and spatial segmentation created by the “dual economy”. The strong correlation between higher FDI increase and higher growth can not be proved in the CEECs.

14. ***More rapidly increasing national disparities in the Central and Eastern European Countries*** as the convergence process and convergence process of previous decade slowed down and differentiated in a large extent among countries after the crisis. Sustainable catching up process is jeopardised by the dualistic feature of the transition economies unveiled the weakness of domestic sectors. Low-income-based competitiveness represents a development trap that counteracts the accumulation of financial and social capital, hinders upgrading to high value-added production, and encourages migration to higher-wage regions. Despite European catching-up processes, the large economic and territorial inequalities can not be eliminated in dependent economies due to constant capital scarcities. At regional level, we may see disparities growing more than before. In the new member states (NM13) capital regions are the winners, while rural and eastern border regions may likely be the losers. A continuation of the present situation towards 2030 years is a likely outcome, if there are no significant political or technologic changes. Clashes between growth- and sustainability-oriented policies are to be expected, and development may involve different sectoral mixes than in developed regions.

15. ***Insufficient productivity in the Southern regions***. The analysis of the GDP per capita performance reveal that Southern regions will hardly be able to recover from the crisis in the coming years, with Greece, Cyprus, South Italy, most of Spain and Portugal facing severe problems of economic instability and trouble in public finances. The growth in many of these regions was produced not much because of productivity improvements but because relatively high in-flows of capital, in cases on speculative markets, as well as people. The challenge for the coming decades is being able to valorise the important social capital investments realised, often because of European funds, to generate more productive economic activities. The importance of the informal markets is high, up to 25% of GDP in many regions, explains why large unemployment levels can be afforded. In the coming years salaries will tend to be reduced, and employment may recover. Industrial delocalisation, often towards Central and Eastern Regions may not continue, in this case. How many of these regions may support the welfare improvements during the latest two decades remains as a paramount challenge until 2030.

¹⁹The historical trajectory of Central and Eastern Europe differed significantly from that of the West and it was characterized by perpetual attempts of catching up. The nineteenth and twentieth centuries were characterized by three major periods (waves) of catching up with the West. Central and Eastern Europe in relative terms, comparing to Western Europe, is still behind its 1910 relative level. One-, one-and-half decades of gradual catching-up period with the West started in the late 1990s with faster growth rates and productivity increase, but this stopped in 2007-2009. Our calculations reflect less than half (40%) of the Western level achieved in Central and Eastern European countries by 2010.

16. **Population Ageing²⁰**. Ageing is and will be the most universal demographic trend across Europe, even if the scale of the phenomenon differs between countries and regions. Ageing will be fuelled by continuous increase in life expectancy, to 81 years for men and 86 years for women in 2030 and to 85 years for men and 90 years for women in 2050, combined with long lasting below replacement fertility²¹. International extra-Union migration tends to mitigate this process, whereas international intra-Union migration and internal migration tend to reduce ageing in large urban agglomerations and affluent, highly developed regions and increase it in peripheral, poorly developed regions. In Eastern regions, ageing combined with migration and limited savings will place a significant burden on national budgets; in the medium term, this will be compounded by a cohort of minimum-waged or 'informal economy' residents reaching pension age.

17. **Increasing importance of the "Silver Economy"**. Ageing will result on transformation of the provision of social services, such as health and long term care, for which demand may grow substantially. Silver economy will have to be absorbed into mainstream economic activities, both on regional and national levels. Provision of social security, in particular retirement benefits will be a substantial problem for national governments, as many of the national social security systems either already are or may become insolvent from the actual perspective. These challenges will have to be met under the conditions of decreasing labour force related to the exit from the labour market of the retiring post-war baby boom cohorts, combined with relatively small entry of young cohorts. The shrinking labour force and population ageing will have to be counterbalanced by an increase in labour productivity and delayed exit of older workers (increased statutory retirement age and increased labour force participation).

18. **More labour migration within Europe²²**, between and within countries, will still be low in comparison to the USA, which also has a much younger population. Migration in Europe is expected to grow because of economic reasons: if less developed countries do not catch-up with more developed European countries, they will not be able to offer better jobs and higher salaries to most of their population. At the same time, population ageing in more developed countries will create need for young foreign labour. Most developed cities will compete for more skilled and creative persons. The large volume of the labour migration from East to West and from South to North can be a serious threat to societies and economies of sending countries. Since migration is highly selective (migrants are usually young and equipped with better human capital), it will also have a substantial impact on age structures and pool of skills. Skilled and qualified people will be attracted to large global cities all over Europe in search of better job opportunities but favouring particular skill groups which are in high demand. This mechanism will have a powerful detrimental effect on sending regions, increasing regional disparities.

²⁰ MULTIPOLES (developed by CEFMR, Warsaw) is a cohort-component, multistate, hierarchical population projection model, capable to model population and labour force (by sex and 5-year age group) for multi-country, multiregional systems or for multi-ethnic systems. It can be used to produce projections, simulations and forecasts of complex hierarchical population systems and to analyse the impact of various scenarios concerning migration, fertility, mortality and economic activity on population and labour force size and structure. MULTIPOLES was specifically designed to model the impact of three categories of migration: internal, international within the system (e.g. within EU) and from outside of the modelled system.

²¹ In the Baseline, it is assumed that family friendly policies will prevail but fertility will remain low in Europe, with total fertility rate (TFR) increasing from 1.61 to 1.66 in 2030, then turning stable. In all ESPON countries, total fertility rate will be below the replacement level of 2.1 births per woman both in 2025-2030 and 2045-2050. Future life expectancy, underestimated in most forecasts up to now, is assumed based on ESPON DEMIFER LSE scenario, increasing from 77 to 81 years for men and from 83 to 86 years for women in 2025-30 and to 85 years for men and 90 years for women in 2045-50, narrowing the gap in life expectancy between men and women. Convergence in regional and national life expectancies is expected in consequence of cohesion policies.

²² In the Baseline, it is assumed low economic performance favouring anti-immigration positions. The number of immigrants is assumed growing slowly to respond to the labour shortage related to aging of Europe. Until 2030-35 extra-Europe immigration is assumed to increase by 2% every 5 years, then to be remain constant. In the most crisis-hit countries the increase is delayed by five years. For international intra-Europe migration (age and sex-specific emigration rates) it is assumed that in the least crisis-hit countries the rates will be constant, as estimated for 2010 based on the MIMOSA project (*Migration Modelling for Statistical Analyses*, funded by Eurostat), the IMEM project (*Integrated Modelling of European Migration*, funded by NORFACE Migration) and the most recent Eurostat data

19. **External migrations will continue to increase.** Since no major changes in demographic policies across Europe are expected²³, the number of immigrants will be growing to respond to the labour shortage related to the ageing of Europe. Migration from third countries, especially from the Neighbouring countries will grow towards European Union regions with relatively large agriculture, construction or tourism sectors, as well as to large cities. It is assumed that until 2030 extra-European immigration may increase by 2 per cent every 5 years, and that afterwards it will remain constant. In the most crisis-hit countries the increase will be delayed by some years.

20. **Internal non-labour migration.** In Southern regions migration due to residential tourism is already high (some 800.000 people in the Spanish Mediterranean coastal regions, with a significant variation over the year), and will likely grow. It is becoming a positive social and economic development driver of health and other advanced personal services. Demographic trends are extremely heterogeneous and unstable across Southern regions. While in some regions migration was extraordinary since 2000s, and is currently reduced or even reversed, other regions suffered depopulation. Towards 2030 these trends may be even exacerbated; on the one hand coastal areas will be extremely attractive for residential tourism and large cities may be able to attract skilled people, while rural inner areas may face depopulation.

21. **New forms of sustainable tourism** in areas such as education and training, health and leisure, cultural and business will emerge. Tourism will grow as much as middle classes also grows at world level. Many European cities and regions will become destinations for tourism and many cities and regions will have to be able to manage massive flows to avoid stereotyping their cultural and ecological assets, also creating exclusive or segregated zones. In their way out of the crisis, it is likely that land-use restrictions preventing the urbanisation of sensitive areas, mostly coastal areas, be relaxed, and therefore tourism also represents a serious threat for the preservation of natural and cultural landscapes.

22. **Transport demand will be more diversified and will increase below economic growth**²⁴ Transport demand may be decoupled from economic growth, at least for urban and short-distance mobility in more developed cities and regions, but it is not likely neither for freight and passengers nor for long-distance, particularly for intercontinental transport. More diversified trip purposes and specialised transport modes are expected, while transport costs for passengers and freight may remain stable in relative terms if social and environmental externalities are included in the price of transport somehow compensating savings from technological innovation²⁵. Market inefficiencies inside Europe will gradually likely diminish because of the completion of the Single Market on transport and other network industries, and there will be a gradual

²³ The Treaty of Amsterdam (1997) and the Tampere European Council (1999) gave the EU responsibility for setting a Common Immigration and Asylum Policy, with the principal aim of making migration safe and legally controlled. Since 1997, EU member states will have to progress in developing a common position on these issues, The Lisbon Treaty (2007) strengthened the ability of EU authorities to determine member states' immigration and asylum policies. Advances towards developing a common migration policy are being made, in particular by developing various directives (eg single permit directive, directive on the right to family reunification, directives concerning students and researchers ...).

²⁴ MOSAIC (developed by MCRIT, Barcelona) is an integrated modal split and assignment model originally applied to TRANS-TOOLS trip distribution matrices. MOSAIC has been upgraded to generate future transport demand based on regional increases of GDP and population. MOSAIC is designed to analyse the impact of alternative transport policy-scenarios (pricing, taxation, infrastructure, fleets...). MOSAIC integrates modal split and traffic assignment in one so the modes do not compete to carry trips but contribute to form multi-modal chains, and modal split is the end result of the process, not the starting point. MOSAIC is built upon a multimodal transport graph integrating road, rail, air and ferry networks, for Europe and its neighbourhood

²⁵ MOSAIC determines future travel demands based on the following assumptions: elasticities of trip generation vs GDP/capita for interNUTS3 trips are derived from TransTools 2010/2030 matrices (TENConnect, 2009) and TV+ metamodel, with a quadratic formulation fitted between the variation rate of GDP/capita and the variation rate of trip generation, then applied at NUTS3 level using GDP and population growth assumptions 2010-2030 from MASST and Multipoles. A doubly constrained Growth Factor model is used to distribute the trips, ensuring the sum of trips originated equals the sum of trips distributed. Resulting trips per OD are divided in 4 trip purposes proportionally to original Transtools 2010 matrix.

opening of global markets to more competition. While in most Eastern European regions still there are important infrastructure deficits constraining economic growth, in many Southern regions infrastructure endowment is already high, in part because of Cohesion and Structural Funds, to the point that infrastructure is one of the main assets for future development²⁶.

23. **Energy intensity will gradually decrease** because of the more service oriented European economies, and the increased energy efficiency and savings. Carbon intensity (GHG emissions elasticity in relation to energy consumption) is expected to decrease due to improved technology, especially wind and solar sources. More in general, renewable sources are expected to grow²⁷ and nuclear facilities gradually dismantled, diversifying energy sources and reducing the energy dependence of European Union's countries, even if the energy costs in Europe may remain higher than other developed world regions, particularly USA. More interconnected and decentralised production will bring higher efficiency. New energy technologies (e.g. nuclear fusion) seem unlikely in the next decades but they will provoke a revolutionary change, if they happen.

24. **Urbanization will increase**²⁸. The urban surface may still grow rapidly (898 km² per year of new artificial land between 2010 and 2030, on average²⁹), often in the form of uncontrolled urban sprawl. Main drivers for urbanisation are people migration from rural areas to cities and people using more residential space per capita (e.g. larger houses, less people per family). Although industrial and commercial land uses tend to become denser, the overall process is towards increasing urban surface. The problem is not just the increase in sealed soil, but even more where does development take place (e.g. on fertile soils, with the risk of losing these and the nature and the ecosystem services related to it) and how does development take place. Tourism is the greatest consumer/user of the Mediterranean coast. The crisis is inducing the relaxation of planning regulations. Overall, the attractiveness of the region because of cultural heritage and weather remains as a precious asset to be protected and valorised.

25. **Environmental stewardship of land.** Over the past decades there has been a large decline in agricultural areas, especially in pastures and perennial crops. This process is expected to continue for a few more years, with strongest declines expected on marginal lands. Conversion from agriculture to all other land uses is expected throughout Europe, with large changes from low productive lands to natural vegetation³⁰. This brings challenges regarding rural depopulation and good stewardship of the land, but can also be seen as an opportunity to restructure and strengthen the rural areas. Europe, its Member States and its regions are at a crossroad to decide how they want to continue with the agricultural areas. Should food security be a crucial aim or should more space be devoted to energy crops, or does the decline in

²⁶ Given the scarcity of public funds, investments in transport infrastructure will likely be reduced, from 1,04% of EU GDP in total concerning transport investment, to about 0,80% (about 1.970 billion up to 2030 in total, with 330 billion allocated to TENs, 60% of the required investments to complete the networks), depending Private-Public Partnerships.

²⁷ 20% of gross final energy consumption from renewable energy sources by 2020, 50% by 2050 (EC Energy Reference Scenario, DG Energy 2014)

²⁸ Metronamica (developed by RIKS, Maastricht) is a dynamic and spatially explicit cellular automata-based land use model that allocates regional land use demands to local grids. The model is used for scenario studies, policy analysis as well as research projects. It has been applied worldwide. Applications include stand-alone versions as well as integrated systems (such as Xplorah, MedAction and WISE) that include the Metronamica land use model.

²⁹ Although the rate of change has an overall tendency to diminish, considering that the rate of land-take amounted 973 km²/year between 1990 and 2000, and peaked at 1598 km²/year between 2000 and 2006.

³⁰ For the Baseline, Metronamica assumes similar general land-take behaviour (rules) as that of the historic period 1990-2006. Demographic and economic evolutions are based on Multipoles and MASST models, translated into land-use demands and allocated using assumptions based on historical developments. New infrastructures and accessibility assumptions are based on MOSAIC.

agriculture area offer possibilities to connect high value natural areas into a green infrastructure throughout Europe?

26. **Global warming adaptation.** The impacts of Global warming are uneven in Europe, and also the response capacity is different, higher in the North and Centre of Europe (the most affluent regions) and lower in the East and in the South (the less affluent regions). Moreover, local characteristics, as for example the exposure of a region to natural hazards and the population density, are decisive for the vulnerability of a region. These include lowland coastal regions subject to sea level rise risks, lowland regions exposed to river flooding, mountain regions with high dependence on winter and summer tourism. Cities are also facing the highest challenges as they are home to a major part of the population and are crucial to Europe's economy as centres of major economic assets and innovative activities, possessing a high damage potential.

Europe in the World, and the World in Europe

27. **European countries will trade as much with the rest of the world that among themselves.** The emergence of Asian economies, followed by South-American, and subsequently by African, will result in a multi-polar, largely urbanised world, linked together by dense communication and transport networks. Therefore, the Single European market will gradually become less important, in relative terms, than the rest of the world for companies producing in Europe³¹. Free market agreements will be gradually achieved between the European Union and USA and NAFTA, as well as with the Eastern and Southern Mediterranean countries and other regions of the world. The European Union represented in 2010 about 28% of the world GDP, and it is expected to represent no more than 17% in 2050.

28. **More diverging trade patterns across European countries.** Companies located in different European countries and operating in different economic sectors will take advantage of the growth of emerging markets differently, based on economic specialisation, as well as historical links and geographic proximity (e.g. Germany will soon trade more with China than with France, UK with US and Commonwealth countries, Poland and Eastern regions with Russia and former USSR republics, Portugal with Brazil and some African countries, Spain with Latino America). The increase of exports to the rest of the world will make European foreign policy more difficult, since global national economic interest may diverge³².

29. **New globalisation based on the internationalization of value chains** The globalization model based on import-export of goods exploiting country level comparative advantages (e.g. low labour costs, availability of land or natural resources, etc.) and cheap transport costs will evolve into a new form of globalization based on the internationalization of value chains within regional clusters of countries, in particular in three main "vertical" regions on the globe: the North and South America, Europe-Middle East-Africa (joined in a "triangle of growth" originated by a strong cooperation in the energy sector and a common transition to a low carbon economy), and the Far East Asia and Australia. Off shoring (relocation) was been a stimulus to develop first Southern and then Central and Eastern regions as an important destination for resources seeking & efficiency-driven vertical investments. New member states invigorated by EU enlargement became important locations for shared service centres in CEEC, still an attractive

³¹ The European countries, with an average weight of exports and imports of around 40% of GDP, are more open with respect to the US or Japan, which are at about 15% of GDP. The new 12 member countries of the EU are significantly more open with respect to the old 15 members, with exports and imports at around 60% of GDP. The overall trade balance of the EU is positive, about 1,33% of GDP.

³² Exports and imports accounted for about one quarter of GDP in 1995, and have risen steadily afterwards, to about 40% in 2008. The economic crisis has hit this process, and openness decreased in 2009 but recovered in 2010. The trade balance has been fluctuating around 1% of GDP and remained positive throughout the period. Trade partners of the EU have significantly changed over time, the USA going from representing the largest export market for the EU with an almost 28%, to around 18% in just 10 years. Imports from the USA have declined rapidly as well from 22% to 11% in 11 years, and its role as the main exporter towards Europe has been taken by China, which in the same period has increased its share from 7% to 19% of the total.

supplier for mainly corporations as a growing number of outsourcing services seekers from Western Europe. Major companies after targeting its Asian destinations for off shoring services sector jobs, are now looking towards Eastern Europe to meet their near shoring requirements.

30. **Industrial relocalisation continuous.** Worldwide networks transmitting information and energy, transporting freight and people become interconnected at all scales, from the body of the world³³. Standardisation of manufacture process makes easier to move factories looking to reduce production costs. The centralisation of advanced activities is simultaneous to the decentralisation of low-added value activities. The just-in-time integration of worldwide information and financial flows increases vulnerability and should be balanced by local and regional endogenous resources and activities. In Europe, any policy is local, in the sense that it has local and regional impacts, which people are sensitive to.

31. **More cosmopolitan and mobile population.** Labour scarcity will create demand for young skilled and unskilled people from the rest of the world as well as from the neighbourhood countries in the East, and the South. The world has a whole may grow from 7.200 million people to 8.300 or even 10.900 million people in 2050, according to different forecast. Most of this growth will be concentrated in Africa and India. Migrations will come to Europe from all over the world, with different cultural backgrounds and skills, and within Europe people will migrate from rural sparsely populated areas to larger urban centres, mostly in Eastern Europe. Europe will have more cosmopolitan and multicultural urban populations. People older than 80 years may increase all over the world from 120 to 390 million people.

32. **Cities will play an increasingly important social, economic and political role at global scale.** Globally connected cities will continue to attract human capital and cluster higher added-value activities. Europe, while hosting few large metropolis, above 10 million people, has a balanced distribution of small and medium-sized cities all over the territory. Considering the challenges that global cities may have in terms of overconcentration, which could hamper sustainable growth, the polycentric structure of the European territory and the already large fixed social capital investments allocated in many cities, has the potential to facilitate a more balanced growth. European small and medium sized cities will have to increase their European and global connectivity without losing their social inclusiveness and cultural heritage.

³³ Container shipping has been growing at an average annual 10,6% between 1990 and 2005 at global level, with transshipment traffic growing by nearly 14% p.a. in the same period (source: Drewry). Global air traffics have doubled every 15 years since the 70s and are expected to keep growing at 4.7% yearly up to 2020 (source: Airbus).

Europe towards 2030

33. Alternative scenarios for the future development of Europe towards 2030 have been defined³⁴: “market based growth favouring large metropolis” (Scenario A), “public policies promoting second tier city networks” (Scenario B) and “public policies with more social and regional redistribution at European level” (Scenario C)³⁵.

34. **Promoting second tier city networks is an efficient growth policy for Europe.** The B scenario is the most expansionary in terms of GDP (+2,30% yearly), followed by the A scenario (+2,20% yearly). C achieves 1,80%. The higher expansion of growth in B can be explained by the higher and more efficient exploitation in this scenario of territorial capital elements, of local specificities, present in both large and second rank cities that allows local economies to achieve higher competitiveness. Development based on second rank cities implies the existence of an integrated and equilibrated urban system, made of efficient second rank cities working with first rank cities in providing quality services and allowing the latter to avoid strong diseconomies of scale that can be of detriment to growth. The weak presence of equilibrated and efficient urban systems in the Eastern countries may explain why these countries register very similar growth rates between the A and B, being both the result of growth supported only by first rank cities.

35. **Promoting second tier city networks is an effective Cohesion policy for Europe.** The B scenario turns out to be the scenario in which at the same time the highest cohesion and the highest competitiveness are achieved, emphasising that the preconditions for development widely lie in a hugely differentiated and scattered endowment of “territorial capital”, made up of natural and artificial specificities, varied settlement structures, cognitive and relational assets at different degrees of complexity and development. All these elements – especially those that are not yet fully or creatively exploited – represent the assets and potentials on which any development strategy should rely.

36. **Central and Eastern European development challenges towards 2030.** Scenario A in CEEC offers little in the way of integration possibilities for a large share of post-socialist space. Flows will orient even more towards national capitals, and resource concentration in mega-centres can be expected to encourage not only the backwash of local resources from the periphery (capital and human resources alike) but further de-industrialisation and accelerated tertiarization; the clear winners are the capital-city regions resulting in a dramatic increase in regional disparities. CEE countries would benefit vastly from the implementation of Scenario B. However, in Eastern regions the relative weakness of secondary cities may be a hindrance factor. In order to achieve this more territorially balanced vision through polycentric development the critical mass of second rank cities have to be promoted partially through the complex multifund integrated territorial investments. CEE having more numerous peripheral regions takes particular advantage of the Scenario C in which NMSs grow faster than western countries; the promotion of rural and peripheral regions in the new member states in Eastern Europe is stronger. A vision of integrated rural and urban areas might be the most favourable policy environment to mitigate regional inequalities and bring EU12 industrial milieus closer to Western Europe, since it would offer institutional incentives for the spreading-out of production and the reindustrialisation of the peripheries³⁶.

³⁴ Scenario A is a market driven variant, where welfare system is fully privatized; financial debt repaid in 2030; budget reduced for cohesion policies; concentration of investments in European large cities. Scenario B assumes public policies mostly at national level; actual welfare system reinforced through increased taxation; financial debt not fully repaid in 2050; budget maintained for cohesion policies; concentration of investments in second rank cities. Scenario C is a social policies variant, with strong public welfare system; financial debt repaid in 2050; budget significantly increased for cohesion policies; concentration of investments in rural and cohesion areas

³⁵ These three scenario variants for 2030 are in line with the A, B and C Scenarios defined for 2050.

37. Employment-wise, cohesion policies positively affect both rural and peripheral areas in the CEEC, which are expected to benefit the most from this scenario; This does not imply industry can retake its former employment share, but knowledge-intensive production can be more evenly spread, bringing with it further socio-economic advantages for smaller cities, towns and rural areas. The relevance of industrial development and its territorial differences maintain a key role in catching-up processes in the EU13. Under the baseline, industry can be expected to have a slowly diminishing share in employment and economic output, although its significance will stay above the Western European level. Development will continue to be FDI-dominated, although the gradual emergence of mid-tier companies in the EU13 is to be expected. With the dominant role of A scenario, resource concentration would be expected to encourage further de-industrialisation. The B and particularly C scenarios emphasise a higher significance of industry within the space economy, and more balanced growth patterns. Large cities can serve as integrators of industrial production and business services, while also maintaining spreading networks towards smaller centres. The C scenario offers the strongest vision of “spatial justice”, although at certain trade-offs. More dispersed patterns of innovative manufacturing can emerge, dominated by flexible small and medium-sized firms. In the Central and Eastern European Countries, the urban network shows a weakness on the tier of cities with 400-600 thousand inhabitants. It is unrealistic to propose to develop regional seats to Western European levels, but they must be able to fulfil their roles as regional centres. Urbanisation is compounded by the demographic decrease facing the macro-region, which has both natural and migratory reasons, and results in workforce shrinkage and the decline of economically active population. This puts brakes on the macro-region’s growth potential, and represents long-term capital loss, with specific areas “hollowing out”. The different scenarios do not imply radical differences from the baseline. The A scenario would lead to the highest degree of internal differentiation, while the others show similarities in offering a more territorially balanced vision through polycentric development.

38. ***Southern European regions development challenges towards 2030.*** According to the baseline scenario (2010-2030) the gaps between regions within Southern countries will grow, creating explosive social and political conflicts at national and European level. These countries are expected to show the same demographic diversity as today with a high net migration and a mild overall increase in old age dependency in comparison to the northern Europe. In terms of GDP per capita, the economic crisis is likely to have continuing impacts in most regions of the Southern European countries, however, with a positive total employment growth rate and diverse results in manufacturing and service employment. Overall passenger and freight accessibility is expected to increase below EU average with a few exceptions around important cities.

39. Southern European population is lower in Scenario A than in the Baseline, despite increased immigration, because of lower fertility. The comparatively high immigration in this scenario results to a strong reduction of the speed of ageing in the promoted regions of southern Europe. GDP growth is higher than in the baseline scenario in all southern countries of Europe with minor exceptions while the gains of employment growth (also in service and manufacturing) in almost all regions are positive due to increased external demand. Road will remain the main mode for passenger transport but Scenario A causes rail share to decrease by one half. The Scenario also shows a 32% average speed increase compared to Baseline 2010. Southern European population is slightly higher in Scenario B than in the Baseline due to higher immigration. It is the most expansionary scenario in terms of GDP due to the higher and more efficient exploitation of territorial capital elements and local specificities in both large and second rank cities. Employment growth rates seem to be comparable between the southern European countries and the rest of ESPON area and among the southern countries while service employment is more expansionary than manufacturing. Road will remain the main mode for passenger transport but Scenario B provides for moderate rail modal share increases. Scenario C will lead to a more balanced distribution of population between various categories of regions with a reduction of aging in the peripheral and rural areas mostly due to a reduced emigration of working age population. This scenario presents on average a relatively slower rate of GDP growth with respect to the Baseline scenario driven mostly by slower growth in these countries where rural and peripheral areas tend to benefit more. Employment growth in this scenario takes

place mostly in the most promoted regions while there is a clear distinction of regions in terms of manufacturing and services employment growth. Road will remain the main mode for passenger transport but rail has the highest growth potential in this scenario, up to 12% in 2030 compared to 6% in 2010. Finally, in all scenarios, long distance mobility is expected to grow below average from 2010 to 2030 and because of an increase in energy-saving techniques, the whole of southern European countries presents a noticeable decrease in CO2 emissions (especially in Scenario C).

Europe towards 2050³⁷

40. Towards 2050 the incertitude in terms of technologic development, behavioural changes of new generations, as well as in the effectiveness of public policies, grows exponentially. During the next decades technologic progress may reduce productivity costs enormously and facilitate the mass production of clean and fully customised goods and services, or it may further increase environmental externalities and social conflicts; technology may dramatically improve health and living conditions, empowering people, promoting more inclusive societies and participatory government, cosmopolitanism and environmentally conscious behaviour, or have just the opposite impact, further centralising world power in few large corporations, damaging the environment and modifying human condition beyond any social control.

41. **Smart Cities and Territories.** The “Internet of Things”, with the spread of sensors enables the gathering of huge amounts of data about the real world, and the sharing of this data through the cloud. Big data will be widely used to improve the efficiency of management systems at urban and regional scale. The integration of Internet with smart energy and transport technologies (smart grids, and new storage capabilities, including those given by electric vehicles connected to the grid) will change the way we consume electricity, from passive consumers to active customers. Most of the households will be associated to active electricity demand schemes, with their home appliances connected to smart boxes that enable optimized consumption/saving schedules. In addition to humans mediated interactions on the web. New smart vehicles and urban transport management systems, that will likely be more customised to user needs, such as systems of individual use and collective management, have the potential to radically change the landscape of European cities, most of them already engaged in ambitious traffic calm plans and promoting public transport. The reduction of pollution, noise and stress will make European cities even more attractive for people to work and live. Beyond “things”, “vehicles” or “energy”, a planet wide electronic communication grid will connect the thoughts and the feeling of almost all human beings, together with more intelligent and sensitive machines, changing human sociability in unexpected ways.

42. **More Fluid Sociability.** People will be increasingly disconnected from a single place for their production and consumption activities, due to the increasing flexibility and ubiquity of work, education, leisure and other personal activities enabled by the mobile Internet and cloud technology. Virtual communities and new forms of deterritorialised identities will emerge. A vast flow of accessible information will change our way to understand our relations with others, as well as our inherited prejudices and stereotypes. The virtualization of life and work and the increasing importance of teleworking, e-shopping, electronic communication and social media will establish new lifestyles, habits and mobility behaviours. Lifestyles will become more versatile, leisure activities more widespread, and the everyday life will become more irregular and quickly changing. A better fit between working time and leisure will likely increase residential mobility (more frequent changes of permanent residence as well as better use of secondary residences).

43. **More Responsible Values.** New generations will likely live longer and have healthier lives, thanks to molecular medicine and health care real-time monitoring. Europe’s ageing population will reflect the improvement of living conditions. This will have profound social and political implications, since values

³⁷ This chapter and the next one introduce the “Third Horizon”

attached to older generations used to be more prudent. The impact of ageing on growth is not limited to labour supply, as it also affects potential job growth via the higher demand for health and long-term care (where productivity advances are limited), and pressure on public finances because of the higher numbers of people living on pensions and incurring long-term health care expenses.

44. **Better educated workforce, more free-lance jobs:** Possessing adequate cognitive skills will be increasingly necessary to enjoy life, for self-esteem, for increasing income and for finding new jobs or founding new companies. A relative higher level of cognitive skills will also be required also in the less knowledge intensive services. A wider range of diversified jobs will be created mostly in the creative workforce, in eco-industries and in personal service sectors across Europe. However, a relative reindustrialisation may also occur in traditional industrial areas in the centre of Europe, recentralising high-quality and technologically advanced production. Industry will remain a backbone of competitiveness in non-metropolitan Eastern regions, shifting to deeper territorial embeddedness and higher local added value.

45. **Further decentralised, highly interconnected networks.** The energy and transport sectors will be fully integrated, with fleets of electric vehicles providing energy storage capacity when they are parked into urban and peri-urban solar parks connected to the grid. Thanks to these developments, Europe will be in a new era of *localized energy independence*, with entire neighbourhoods or factory development being served through distributed renewable power. In the short-term, more sustainable energy sources and means of transport will likely emerge, leading to more decentralised networks and hybrid solutions, such as modes of transport neither private nor public, individual but of collective use. Breaking trends, such as energy fusion or teletransport even if unlikely in the coming decades, indicate the human wish for infinite energy, and instant mobility.

46. **Renewable energy.** In the North of Europe a ring of offshore wind-farms in the five territorial waters of the North Sea, as well as several offshore wind-farms in the north-western Atlantic, connected to the European super-grid, and in the South of Europe high-voltage transmission lines crossing underneath the Mediterranean to connect the European grid to centralised solar plants built in the Sahara desert. The potential energy from the winter winds in the North (especially in the wintertime) and from the sun in the South (especially in the summertime from Southern Europe, but almost permanently in the Sahara desert) will be connected and available through the grid, improving the overall balance of the electricity system in Europe.

47. **Lesser energy dependence.** European energy security is going to be enhanced through a better interconnection of the energy grids that allow to fully access to the renewable resources from the North (wind) and South (solar) Europe, plus a residual nuclear production and gas, and shale gas, production from the North Sea and South-East Mediterranean (near Cyprus) sea basins. This is however not enough to ensure self-sufficiency, and Europe will still predominantly depend, although less dramatically, on gas imports from the Eastern (Russia) and Southern neighbourhood countries. Security will also be enhanced also through the diversification of gas imports, as a share of these imports come from the US. Energy security demands – particularly in Eastern regions – will encourage the growing western, but also north-south integration of energy networks, leading to increasing density.

48. **Transition towards a Low carbon economy.** Energy intensity (energy consumption elasticity in relation to GDP) will decrease due to more service oriented economies and the increased resource and energy efficiency in production and consumption. Carbon intensity (GHG emissions elasticity in relation to energy consumption) is also decreased thanks to improved technology. A transition will take place from a system characterized by high fuel and operational costs to a model based on higher capital expenditure and lower fuel costs. Impressive energy savings will be achieved during the first half of the century.

49. **Successful socio-ecological transition.** The European domestic economy will enter in a phase of qualitative, rather than quantitative, growth. This stems from three main factors: the European demographic structure, which includes a high percentage of inactive population (below 25 years and over 70 years, with an average life expectancy of 85 years, gives 40 years of inactivity for a working period of 45 years); environmental constraints, which regulate growth while improving its quality and sustainability; and a larger share of low-productivity services (including personal services to ageing population). However, Europe will restore its competitiveness through an industrial rebirth of high productivity activities derived from technological innovation. The whole economy increasingly operates with the contribution of the social sector, including organizations funded from private, public or hybrid sources, geared to the needs of people and ecosystems, while not driven by market forces or the exclusive profit motive.

50. **More productive and ecological agriculture.** Climate change is expected to decrease the productive capacity of agricultural land in other regions of the globe, while increasing it in the North of Europe, thus providing Northern Europe with a competitive advantage. As a result, the productive capacity of Europe's rural areas has become a yet more valuable resource, with a stronger emphasis on food production. Rural areas no longer invest in traditional crop-farming and stock-rearing industries, but instead focus on a new rural economy (e.g. tourism, local trade and products) and manufacturing and service industries more directly associated to bio-resources and organic agriculture.

51. **Efficient resource management systems.** Integrated management of water resources will become a key-component of territorial cooperation strategies applied by Euregional and macroregional authorities to transboundary river basins, and succeed in developing a sense of solidarity between upstream and downstream areas of these basins. Sparsely populated areas will still be land reserves, highly convenient to locate extensive activities, often with environmental impacts, while many southern coastal zones maybe densely urbanised and face important environmental conflicts.

52. **Green areas refurbished and cultivated within the urban boundaries** will help to increase urban biodiversity. Due to integrated land use planning and facilitated by policies to combat urban sprawl net land take will be almost negligible. Urban agriculture, redevelopment of brown fields, greening of the city by green rooftops, vegetated walls, enlargement of urban green, enhancing the quality of the green urban areas, and connecting urban green to the wider green infrastructure network are all initiatives that have improved the quality of life and increased biodiversity in cities.

53. **The sea becomes a valuable source of economic development**, constituting a key pillar for trade, growth and employment. These valuable marine potentials are explained by the richness of the European seas in energetic, mineral and food resources as well as by their transport possibilities. There are six seas in Europe, the Atlantic Ocean, the Arctic Sea, the Baltic Sea, the Black Sea, the Mediterranean Sea and the North Sea. Towards 2050, the marine potentials from the European seas will have been exploited, and the related challenges tackled. Together with other instruments of the European policy – Integrated Coastal Zone Management, the Integrated Maritime Policy (mostly focused on maritime transport), and Maritime Spatial Planning, the strategy will contribute to dramatically improve maritime governance. The international governance environment will be greatly improved. The UN WEO will establish a legally binding legal framework which is included in all sea governance arrangements.

54. **Increasing self-sufficiency** in areas such as food production, energy or water management, production and resource management will tend to become more local. Europe will successfully tackled the challenge of decoupling resource use from economic growth by essentially using less and yet continuing to allow economies to grow and completed a socio-ecological transition towards a low carbon economy. Energy intensity (energy consumption elasticity in relation to GDP) will decrease due to more service oriented economies and increased resource and energy efficiency in production and consumption. Carbon intensity (GHG emissions elasticity in relation to energy consumption) is also decreased thanks to improved

technology. A transition takes place from a system characterized by high fuel and operational costs to a model based on higher capital expenditure and lower fuel costs. Impressive energy savings will be achieved during the first half of the century.

Territorial Scenarios for Europe towards 2050

55. The three scenarios developed for 2030 (A, B and C) have been redefined for 2050 in more explicit territorial terms. To deal with the increasing uncertainty of a longer time horizon, these three alternative territorial scenarios for 2050 are evaluated against different extreme framework socioeconomic and environmental conditions³⁸. The purpose of the exercise is not predicting likely futures but assessing the alternative territorial strategies in terms of economic growth, regional disparities, land-use taken and the environmental impact because of transport activities, in energy and emissions.

56. ***The promotion and networking of European Metropolises towards 2050*** (Territorial Scenario A) would involve the further development of capital and global metropolis, as well as existing global gateways. It follows to a large extent the *Europe 2020* strategy of promoting global competitiveness of Europe by facilitating the economic development of the largest metropolitan areas of global importance in Europe, i.e. of the 76 Metropolitan European Growth Areas (MEGAs) defined in ESPON 1.1.1 (2005, 118). The policies applied are mainly investments in MEGAs supporting of high-level R&D as well as European transport infrastructure, such as high-speed rail, and enhancing connections and long distance networks and global gateways. More integrated transnational zones emerge by the networking of cities in cross-border areas, and transport and energy corridors link major European centers of production and consumption with neighbouring countries and the rest of the World. The scenario assumes that for the European global competitiveness it is crucial to take full advantage of the connectivity to international networks and the agglomeration economies of larger European metropolises.

³⁸ The forecast has been carried out with the SASI model, a recursive simulation model of socio-economic development of regions in Europe subject to exogenous assumptions about the economic and demographic development of the European Union as a whole and transport and other spatial policies. SASI model is especially well prepared to analyse policy impacts in long-term scenarios since it is a dynamic integrated model. For the land-use modelling, METRONAMICA model was used.

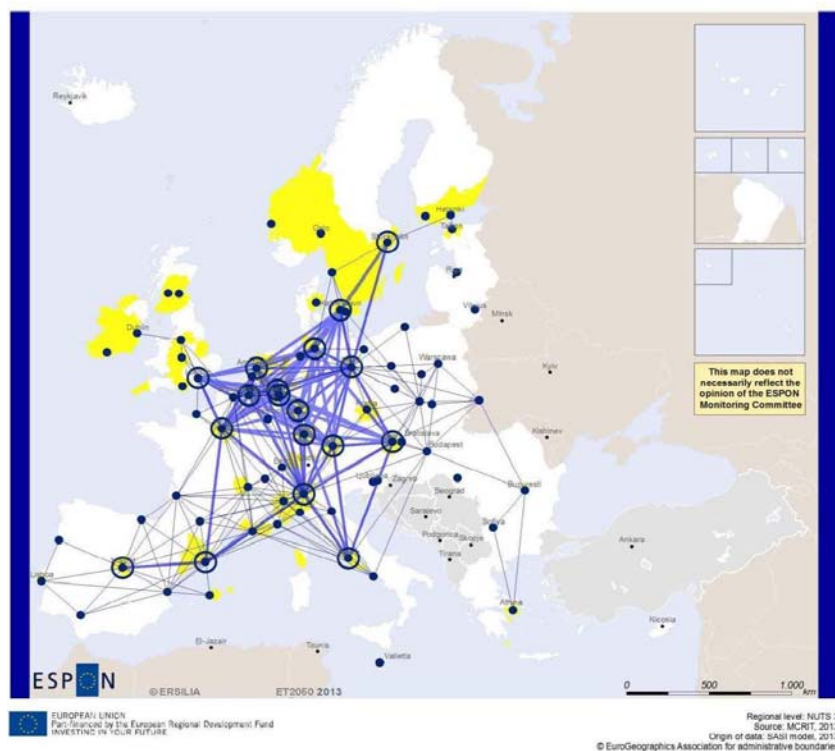


Illustration 3 (A) Territorial Strategy towards 2050 ³⁹

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Illustration of Scenario A

Based on results obtained by SASI forecast model (2050)

- MEGA category 1
- MEGAS
- MEGA (category 1)-MEGA (category 1) links and length < 850 km
- All MEGAS- all MEGAS links and length < 850 km (where population origin and population destination/length > 5000)
- Relative increases in GDP 2051 per capita Scenario A/Baseline average over 50 (100=EU31 ave)
- No data (No ESPON space)

57. **The promotion and networking of cities towards 2050** (Territorial Scenario B) provides an image of the European territory in which economic and population growth, as well as most private and public investments, take place within national capitals and major regional capitals, and there is a geographic reorganization and specialization of global gateways. It follows the priority of the European Spatial Development Perspective (1999) and the two Territorial Agendas (2007; 2011) for balanced polycentric urban systems at the macro-regional or national scale for the 261 cities of European or national significance defined in ESPON 1.1.1 (2005, 114). Cohesion and Structural funds are mostly targeted to cities, including urban renewal and reurbanisation, R&D investments, and promotion of regional and inter-regional transport networks. The increasing concentration of added-value activities in cities does not necessarily imply a process of rural decline, but its increasing functional dependency on large cities. In this scenario, large cities attract both more people and activities because of the effective public policies promoting them. Internal migrations take place from sparsely populated areas to larger urban centers.

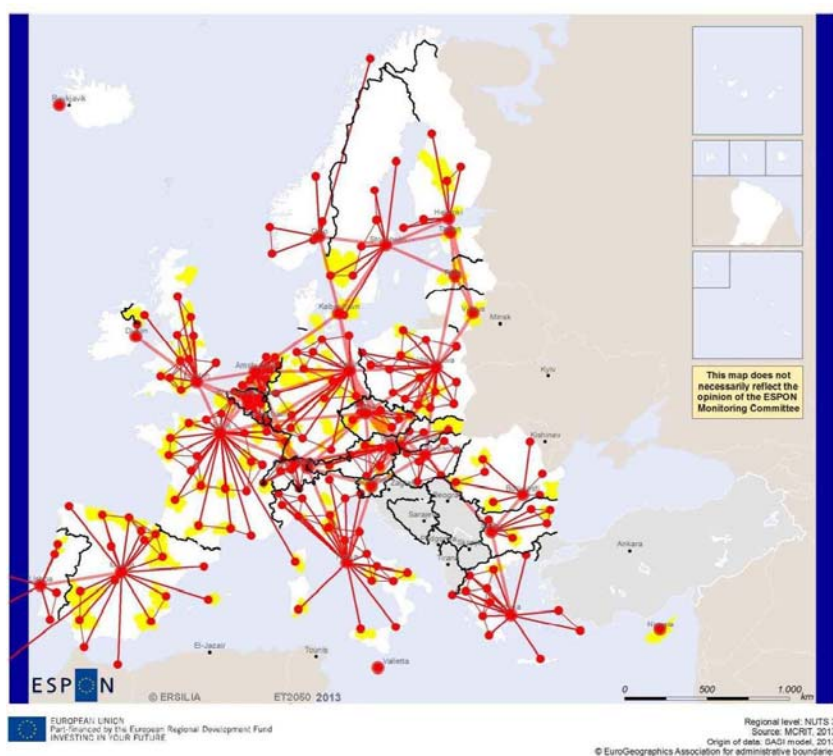


Illustration 4 (B) Territorial Strategy towards 2050⁴⁰

58. **The promotion of small cities and less developed regions towards 2050** (Territorial Scenario C) provides an image of the European territory in which urban and rural territories form a mosaic of different regions and types of territories with identities nourished by local and regional governments able to cooperate in areas of common interest. This scenario involves a paradigm-shift and responds to the challenges of energy scarcity and climate change expressed in the Territorial Agenda 2020 (2011) by promoting small and medium-sized cities as centers of self-contained and economically resilient regions

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Illustration of Scenario B

Based on results obtained by SASI forecast model (2050)

- Capital NUTS0
- Capital NUTS2 (NUTS1 only Germany and United Kingdom)
- NUTS0 boundaries
- NUTS0-NUTS0 links and length $\leq 650\text{km}$
- NUTS0-NUTS2 links intra NUTS0 (except Germany and United Kingdom)
- NUTS0-NUTS1 links intra NUTS0 (only Germany and United Kingdom)
- NUTS2-NUTS2 links intra NUTS0 and length <math>< 200\text{km}</math> (except Germany and United Kingdom)
- NUTS1-NUTS1 links intra NUTS0 and length <math>< 200\text{km}</math> (only Germany and United Kingdom)
- Relative increases in GDP 2051 per capita Scenario B/Baseline average over 100 (100=EU31 ave)
- No data (No ESPON space)

with more sustainable mobility patterns yet taking account of the necessary economies of scale of services of general interest and the prospects of an ageing society. Policies applied are mainly from the fields of Cohesion and Structural Funds targeting mostly rural less developed areas, and transport investments focused on local and regional networks, with a larger number of global gateways, more geographically distributed. The focus lies on promoting medium-sized cities and reducing the existing imbalances at the medium and lower level of the urban hierarchy and their functions for the surrounding regions. Local production and local markets gain much importance, migration of skilled people from large cities to rural areas accelerates localism, large cities become further decentralized into more productive, slow neighbourhoods. Policies are focused on reinforcing the social and economic balance of Europe at the regional level in a strong place-based approach, promoting endogenous development and empowering regional institutions leading to more efficient provision of public services. Changes in consumer behaviour favouring proximity and self-sufficiency. Intense decentralisation at local and regional level. Many of the changes in this scenario require changes of values and behavior of new generations, and policies to become a support for these, rather than a substitute. In this scenario, small and medium-size cities attract people based on their cultural and environmental quality, and public incentives. Only limited external migrations are expected.

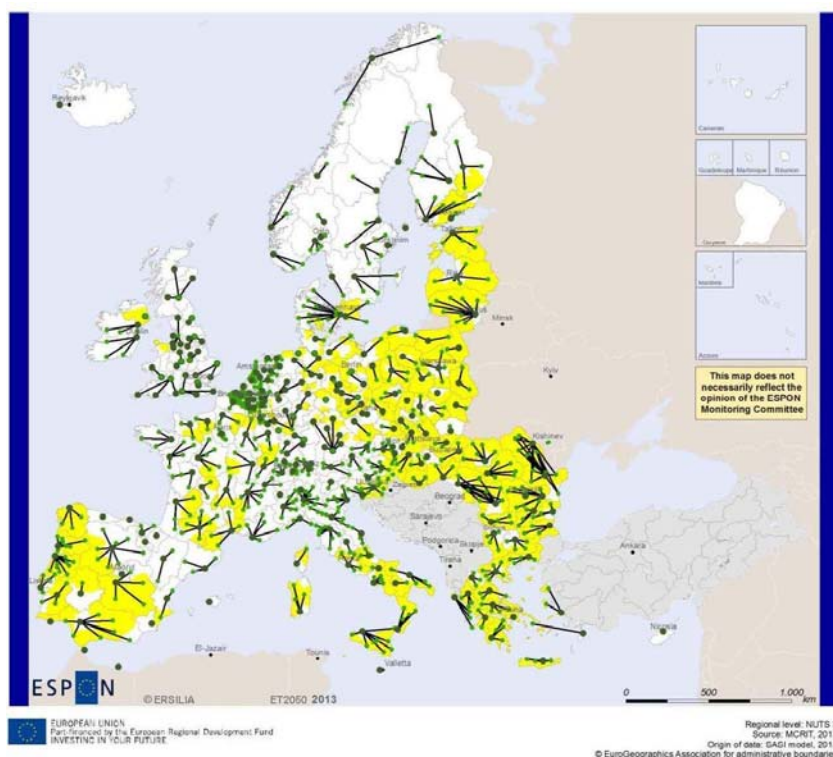


Illustration 5: (C) Territorial Strategy towards 2050⁴¹

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Illustration of Scenario C

Based on results obtained by SASI forecast model (2050)

- Capital NUTS 2
- Capital NUTS 1 (only Germany and United Kingdom)
- Capital NUTS 3 (except Germany and United Kingdom)
- NUTS1-NUTS2 links intra NUTS2 (only Germany and United Kingdom)
- NUTS2-NUTS3 intra NUTS2 links (except Germany and United Kingdom)
- Relative increases in GDP 2051 per capita Scenario C/Baseline average over 100 (100=EU31 ave)
- No data (No ESPON space)
- NUTS2 Boundaries

Assessment of Territorial Scenarios for 2050

59. ***The long-term average growth of Europe is not reduced by redistributive policies:*** Economic growth in the long run is not significantly affected by the promotion of any of the three strategies presented (A, B and C)⁴². A similar average growth can be obtained in the long-run with alternative policies favouring either metropolises and larger cities in more developed regions, or medium and small cities in more peripheral regions⁴³. Economic development mostly depends on technologic changes leading to increases in productivity, and public policies such as fiscal and monetary policy. Therefore towards 2050 scenarios A, B and C would result in a similar average economic growth for Europe as a whole⁴⁴, under the same framework conditions, meaning that, under these conditions, agglomeration economies will have in Europe a relatively minor role as growth driver.

60. ***Regional development gaps are significantly reduced by redistributive policies.*** Policies transferring resources into second tier cities and peripheral regions as defined in B and C scenarios are effective to reduce economic gaps without diminishing the overall economic growth of Europe, even if they are not above the current levels (0,4% of European GDP). A basic modelling assumption is that resources being transferred are allocated to services and infrastructures that effectively contribute to increase the productivity of the regions.

61. ***Polycentric territorial structures induce more balanced growth.*** If polycentricity is measured by combining population size and economic growth distribution among the cities in a given region or country, then more polycentric structures provide for a better distributed growth in the long run. Where the most developed cities and regions within Europe cooperate as parts of a polycentric structure they add value and act as centres that contribute to the development of their wider regions. Polycentric territorial development policy should foster the territorial competitiveness of the EU territory.

62. ***New challenges for land-use management and planning.*** Due to the attraction of the metropolitan areas, rural areas are not too much impacted by the expected land uptake if the (A) territorial scenario is applied. Also the development of high-rise buildings expected in this scenario will result in a densification of the urban areas and limit land uptake. The main threats of the large metropolitan regions are the diseconomies of scale, as well as a large urban sprawl in the sub-urban environments of these metropolises, to be avoided by strict land-use regulation. Furthermore with a main focus on the metropolitan regions, there is a risk of depopulation of the countryside (abandonment of the less productive areas) and as a result good stewardship of the land. The main impacts of implementing the B strategy will be to balanced growth throughout Europe and the ability to keep cities land-use change manageable. Cities are expected to fulfil an important interaction with their hinterland and thus provide a balanced landscape in which both urban and rural areas can thrive. In the C strategy it is expected a bottom up approach to maintain the rural areas. Main benefit of Scenario C is the ability to maintain and protect

⁴² The modeling of Exploratory scenarios by MULTIPOLES, MASST3, MOSAIC and METRONAMICA for 2030 (with insights for 2050) is complemented with the modeling of scenario policy variants, and wild card-variants by SASI forecast model for 2050. In addition to the Baseline Scenario and the exploratory scenarios A, B and C, scenarios were tested with 3 additional alternative framework conditions (resulting on 9 scenario variants): Economic recession, where globalisation and growth of emerging economies lead to stagnation and almost decline of the European economy; Technology advance, where new innovations in labour productivity and transport technology result in significant increases in labour and transport system productivity; and Energy/climate, where rising energy costs and/or greenhouse gas emission taxes lead to strong increases of production and transport costs.

⁴³ Policies favouring the three alternative scenarios were modelled by SASI both as Cohesion and Structural transfers between regions at NUTS3 level (up to the current 0,4% GDP of the European Union), and accessibility improvements based on selected transport investments favouring the different type of regions.

⁴⁴ The spatial policies investigated make a difference of not more than 1,5% to 2,0% of average GDP per capita per year. If one considers that this amounts to between 600 and 1,100 Euro per capita per year that may not be totally irrelevant. But, as the relatively low cohesion indicator shows, these benefits will not be distributed evenly but may be much larger in the regions being promoted and much lower in the remaining regions.

valuable ecosystems, and enhance a vibrant hinterland. It is the scenario where most policy interventions in land-use management are required. Good stewardship of the land and cohesion are promoted through stimulating Less Favoured Areas. The main threat linked to the C strategy is an increasing fragmentation of the landscape due to less dense diffused developments throughout Europe.

Political Vision: Making Europe

63. **European institutions need to be reformed.** The European Union institutional framework is the result on an stepwise approach that has been successful in building up common policies and institutions overtime, but need to be in part re-designed to become more legitimate and efficient dealing with new problems and opportunities, particularly in relation to policies closely linked to the territory, such as Cohesion and Agriculture. The European institutions need to solve actual “democratic deficits”, and practice multilevel governance based on a new understanding of the subsidiary principle: until now, the ‘European added-value’ of actions and initiatives had to be demonstrated and justified taking care of not changing pre-existing political institutions with territorial jurisdictions (municipalities, regions, countries) but rather defining a framework within which these levels interact. In the future, it will be the “national added-value” the one that will have to be demonstrated in relation to the local and the European scales. On the other hand, the political culture of the Member States is excessively compartmentalised and only very few countries have been able to organise any kind of horizontal coordination of sectoral competences within their institutional systems.⁴⁵

64. **Globalisation and citizenship become main drivers for the “European project”.** We now enter in a new period where European political integration will not likely progress because of the economic interest of achieving a Single Market, which is well advanced despite important gaps in different sectors⁴⁶. The advancement of the “European project”, and the reinforcement of common values and policies, particularly social, economic and territorial, will likely be more related to the role that European countries would decide to play at global scale, leading the world in areas such as free trade, climate change and peacekeeping, and will require a deeper involvement of citizens, only possible if nationals of all Member States become European citizens and Europe is not only a union of countries but also a community of people.

65. **Closer integration with Neighbouring Countries.** The European Union will continue the gradual enlargement process, geographical widening the boundaries, and having closer relations and association with Neighbouring countries and the rest of the world. Eastern and Southern countries are part of the European history and share the same geography. Because of security, migration, energy and resource provision, logistics and environmental management, as well as just because of geographic proximity, the European Union and Neighbouring countries will necessarily be increasingly interdependent.

⁴⁵ The same was true of the Commission; aware of this gap, it took stock of the territorial dimension of Community policies in its internal report entitled *Community policies and spatial planning* in 1998. This finding was confirmed during the preparation of the *White Paper on Governance* (2000-2001), which mentions the need to analyse the territorial impact of policies such as those for transport, energy or the environment: indeed, it is by analysing this territorial impact that we highlight the contradictions and conflicting effects of the different policies.

⁴⁶ The European Parliament has evaluated the “cost of-non Europe” in € 800 billion every year, or 6% of the European Union GDP. To remove this cost would require to complete the Single Market and to

Territorial Vision: Making Europe Open and Polycentric

66. **Openness** to the rest of the world and to the Neighboring countries is a necessary condition for all European cities and regions to take advantage of the development opportunities created by global growth and technologic progress⁴⁷. The long-term sustained development of the European territory is linked both to valorise and exploit endogenous assets and promoting a balanced developed as well as to remove internal borders, reinforcing co-development strategies with the Mediterranean and Eastern Neighbourhood, as well as further integrating European cities with the rest of the world.

67. **Polycentricity** is necessary to spread development opportunities across European cities and regions, promoting endogenous sustainable development and gradually diminishing regional disparities⁴⁸. A gradual evolution towards more polycentricity at all scales across Europe, sensitive to the geographic conditions of each territory, not leaving any city or region behind, will achieve the best regional balance without diminishing the overall economic growth. Policies must be focused on city renewal, and networking, linking cities at both regional and global scale.

68. **Making Europe Open and Polycentric** remains the most convenient territorial strategy supporting the competitiveness, social cohesion and sustainability goals. The efficiency and quality of the European territory lies in networking cities of all sizes, from local to global level, as well as empowering people and local activities to valorise their own assets at European and global scale. The roadmap to make Europe smart, inclusive and sustainable, requires the European territory to become more open, and polycentric.

⁴⁷ The **Openness** goal is related to the *Green Paper on Territorial Cohesion* “**Connecting territories**” goal, based on “integrating the economy of places with the economy of flows”, and to the *Territorial Agenda 2020* “**Improving territorial connectivity**” for individuals, communities and enterprises as an important precondition of territorial cohesion (e.g. services of general interest), a strong factor for territorial competitiveness and an essential condition for sustainable development, “**Ensuring global competitiveness**” of the regions based on strong local economies as a key factor in global competition preventing the drain of human capital and reducing vulnerability to external development shocks, and “**Territorial integration in cross-border and transnational functional regions**” as a key factor in global competition facilitating better utilization of development potentials and the protection of the natural environment.

⁴⁸ The **Polycentricity** goal is related to the *Green Paper on Territorial Cohesion* “**Concentration and density**” i.e. better exploiting regional potential and territorial capital, “**Cooperation**” by overcoming division i.e. promoting co-operation cross boundaries but also better *consistency* between various EU and national policies with a territorial impact and supporting “**Regions with specific geographical features**” i.e. policy differentiation to accommodate the specific features of different territories, including regions with some geographic development challenges. In relation to the *Territorial Agenda 2020*: “**Promoting polycentric and balanced territorial development**” as an important precondition of territorial cohesion and a strong factor of territorial efficiency, **Encouraging integrated development in cities, rural and specific regions** to foster synergies and better exploit local territorial assets, and **Managing and connecting ecological, landscape and cultural values** of regions, including joint risk management as an essential condition for long-term sustainable development.

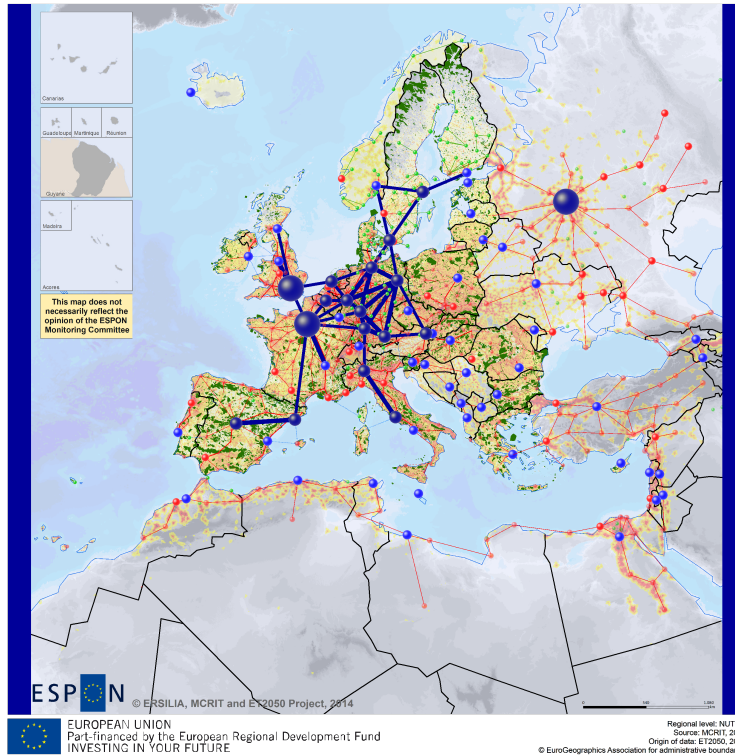


Illustration 1 "Open and Polycentric Europe" Vision towards 2020¹

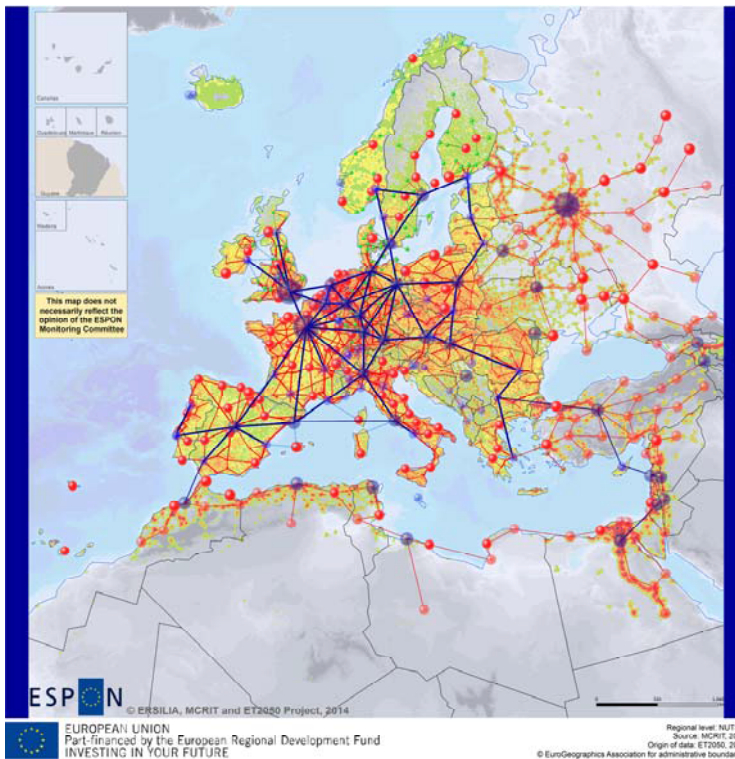


Illustration 2 "Open and Polycentric Europe" Vision towards 2030



Illustration 8 “Open and Polycentric Europe” Vision towards 2050⁵⁰

69. The proposed key territorial strategies to make Europe open and polycentric are “Connecting Europe Globally”, “Smart Regeneration of European cities”, “Enhancing Natural and Cultural assets of places” and “Making Europe regionally balanced”.

Connecting Europe Globally

70. **Opening up European markets and promoting global sustainable development.** The progressive opening of the European market to global competition, in parallel to the opening of other markets to European businesses will create fair and sustainable development if the higher European standards in terms of internalising social and environmental costs are gradually adopted by the rest of the world.

- Cities at European level 1
- Cities at European level 2
- Cities at European level 3
- Cities at Interregional level 1
- Cities at Interregional level 2
- Cities at Interregional level 3
- Cities at Regional level 1
- Cities at Regional level 2
- Cities at Regional level 3
- Links at European scale
- Links at Interregional scale
- Links at Regional scale

50

71. **Enhancing the efficiency of European network industries.** Efficient connections to transport, telecommunication and energy networks are indispensable to rise the productivity of local and regional activities at a European. Reducing demand for transport, telecommunication and energy is not a feasible option if it implies the reduction of social relations and economic activities. Instead, it is convenient to induce more efficiency on the network industries and reduce their social and environmental impacts. The integration of information and communication technologies together with the electrification of transport systems may bring impressive savings in terms of reducing transport and energy consumption and emissions, as well as improving safety and security, without necessarily diminishing social relations and economic growth.

72. **Decentralising European transport global gateways.** Global connectivity through maritime routes and intercontinental air services are as critical for competitiveness as the connection to the rest of Europe. During the next decades trade between European countries and the rest of the world will be as large as within the Single Market. The further increase on global trade will create new development opportunities in cities and regions well located as global hubs and gateways linking Europe with Asia, South-America and Africa, even if peripheral in relation to the rest of Europe. Nowadays, the largest European ports and airport gateways remain concentrated geographically close. The relative decentralisation and geographic specialisation of global gateways, would bring a net benefit to the European economy by reducing travel time and transport operating costs. It will also contribute to territorial cohesion.

73. **Enhancing cooperation with Neighbouring regions.** The cooperation between Europe and Neighbouring countries have to be straightened not only because of European labour and energy scarcity,. Neighbouring countries will become emerging economies and play a more central role at global scale. Global gateways emerge in Neighbouring countries, and trade and traffic across de Mediterranean, Middle East and Eastern countries will grow. European Union and Neighbouring countries need to be further integrated.

74. **Reinforcing the global centrality of European Metropolises.** Given the scarcity of land, the density of urbanisation and all related costs, to maintain their global relevance, European global metropolises have to adopt growth strategies based on decentralisation and networking.

Smart Regeneration of European Cities

75. **Promoting Second Tier Cities as engines of growth.** Europe has a relatively large number of cities and metropolitan regions enjoying a central position at global level in a variety of sectors and activities. European Second Tier Cities must become places of attraction and engines of economic growth with a high degree of social cohesion, platforms for democracy and diversity and places of environmental regeneration.

76. **Renewal of European cities.** The quality of European cities lies in promoting inclusive neighbourhoods and mixed land-uses, avoiding spatial segregation and protecting cultural heritage. Public spaces and public facilities are critical for the urban quality of European cities. European cities concentrate large investments on infrastructure, and are very resilient, also are complex and have heavy inertias making change and regeneration difficult. The implementation of new information and communication, mobility and energy technologies may have a decisive impact improving the environmental quality of European cities.

77. **Developing more compact settlement structures.** European cities have to grow avoiding urban sprawl by favouring high density urban development in strategic nodes and along public transport lines; forego further development elsewhere, and promote progressive ecological restoration of low density residential areas inherited from 20th century urban sprawl.

Enhancing Natural and Cultural assets of places

78. **Minimising the need for land-taken in more dense regions.** Sustainable agricultural practices must be promoted throughout Europe, including both sufficient income levels and good stewardship of the land.

79. **Valorisation of cultural landscapes.** The European territory is made of a diversity of places, from oceanic islands, isolated mountain areas, sparsely populated inner regions and density populates coasts, to global metropolises and small historical towns. The valorisation of the cultural heritage and the quality of the landscape, including aesthetics, are essential economic assets to make urban rural places more attractive for people to live and work, particularly for creators and entrepreneurs.

80. **Mitigation and adaptation of territories to Climate Change.** Mitigation of climate change (e.g. energy saving, reduction of CO2 emissions) is necessary. The physical, social, economic and environmental assets of several categories of European regions are impacted in various ways by the effects of climate change (sea level rise, more frequent river floods, heat, etc.). Working with nature instead of fighting against it is seen as common practice. Besides the challenges that need to be faced with regard to climate change, new opportunities also arise for cities and regions. This includes new business opportunities, enhanced forest growth, increased crop variety and yield and additional summer tourism in Northern Europe, even the possible opening of new shipping routes in the Arctic.

Making Europe more regionally balanced

81. **Unleashing the regional diversity of endogenous development potentials in all regions.** Most sustainable regional economic development patterns are based on the valorisation of endogenous assets in the European and global markets. For less developed rural regions, industrial and technologic activities linked to agriculture, tourism, renewable energies, natural resources and cultural heritage, are important assets for a more diversified economic development.

82. **Sufficient access to networks to open up local and regional potentials.** There is a need to provide sufficient access to transport, telecommunication and energy infrastructure not only to make a given territory attractive to exogenous investments but also to increase the productivity of endogenous activities. Excessive investment on infrastructure results on market distortions and have important opportunity costs associated, but on the other hand infrastructure scarcity heavily constrains development.

83. **Provision of universal level of services of general interest in all regions.** The access to services of general interest in sparsely populated and less developed rural regions is a precondition to maintain a certain number of inhabitants. Innovative management strategies need to be adopted to make this provision financially sustainable.

84. **Territorial integration in functional urban regions, cross-border and transnational functional regions.** More sophisticated and efficient formal cooperation mechanisms need to be implemented to make territorial integration feasible, especially in large metropolitan areas, cross-border “Euregios” and in transnational macroregions, most of which also encompass non-EU areas.

Pathways to make Europe Open and Polycentric

Pathways towards Connecting Europe Globally

85. *The goal of “Connecting Europe Globally”* is providing efficient transport, energy and telecommunication networks to European cities and regions to make possible for them to valorise their own assets not only at European, but at global scale.

86. *The main political actions* will be focused on completing the Single Market with the further liberalisation and harmonisation of the markets for network industries, progressing in the integration with Neighbourhood Countries, North-America and the rest of the world, supporting technological and management innovation as well as planning infrastructure extensions.

87. *The responsibility of the political actions* lies mostly on European institutions, in international institutions (e.g. specialised United Nations agencies) as well as in large private corporations in the sectors involved. Local and regional institutions have the responsibility to develop consistent development strategies linked to their enhanced connectivity.

88. *In the short and medium-term*, policies should favour the completion of the Single European Market and more coherence in infrastructure planning will gradually remove the costs of non-Europe in the internal market for network industries. *In the longer-term*, policies should open-up European markets for network industries to global competition and full internalisation of environmental costs have to become a priority.

- a. European institutions should lead, together with United Nations specialised agencies, the establishment of free trade agreements linked to the gradual implementation of social and environmental quality standards. International agreements to liberalise maritime deep-sea transport and intercontinental aviation, and telecommunication networks and services are necessary to support European global connectivity.
- b. The Single Market for network industries should be completed with sustained political, regulatory and anti-trust enforcement, investments and entrepreneurial effort to develop technologically advanced and interoperable infrastructure networks for transport, energy and telecommunications.
- c. Opening up European markets to global competition will induce a more efficient reorganisation of transport and other network industries in the European territory. By liberalising airport and ports the competitiveness of Southern and Eastern major transport terminals will be enhanced. To induce a more efficient and decentralised global gateway network in Europe, it is also necessary to internalise the environmental costs to make transport carriers more sensitive to geographic distances.
- d. Trans-European Transport, Energy and Telecommunication Networks extensions to the neighbouring countries will promote economic integration as well as a co-development broad strategy targeting cross-border zones.
- e. An intelligent electric grid covering Europe and Eastern and Mediterranean neighbouring countries would be able to integrate renewable sources such as wind, in the north, and solar, in the south, together with other conventional sources such as hydroelectric. Energy networks will provide for more decentralised production and consumption, and be fully interconnected to facilitate more diversification of sources as well as cost reduction and price harmonisation across Europe.

- f. Instead of further concentrating population and activities, it is by networking with other European metropolises and Second Tier Cities at national level that European global metropolises have to reinforce their competitiveness at global scale.

Pathways to towards the Smart Regeneration of European Cities

89. *The main goal of the “Smart Regeneration of European cities”* is promoting an urban renaissance all over the continent, as well as achieving a more networked development of the system of European cities, at regional and continental level, enhancing their world-wide influence.

90. *Main political actions* have to be focused on the promotion of a model of sustainable city reconciling prosperity, social welfare and environmental friendliness for each European city. City networking between metropolises but also between these and second tier cities, geared towards a synergetic model of sustainable economic development harnessing, on a complementary basis, the specific potential of every partner city.

91. *The responsibility for policy action* lies primarily with local and regional authorities, including groupings of such authorities in metropolitan areas. However, national and EU authorities also have a critical role to play in the transfer of financial means subject to conditionalities on both objectives and institutions.

92. *In the short and medium-term*, the urban dimension of the Cohesion policy is further developed including support to smart regeneration, including the renewing of neighbourhoods. *In the longer-term*, a consistent and formal system of cooperation between, and within, the European urban areas will be set up, involving metropolitan areas, cities/towns and their rural hinterland. The relevant policy steps are primarily taken at the level of functional areas, beyond administrative entities.

- a. Through the implementation of intelligent urban management systems, particularly in the fields of transport and energy management, European cities will become economically more efficient and will increase their environmental quality, reducing noise and pollution.
- b. By a deconcentration of public investments from capitals and a decentralisation of responsibilities, cities will be encouraged to improve their business environments and form networks at regional scale that allow them to improve their performance in European and global scale.
- c. By supporting strategic plans for territorial cooperation, moving from historical conflicts to jointly developing cities common assets territorial cohesion will be greatly improved.
- d. Cities will strictly protect the blue-green infrastructure, and be more flexible in zones dedicated to economic activities and residence; irrigate residential areas with public transport and slow mobility (pedestrians/cyclists) infrastructure while reducing car traffic speed and land take. European territorial policies should avoid that European cities grow with dispersed and discontinuous urbanisation, fragmented in segregated or exclusive zones connected to specialised networks.

Pathways to enhance Natural and Cultural assets in places

93. *The goal* is to protect and enhance natural assets and manage ecosystem services in a sustainable manner, both in more urbanised and less urbanised areas.

94. *Main political actions* that have to be taken are the reduction of uncontrolled urban sprawl and promotion of more compact urban development, with well-planned urban and peri-urban environments

and good accessibility, minimising negative impacts of soil sealing or uncontrolled development in pristine natural areas causing habitat fragmentation, as well as the reduction of highly productive agricultural soils. Special attention should be given to the protection of land under urban stress in sensitive areas, such as on the borders of existing cities and in the coastal zones. The establishment of a network of green infrastructure with reforestation and the reclamation of agricultural land is necessary in both more and less densely settled and/or depopulating regions. Overall, land-use and territorial development measures are indispensable for mitigation and adaptation to Climate Change.

95. *The responsibility of the political actions* lies both with the European institutions and the local institutions. International collaboration in the management of ecosystem services, which include river basin management and flood control, air quality, carbon sequestration and food and bio-energy production.

96. *In the short and medium-term*, European Structural and Cohesion, as well as Agricultural Funds are reformed favouring landscape and ecologic planning and management, as well as promoting public investments to buy strategic land under urbanisation stress. In *the longer-term*, a Green Infrastructure Network is developed linking Nature 2000 areas together with areas protected for strategic purposes. Plans for Natural Protection and Management are adopted.

- a. The acquisition of land, and other mechanisms to protect strategic land from urbanisation have to be included into Structural and Cohesion Funds as a possible allocation of the investments. Agricultural Policies (Pillar II) is redefined towards rural development and natural preservation and better integrated with Structural and Cohesion Funds.
- b. Subsidies to production will tend to be reduced in favour of objectives such as landscape management, ecologic production, more self-sufficiency and access to local markets.
- c. The decline of the agricultural areas in the late twentieth and early 21st century allows a restructuring of the rural areas and provides the possibility to create a green infrastructure throughout Europe, stimulating biodiversity and ecosystem services
- d. Integrated rural development plans outside the agricultural sector will promote tourism, improving commercial chains between producers and consumers, and promoting bottom-up public-private initiatives, at National and European level.
- e. Productive agricultural soils and high quality nature are -protected from urban development through strict planning, as well as cultural landscapes. Well-functioning ecosystems and the protection and enhancement of cultural and natural heritage must be considered as conditions for long-term sustainable development.
- f. The valorisation of cultural landscapes and management of the attractiveness of a given place always requires reinforcing local partnership. Landscape enhancement depends on citizen's active involvement, as well as proper formalisation in planning regulations that can be encouraged and promoted by institutions at European.
- g. Mitigation and adaption to Climate Change are included in urban and regional development plans, particularly in relation to the resilience of existing infrastructure, together with investment programs.

Political Pathway to make Europe regionally balanced

97. *The goal of “Making Europe regionally balanced” is to provide equivalent development opportunities among European regions. This entails taking appropriate positive discrimination steps towards less well-off regions.*

98. *To achieve this goal, main policy steps include the enhancement of the endogenous regional development potential, the improvement of regional infrastructure endowment, and the provision of an adequate level of services of general economic interest, especially in sparsely populated and less accessible areas. Targetted policy steps have to be successful to tackle issues faced by areas characterised by a specific permanent geographic or demographic handicap, such as islands, Arctic, remote (including ultraperipheral) or mountain areas.*

99. *The responsibility for policy action is shared between local/regional authorities and higher level authorities (i.e. member states and the EU). While mobilising all the relevant key-players in their respective region, the former have to conduct an on-going analysis of the challenges they face and their specific related needs. In line with the principles of the place-based approach, and account taken of the availability of financial means, the latter have to provide an appropriate framework to fund, supervise and adapt the local/regional development operations.*

100. *In the short and medium-term, Structural and Cohesion Funds have to be further reformed and better coordinated with Agricultural Funds to promote investments rising open endogenous development. In the longer term, cities and regions will develop integrated territorial development plans as a basis for intraregional cooperation and coordination of European sectorial policies.*

- a. Economic synergies between endogenous activities, networks of SMEs, and foreign investments should be promoted, as well as infrastructure useful to rise local productivity, and good territorial governance.
- b. Infrastructure investments need to be cost-effective, based on realistic future development scenarios, and always be valorised by territorial development plans defined together with citizens and local companies.
- c. Innovative management technologies are required to make financially sustainable to assure quality health services, education and welfare conditions for all Europeans.
- d. More sophisticated and efficient formal cooperation mechanisms need to be implemented to make territorial integration feasible

A New Generation of European Cohesion Policies

101. **A New Generation of Cohesion Policy is needed** to deal with the new challenges ahead. Structural and Cohesion Funds should be reformed following an stronger place-based approach, encouraging the development of integrated development plans in functional areas, empowering local and regional government to support more business-friendly environments and entrepreneurship. European funds have to be more sensitive to macro-economic cycles, as well as to the gradual opening of European markets to global competition. Structural and Cohesion Funds need to be better coordinated together with the Agricultural Fund for Rural Development (Pillar II, CAP). Transnational cross-border zones have to be promoted, such as the Baltic and the Hanseatic league, the Danubian region, the Black Sea, the Adriatic-

Ionian region, the Alpine region, the West Mediterranean⁵¹, as relevant geographic scales to define integrated spatial development policies.

102. **In the mid term, the challenge will entail drawing up an integrated strategy in the form of a Framework document⁵² applicable to the whole territory of the EU** which would reconcile the objectives of territorial cohesion and competitiveness, and impose a set of territorial conditions on Community aid allocated to sectoral policies, incorporating territorial considerations into every stage of planning (diagnosis, choice of priorities, methods, monitoring, evaluation of results and impact). The spatial development integrated strategy would be an opportunity to better coordinate European policies, generating synergies among sectors, in particular European funds with explicit territorial dimension (Structural and Cohesion funds, Pillar II CAP), with infrastructure and market regulatory policies in transport (e.g. TETNs), energy (e.g. Electric Grid), or environmentally protected areas (e.g. Nature 2000). The macro-regional spheres of transnational cooperation constitute excellent laboratories for governance and could prefigure such a strategy: the example of the Baltic Sea region has much to teach us in this context.

103. **European Territorial Development should finally become a European policy**, since it represents a major issue for territorial governance, for the coordination of sectoral policies and more efficient allocation and management of European development funds. Acknowledging the diversity of the European territory and further customising policies and fund allocations will no be sufficient to face global development challenges and reduce the costs of administrative and sectoral fragmentation. There is a need for a shared strategic planning of the European territory, based on an overall vision of its future development to support the better coordination of European policies with regional development with local and regional spatial development plans.

A New Governance Approach⁵³

104. **A New Governance Approach:** As it concerns its own institutional architecture, the EU will continue to be built around the principle of subsidiarity enshrined in Art. 5 of the Treaty, and the EU overall architecture will remain also in 2050 anchored to this principle, according to which functions of higher levels of government should be as limited as possible and should be subsidiary to those of lower levels. As a result of the subsidiarity approach, the EC provides the underlying support needed for the implementation of a lean integration model, which also fully benefits from the wide variety of institutions within the different Member-States, particularly cities and regions. A pragmatic approach is also maintained, whereby subsidiarity and additionally are the key concepts in providing legitimacy to newly multi-governance approaches linking the action of the EU. Beyond the nationalistic idealism born in the late eighteen century, European governance has to be redesigned the best possible way to promote sustainable and inclusive development for the next generations of Europeans.

105. **Managing policy interventions through functional territories.** Whereas the first phases of European construction focused on a process of inter-governmental integration, the future prospects necessitates different forms of governance arrangements that are more efficient in tackling specific

⁵¹ The EU has put in place two strategies, covering several policies, which are targeted at a 'macro-region': the EU Strategy for the Baltic Sea Region (2010) and for the Danube Region (2010). The European Council invited in 2012 the Commission to present an EU Strategy for the Adriatic and Ionian Region by end 2014, subject to the evaluation of the concept, and in 2013 proposed to work also on the Alpine Region aiming at having a proposal for a strategy in 2015.

⁵² There is no an explicit policy document framing for the Structural Funds (created in 1975), and the Cohesion Funds (created in 1992).

⁵³ The chapter, together with the following one presents the "Second horizon" of the foresight exercise

territorial challenges and promoting territorial cohesion. Europe cannot afford to have areas that are lagging behind and decoupled from modern trends and prospects. At the same time, these territories are the victims of the high levels of institutional fragmentation of Europe. Hence, creating new forms of territorial coalitions would enable areas with geographic specificities to federate their resources across a common development prospects as well as more efficiently tackling their common challenges by pooling their resources, essentially linked with the provision of services of general interests.

106. ***Increasing involvement of citizens in the European policy***, empowering local actors to a higher extent and considering territorial, environmental and socioeconomic issues altogether in an integrated approach. At the same time, an increasing mismatch between social and economic flows and administrative and political boundaries introduce rigidities in service provision, fund allocation and policy building. New planning and territorial cooperation initiatives are needed, open to networks of public and private institutions, and attached to add-hoc geographies (e.g. cross-border regions, mountain zones, coastal zones or islands, river basins, remote or sparsely populated regions ...). Policies should increasingly emerge in the future by the initiative of local communities putting accent on good governance and strategic thinking.

107. ***Enhancing Europeanization of Planning Practices***. The sectoral programmes and incentives are negotiated collectively at the programmatic level among sectoral policies by using a strengthened Multi-Level Governance Framework (illustrated in the box below) and an issue-driven rather than sector-driven approach. The principles for these negotiations should be based on the identification of key development objectives (energy efficiency, fair competition, territorial inclusion, Green and Blue Growth...). This way of proceeding supports a 'governing by provision' attitude from EU policymakers that frames the capacity of local and regional to design appropriate policy interventions and thus deliver the targets agreed at inter-governmental level. Key multi-level governance mechanisms for operationalizing this 'avenue' are asymmetric co-financing and conditionality: higher EU co-financing of local/regional initiatives is dependent on the commitment to higher targets to be delivered.

108. ***A new European Multi-Level Governance Framework to deal with territorial challenges***. Given the scope of challenges, there is a need for a level of government adapted to better face all of them. Strategic planning and the delivery of public policies on economic development, the labour market, mobility and transport, housing, education, water, energy, waste, immigration, cannot be addressed at too local level. Good government and governance structures at a metropolitan level are also considered a key condition for cities' competitiveness. Governance at the metropolitan or city-region level is not confined to national frameworks but can also cross national borders. Different territorial and governance levels have more or less relevance depending on the specific challenges and objectives they have to address. Issues such as water management may be best dealt with at sub-regional or regional level, public transport and research infrastructures may be best addressed at metropolitan or city-regional level, while equality and integration may need a more local approach at neighbourhood level. Given this quest for variety and flexibility, it is increasingly clear that different levels of fixed government structures alone are not well suited to addressing the future challenges in a sustainable way. Moreover, a formal governance system tailored to reduce discrepancies between the de facto city and the de jure city may not necessarily be relevant once operational, given the time required putting new administrative systems into practice. Indeed, adapting government structures to better respond to challenges may be a futile task: not only would the dynamic nature of challenges demand a constant re-adaptation, but their multi-dimensional nature requires responses at different scales

109. ***Coordinated approaches in a multi-level governance framework*** are needed to effectively tackle the challenges of tomorrow. Different government levels will have to play different roles in a multi-scalar governance system. In essence, what is needed is a functional and flexible approach that both respects the principles of subsidiarity and can be adapted to a functional geography and the specificities of different territorial scales. Problems solved at the level closest to the citizens who are able to deal effectively with

them have to be complemented with better coordination at a higher level, to avoid transferring problems from one local level to another, or from the city centre to its periphery. What seems to be increasingly important is the capacity to shift from a *government* to a *governance* mode suitable to the scale of the challenges. Such a governance mode must be capable of integrating formal government structures with more dynamic and flexible governance procedures to cope with challenges that do not respect strict administrative boundaries. Many local authorities already cooperate to provide school buses, manage multimodal transport systems, collect and treat waste, provide water, etc. Functions shared over greater territories may include universities, major transport nodes (e.g. a regional airport), business parks, hospitals, etc.. Such inter-municipal cooperation may be the basis for the creation of the new, more flexible functional urban area governance entities, but even without putting in place such new entities, cooperation may take the form of different city administrations sharing intelligence and policy learning to create human capacity-building focused on addressing common challenges.

110. **Strengthening European territorial planning.** Territorial planning in Europe has become increasingly trans-national. This requires a mandate for Europe for trans-national territorial planning, subject to the principle of subsidiarity. Integrated impact assessments for all significant EU policies and programmes are developed based on and results be better integrated into the planning and management of the programs. Enhanced territorial planning capacity at European level also facilitates the development of an European wide Green Infrastructure to ensure the necessary connection of natural areas to enhance ecosystem services and biodiversity, as well as the interconnection between transport and energy networks

Monitoring Territorial Cohesion

111. The monitoring and analysis at regional (NUTS2, or NUTS3) level of the policy-indicators defined for different policies in reference documents such as Europe 2020 and European Roadmaps is necessary for a more detailed understanding of regional specificities and a more sensitive and effective policy implementation.

112. There is a need to define territorial indicators to monitor most fundamental territorial development and Cohesion trends. Indicators have to be policy-relevant, sound and as simple as possible to be easily understood. Four indicators for monitoring European territorial Cohesion are proposed, complementary to other existing ones (e.g. Population growth and migration, GDP growth by sectors, Transport demand by transport models, Energy demand by different sources, or CO2 emissions). For these indicators, explicit targets for 2030 and 2050 are also suggested.

113. **Depopulation.** A number of areas in Europe will lose population, often from more or less remote rural areas towards large cities in the same region or abroad. Population decrease is not necessarily a negative trend in itself, excepts for regions loosing a high amount of young/active population that migrates to find a job elsewhere. Hardly these regions loosing active population -their most previous asset- will be able to catch up the development level of other regions. It is suggested that no more than 5% of European NUTS3 regions should lose more than 7,5% of their population between 2010 and 2050. This simple indicator is proposed as a proxy to complex phenomena linked to population ageing, low fertility rates, migrations between rural areas and cities, and flows between European regions for labour reasons (e.g. east to west) or residential tourism (north to south).

114. **Regional Economic Gap.** The relative distance in GDP per capita between wealthiest European regions and laggards is a possible indicator of the difference between economic development across European territory. It is proposed that the gap between the GDP per capita of 95th wealthiest NUTS3 in Europe and the 5th poorest NUTS3 in Europe should get reduced at least by 2 between 2010 and 2050. GPD

is not capturing fundamental wellbeing conditions, however, and remains contradictory from economic point of view.

115. **Remoteness.** The 5th Cohesion Report introduced the notion of remoteness in the analysis of regional typologies in Europe. Intermediate and rural regions (as previously defined by the OECD) became remote whenever less than half of their residents could drive to the centre of a city of at least 50 000 inhabitants within 45 minutes⁵⁴. There are currently 209 remote NUTS3 in Europe. The number of remote regions in Europe is proposed as an indicator to monitor general accessibility conditions. It is proposed that by 2050 there would be no more regions in Europe classified as remote. Minimum accessibility is regarded as a necessary condition for economic growth, having a direct impact on the attractiveness of regions for businesses and people.

116. **Land taken.** The progress towards more compact urbanisation and alleviated soil-sealing can be monitored with an indicator based on the total annual land-take in Europe. Artificial land continues to expand in Europe (in the period 2000-2006 at a rate of 920 km² per year). The Roadmap to a Resource Efficient Europe envisages by 2050 a European economy that has grown in a way that respects resource constraints and planetary boundaries, thus contributing to global economic transformation, with all resources are sustainably managed (from raw materials to energy, water, air, land and soil). In this approach, the Commission Staff Working Paper backing up the Roadmap proposes to reach a state of no net land take by 2050, which would then force a mid term target of maximum 800 km² per year in the period 2010-2020. This approach is assumed taken on board.

⁵⁴ Regional Focus 01/2008

ANNEX 1: MAIN REFERENCES

Visions for the European Territory 1968-2014

- A number of visions for the development of the European territory have been developed over the years aiming to provide for the basis for a possible European territorial development policy framing Structural Funds (created in 1975), and then Cohesion Funds (created in 1992). It is fair to say that many of these visions, despite their value, have had a little political influence⁵⁵.
- The Council of Europe, a pan-European organisation created in 1949 was the driving force behind a Community concern with spatial planning: with the creation of **CEMAT** (the European Conference of Ministers responsible for Regional Planning), to organise ongoing coordination of spatial planning among Member States, in 1968; the adoption of the **European Outline Convention**, to provide a legal framework for cross-border cooperation between territorial authorities (Madrid, 1980); and above all, the adoption by ministers of the **European Spatial Planning Charter** (Torremolinos, 1983). This represents a decisive step forward because it provides both for the elaboration of a European structure for territorial planning and for the specific needs of the territories (urban, rural and frontier areas, mountains, islands, etc.) and the need to organise sectoral policies on a territorial basis.
- At the Community level, it was the European Parliament that launched the initiative (based in part on the work done by la CEMAT), particularly through the so-called **Gendebien resolution on a European spatial planning policy**, adopted in 1983; the resolution concerning a **Coordinated spatial planning policy** was adopted in 1990.
- The first territorial analysis of European Development patterns and prospects were developed by the European Commission in the **Europe 2000** (1991)⁵⁶ **Europe 2000+** (1994)⁵⁷ programs and the Compendium of Spatial Planning Systems and Policies in the European Union (1997-2000)⁵⁸ by the DGXVI, now DGREGIO, of the European Commission.
- The **European Spatial Development Prospective** (ESDP) was approved by the Informal Council of EU Ministers responsible for Spatial Planning in 1999. The aim of spatial development policies was to work towards a balanced and sustainable development of the territory of the European Union. In the Ministers' view, what was important was to ensure that the three fundamental goals of European policy are achieved equally in all the regions of the EU: economic and social cohesion; conservation and management of natural resources and the cultural heritage; more balanced

⁵⁵ In 1975 the **European Regional Development Fund** (ERDF) was established aiming to reduce regional disparities. It was only in 1985, with the arrival of the Single Market, the acceleration of European integration, and the Single European Act (1986), that the Community cohesion (or regional) policy was officially launched. **Cohesion funds** were created in the Treaty of Maastricht in 1992. In 1988, when the Structural Funds were reformed, cross-border cooperation became eligible for funding from the ERDF, and the Community cooperation initiative **INTERREG-I** was set up two years later. The first generation of INTERREG programmes was initiated during the programming period 1989-1993 of the EU structural funds. Since then, DGREGIO has been studying European spatial development patterns and publishing monitoring reports on the evolution of European Cohesion.

⁵⁶ *Europe 2000: Outlook for the development of the Community's territory* (EC, 1991) which proposed structuring European spatial planning around major sectoral initiatives whose territorial impact would extend beyond national frontiers: transport, telecommunications, energy and the environment. This approach was original in that it was based on an analysis of groups of regions at the European level (urban, rural, frontier areas, etc.) and not by Member State.

⁵⁷ *Europe 2000+, Cooperation for European territorial development* (EC, 1994), which defined the macro-regional areas for cooperation and presented a long-term vision and prospects for the coordinated development of the territory of the EU

⁵⁸ *Compendium of spatial planning systems and policies in the European Union* (EC, 1997-2000) analysed the institutional systems for territorial development and land use. It highlighted the diversity of concepts and practice among the Member States

competitiveness of the European territory. The key policy aims presented were based on achieving a polycentric and balanced territorial development of the European Union⁵⁹.

- Following the ESDP approval, the **Study Program on Spatial Planning (SPSP)** Program was launched, and then **European Spatial Planning Observatory Network (ESPON)** Program was created (currently renamed as European Observation Network for Territorial Development and Cohesion).
- Since the year 2000, **ESPON** has been conducting a number of research projects that have largely contributed to a knowledge-base on territorial dynamics. ESPON has the role to support policy development in relation to EU Cohesion Policy. The programme provides pan-European evidence and knowledge about European territorial structures, trends, perspectives and policy impacts which enable comparisons amongst regions and cities. This forms a basis for finding additional opportunities for growth as well as challenges that need attention in a world where the larger territorial context is an inevitable reality. For a decade ESPON has played this key role within EU Cohesion Policy in support of policy development providing comparable pan-European evidence, analyses and scenarios on territorial dynamics that help regions, cities and larger territories in taking evidence-based decisions on their future development.
- In the **Lisbon Treaty (2007)**, states Article 3 that the Union shall promote economic, social and territorial cohesion, and solidarity among Member States. It shall respect shall ensure that Europe's cultural heritage is safeguarded and enhanced. In 2007 the Commission launched a public debate on territorial cohesion by issuing the **Green Paper on Territorial Cohesion**. The debate showed that “territorial cohesion” is largely associated with an integrated approach to development, entailing the better coordination of public policies, taking better account of territorial impacts, improved multilevel governance and partnership, the promotion of European territorial cooperation as a clear EU asset, and a reinforced evidence base to improve territorial knowledge⁶⁰. “Territorial Cohesion” can be understood as achieving a balanced, inclusive and sustainable development of territories, making value of their specific potential, through an integrated approach based on strategic cooperation and networking between territories multi-level governance and broad partnership coordination of policies applicable to these territories.

⁵⁹ Policy-Aims of the ESDP

- Polycentric and Balanced Spatial Development in the EU
- Dynamic Attractive and Competitive Cities and Urbanised Regions
- Indigenous Development
- Diverse and Productive Rural Areas
- Urban-Rural Partnership
- An Integrated Approach for Improved Transport Links and Access to Knowledge
- Polycentric Development Model: A Basis for Better Accessibility
- Efficient and Sustainable Use of the Infrastructure
- Diffusion of Innovation and Knowledge
- Natural and Cultural Heritage as a Development Asset
- Preservation and Development of the Natural Heritage
- Water Resource Management – a Special Challenge for Spatial Development
- Creative Management of Cultural Landscapes
- Creative Management of the Cultural Heritage

⁶⁰ Territorial Cohesion according to the Green Paper

- Concentration and density i.e. better exploiting regional potential and territorial capital
- Connecting territories: overcoming distance e.g. access to services of general economic interest or to energy in other words integrating the economy of places with the economy of flows;
- Cooperation: overcoming division i.e. promoting co-operation cross boundaries but also better consistency between various EU and national policies with a territorial impact, both horizontally and vertically;
- Regions with specific geographical features i.e. policy differentiation to accommodate the specific features of different territories, including regions with some geographic development challenges.

- The European Commission asked Fabrizio Barca to prepare an independent report analysing the recent practice and achievements of EU Cohesion Policy while proposing various policy steps to redirect it in view of the 2014-2020 period. This report was published in April 2009. Among various proposals, Barca made a strong case for basing future EU regional policy programmes and operations on a “**place-based approach**”, a notion previously explored by the Organisation for Economic Cooperation and Development (OECD).
- The ‘**Europe 2020**’ strategy is the overarching European policy document for the next decade of economic growth. Its main focus is on economic development, in particular the recovery for the 2008 crisis. To monitor the progress made and quantify the objectives to be met by 2020, the Commission has proposed the following ‘Europe 2020’ headline indicators and targets: 75% of the population aged 20-64 should be employed; 3% of the EU’s GDP should be invested in R&D; the “20/20/20” climate/energy targets should be met (including an increase to 30% reduction of emissions if the conditions are right); the share of early school leavers should be under 10% and at least 40% of the younger generation should have a tertiary degree. 20 million less people should be at risk of poverty⁶¹.
- Based on the Europe 2020 Strategy (2010) and the outcomes of the debate articulated around the Green Paper on Territorial Cohesion (2008) a **Territorial Agenda 2020** was adopted (2011). The first priority was, following ESPD, “Promoting polycentric and balanced territorial development as an important precondition of territorial cohesion and a strong factor of territorial efficiency”⁶². The TA 2020, adopted by the ministers responsible for spatial planning and territorial development in the EU member states, sheds further light on the notion of the place-based approach: “We consider that the place-based approach to policy making contributes to territorial cohesion. Based on the principles of horizontal coordination, evidence-informed policy making and integrated functional area development, it implements the subsidiarity principle through a multilevel governance approach. It aims to unleash territorial potential through development strategies based on local and regional knowledge of needs, and building on the specific assets and factors which contribute to the competitiveness of places. Places can utilize their territorial capital to realise optimal solutions for long-term development, and contribute in this way to the achievement of the ‘Europe 2020’ strategy objectives.”

⁶¹ Priorities of the European 2020

- 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.

⁶² Priorities of the TA2020

- Promoting polycentric and balanced territorial development as an important precondition of territorial cohesion and a strong factor of territorial efficiency.
- Encouraging integrated development in cities, rural and specific regions to foster synergies and better exploit local territorial assets.
- Territorial integration in cross-border and transnational functional regions as a key factor in global competition facilitating better utilization of development potentials and the protection of the natural environment.
- Ensuring global competitiveness of the regions based on strong local economies as a key factor in global competition preventing the drain of human capital and reducing vulnerability to external development shocks.
- Improving territorial connectivity for individuals, communities and enterprises as an important precondition of territorial cohesion (e.g. services of general interest), a strong factor for territorial competitiveness and an essential condition for sustainable development.
- Managing and connecting ecological, landscape and cultural values of regions, including joint risk management as an essential condition for long-term sustainable development.

- In 2011, the Commission adopted Roadmaps in the environmental, energy and transport domains to support the progress towards the thematic objectives and headline targets established in the Europe 2020 Strategy with a long-term view: Roadmap to resource efficient Europe (COM(2011) 571 Final); Roadmap for moving to a competitive low carbon economy in 2050 (DG Clima, COM(2011) 112 final); Energy Roadmap 2050 (DG Energy, COM(2011) 885 Final); Roadmap to a Single European Transport Area – Transport White Paper (DG Move, COM(2011) 144 Final)
- Several territorial visions for the future have also been carried out at local, regional and macro-regional scale in Europe. All of them have the development of polycentric urban structures as the main strategic approach. The macro-regional spheres of transnational cooperation constitute excellent laboratories for spatial planning and governance such as the Baltic Sea region exemplifies.
- The Vision presented in this document was developed from 2011 until 2014, a period of crisis; the expectations and concerns of Europeans changed radically, the eurozone was under an imminent risk of fragmentation and the political cohesion of the European Union was in danger.

ANNEX 2: TABLES, FIGURES AND MAPS

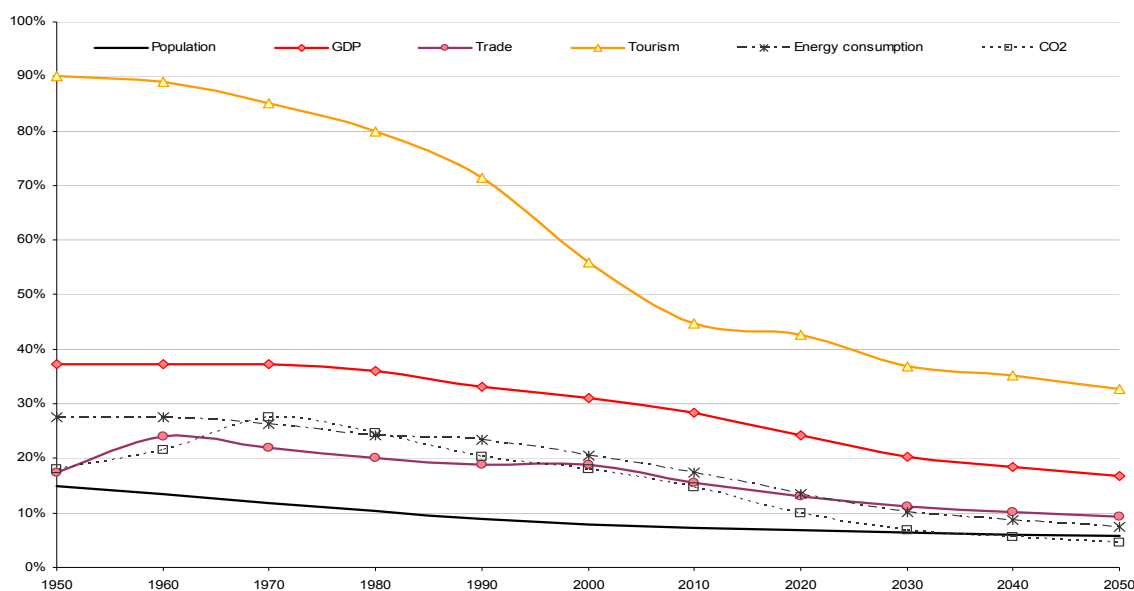
Europe in the World 1950-2050

Table 1. World Framework 1950-2010 and projections 2010-2050 – Table of exogenous variables

Indicator	1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050
World Population (millions of people)	2.531	3.039	3.708	4.473	5.308	6.125	6.910	7.670	8.323	8.889	9.214
World Urban Population (% over total population)	29%	33%	36%	39%	43%	46%	50%	55%	59%	64%	69%
World illiteracy rate (% of population 15+)	44%	41%	37%	30%	24%	18%	17%	14%	11%	9%	7%
World Gini Coefficient (Income Disparities)	0,63	0,64	0,65	0,66	0,66	0,66	0,64	0,63	0,63	0,62	0,60
World GDP (1000 millions of 2010 €)	4.501	7.422	13.535	19.367	26.411	34.214	43.338	60.565	84.638	106.888	134.986
World total trade (goods& services in 1000 million €)	125	178	479	2.250	5.625	13.027	19.947	36.060	65.189	100.272	154.236
Global seaborne traffic (billion tone-km)	4.862	7.197	10.654	16.777	16.440	22.927	32.746	48.472	69.707	100.246	144.163
Global air traffic (billion RPKs)	226	368	600	1.100	2.100	3.381	4.621	7.491	12.145	19.688	31.918
World Tourism (million overnight visitors per year)	25	64	109	170	319	560	940	1.281	1.746	2.379	3.241
World energy consumption (MTOE)	2.900	3.754	4.884	6.469	7.192	8.441	10.182	13.442	17.747	20.758	24.280
World CO2 emissions (million tones)	10.000	11.802	14.908	18.990	21.977	24.224	29.905	38.875	50.537	56.757	63.741
Real crude oil price (€2010 per barrel)	13	12	9	82	33	30	67	108	121	130	138

Source: PASH+ foresight model based on various sources (UNDESA, UNESCO, World Bank, UNCTAD, DRAWRY, AIRBUS, BOEING, WTO, IEA, BP).

Figure 1. European evolution in relation to the rest of the World 1950-2050⁶³
(European share at World level)



Source: Multipoles, MASST, SASI, MOSAIC, METRONAMICA and PASH+

⁶³ Europe is associated to the ESPON area

European Baseline 2010-2030

Table 2. Key Trends at European Level

Baseline Trend	Temporal Evolution	Territorial Implications
More Stable Population. Depopulation of Eastern rural regions	From 514 million inhabitants in 2010 to 530 in 2030 and 539 in 2050. Fertility rate increases from 1,61 to 1,66 in 2030.	Many Eastern rural regions suffer population decline while large and capital cities grow because of internal migration, taking advantage of agglomeration economies.
Aging across Europe	Old-age Dependency Ratio (ODR) grows from 26% on average in 2010, to 39% in 2030 (219 millions of elderly).	Ageing European population is general in Europe, except in large cosmopolitan cities and regions attracting young skilled people. Increases in retiring age are likely (e.g. up to 70 years old)
Increasing Migrations. Labour migrations East-West (and probably South-North).	1,21 million immigrants per year arriving from outside Europe by 2030. Total cumulated migration in Europe (internal and external) up to 38 million between 2010-2030.	More mobility because of temporary labour migration and personal visits. More diversified migration purposes, from labour to leisure and tourism, health care and education. Increasing attraction of large cities in front of rural regions.
Average economic growth at a moderate, not marginal, level	1,89% annual growth up to 2030. Economic growth at different speeds. 45 regions grow at less than 1% yearly.	Increasingly different paths to economic recovery across regions. Marginal economic growth is not related to productivity gains in Southern and Eastern regions, while higher growth related to productivity in central regions.
Divergent economies, with higher productivity gaps between the core and peripheral regions	From coefficient of variation 0,50 in 2008 to 0,60 in 2030	Increasing disparities between core regions of Europe and several peripheries (Southern, Eastern).
More jobs being created everywhere, with lower salaries in less developed regions.	Employment annual growth of 1,58%. It grows at a sustained rate in Europe, meaning that large parts of the recovery for the crisis come from job creation and lower salaries, instead of productivity gains.	Labour markets are reformed in Southern European countries and more jobs are generated even with low economic growth. Increase in social disparities also because the likely reduction of social public expenditures, that may hit specific zones and neighbourhoods.
Reindustrialisation of the economy, with balanced employment growth in manufacture and services.	Jobs in manufacture grow at slightly under rates of service employment (1,63% services, and 1,38% industry).	Technological innovation concentrated only in some sectors and regions. Increasing dependency of more expensive energy
Growth in long-distance and intercontinental traffic.	Polarisation of global accessibility in regions having intercontinental transport services in airports and ports.	Continuous growth of long-distance and intercontinental traffics, and increasing share of road in inland transport. Polarised development attached to global transport nodes (e.g. intercontinental airports and ports).
Accessibility changes influenced by other factors than new infrastructure.	Population and economic changes, as well as increasing transport costs heavily influence accessibility within Europe. Road and air becoming the dominant modes. Rail modal share maintained at 6% in 2030 for passengers, and below 7% for freight (12,6% in 1995, 10% in 2009).	Limited territorial integration, with few passenger and freight cross-border flows. Polarised development in transportation nodes well connected globally, in general located near larger metropolis
Expansive land consumption, producing more hybrid urban-rural geographies	More specialised and segregated uses in large metropolitan areas, especially in Southern and Eastern regions with weakest planning traditions.	Increasing low-dense urbanisation, with different development patterns across territories. Relaxed planning regulations in Southern European countries in coastal and touristic zones.
Reduction on Green-House Emissions in more advanced industrial economies	Transport emissions related emissions reduced 17,2% by 2030 because of a combination of lower economic growth and the use of more environmentally friendly vehicles and energy sources.	Decreasing CO2 emissions but targets are not met. Environmental regulations are relaxed in less developed regions.

Source: Multipoles, MASST, SASI, MOSAIC, METRONAMICA and PASH+

Exploratory Scenarios 2030

Table 3. Policy Assumptions

Policies	BASELINE	A Scenario	B Scenario	C Scenario
Demographic policies	Continuation of actual trends	Lowered support to natality and families	Continuation of actual trends, as in Baseline	Public support to natality and families.
Migration policies	Continuation of actual trends	Openness to migrants from outside Europe	Relative openness	More strict immigration policies
Monetary policies	In Western European countries, stability of interest rates, ULC, exchange rates, inflation; Progressive convergence of Eastern EU towards Western European Countries values Decrease of interest on bonds: end of speculation periods			
Fiscal policies	Increase of tax rates in the Western and Eastern Countries. Debt/GDP remains constant	Slow tendency towards stability pact: 60% of Debt/GDP. Decrease of public expenditure growth rate especially in vicious countries.	Debt/GDP remains constant	Slow divergence from stability pact. Slight increase of public expenditure growth rate
Transport Policies	0,8% of European GDP invested in transport infrastructure by 2030 ⁶⁴ , mostly in long distance infrastructure (€1.970Bn 2013-2030). Slightly reduced modal allocation of investments to rail, and slightly increased to airports and ports. Single European Transport area fully developed for intra-Europe transport	0,6% of European GDP invested in transport infrastructure by 2030, mostly in long-distance infrastructure (€1.630Bn 2013-2030) Modal allocation increasing in air and maritime, and decreasing in rail European transport area opened to global competition. ITS deployment in road mode reduces costs by 5%. Reduced subsidies to rail.	1,0% of European GDP invested in transport infrastructure by 2030, mostly in medium distance infrastructure (€2.320Bn 2013-2030) Modal allocation increasingly rail based Single European Transport area fully developed for intra-Europe transport Pricing and taxation as in baseline	0,7% of European GDP invested in transport infrastructure by 2030, mostly in short distance infrastructure (€1.980Bn 2013-2030). Modal allocation focussed on collective modes and urban public transport Slow liberalisation and integration of the European transport market Road and air taxation causes 5% cost increases Rail and public transport subsidies
Energy policies	Fossil fuels remain important. Emissions reduced but targets are not met.	Increased efficiency of fossil fuels, some RES, emergence of CCS. Targets partially met.	High development of centralised RES and nuclear. Targets partially met.	Decentralised RES. Lower energy consumption. Targets met.
Environmental policies	Continuation of existing environmental management trends Euro-standards ⁶⁵ regulation drops vehicle emissions to 100gr/km by 2030, (140gr/km in 2009)	Environmental protection focussed on keeping standards of environmental quality for air and water. Technologic optimism. Euro-standards drop vehicle emissions a 10% respect to baseline	Protection and management of rural areas as open spaces for leisure and environmental safety. Strong mitigation. Strict public regulations. Euro-standards drop vehicle emissions by 5% respect to baseline	Limits in both use intensity and quality standards and land occupation. Mixed Focus on adaptation. Euro-standards drop vehicle emissions by 20% respect to baseline
Cohesion policies	Budget kept constant. Allocation among regions in 2007-2013 as 2000-2007 Limited and gradual reforms favouring efficiency with no major political change.	Half of the present budget. Allocation among regions in 2007-2013 as 2000-2007 Territorial cross-border cooperation reinforced as well as with Neighbouring countries and the rest of the World. Productive investments in neighbouring countries.	Budget kept constant. Allocation among regions in 2007-2013 as 2000-2007 Thematic objectives redefined favouring urban-oriented policies and innovative urban actions. Strict-land use instruments in vulnerable areas	Budget doubled. Regions type C get 2/3 of the budget, Type B 1/3 Integrated territorial investments and community-led local development reinforced. Place-based focus promoting endogenous development.
Agricultural policy	Limited reform of the CAP	Budget reduced and focussed on subsidies to increase the sector productivity	Limited reform of the CAP. Higher emphasis on landscape management	Full integration of agricultural and environmental policies in their territorial dimension through cohesion policy, particularly pillar II.

⁶⁴ General assumption for all scenarios on European transport investment: 0,9% in 1995; 1,2% in 2007; 0,6% in 2015

⁶⁵ Regulation on transport vehicles environmental performance

Table 4. Territorial strategies associated to the Exploratory Scenarios

	BASELINE	A Scenario	B Scenario	C Scenario
Spatial distribution of population and economic growth (and territorial governance)	No relevant modification on actual spatial patterns	Relative accessibility and connectivity to international transport networks and agglomeration economies attract growth, following spontaneous market tendencies. Global cities, mostly MEGAS grow bigger	Large cities attract both more people and activities because effective public policies promoting them at National scale. Internal migrations from sparsely populated areas to urban centres	Medium-size cities and towns attract people based on their cultural and environmental quality, and strong public policies and incentives. Change in consumer behaviour favouring proximity and self-sufficiency. Intense decentralisation at local and regional level. Limited external migrations

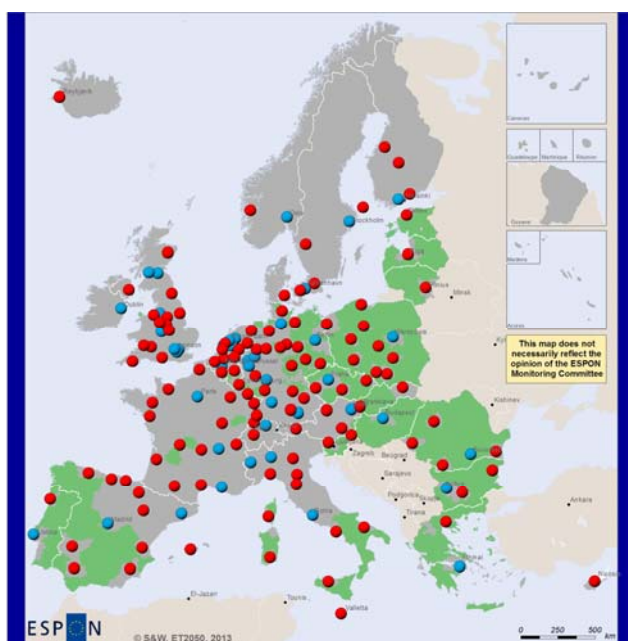


Illustration 9 Areas promoted in the A (blue), B (red) and C (green) Scenarios

Table 5. Main Results

Indicator	2010	2030			
		Scenario A	Scenario B	Scenario C	Baseline 2030
Total Fertility Rate (TFR) (births per woman)	1,61	1,50	1,66	1,80	1,66
Life Expectancy at birth (years, average male-female)	80,0	83,5	83,5	83,5	83,5
Extra-EU yearly migratory flows (million immigrants arriving yearly)	0,73	1,35	1,75	1,00	1,21
Total cumulated migrants (including intra and extra EU migrants)	-	39,6	38,8	37,2	37,9
Total population (millions of inhabitants)	514,1	527,7	530,8	531,6	530,2
Old-age dependency ratio (ODR) (>64 / 16-64; weighted average of ODR by NUTS2 population)	26%	38,8%	38,9%	39,1%	38,9%
GDP growth (% annual average growth)	-	2,22%	2,31%	1,82%	1,89%
GDP per capita (€2010 per inhabitant)	23.335	34.104	34.121	31.049	31.845
Regional divergence (coefficient of variation of per capita GDP)	0,503	0,598	0,595	0,592	0,601
Total employment (% annual average growth)	-	1,92%	1,96%	1,55%	1,58%
Manufacturing employment (% annual average growth)	-	2,12%	1,66%	1,08%	1,38%
Services employment (% annual average growth)	-	1,86%	2,04%	1,67%	1,63%
Transport demand (increase in pax-km)	-	34,3%	34,8%	31,6%	39,0%
Time spent in travelling (increase in hours)	-	23,3%	34,5%	32,1%	41,7%
Cost of transport (increase in euros)	-	29,7%	34,9%	29,0%	39,3%
Land-take (average yearly km2 of new artificial land)	1208	898	879	728	1080
CO2 due to transport (increase in tonnes)	-	-14,8%	-20,6%	-48,6%	-17,2%
Total CO2 (increase in tonnes)	-	N/A	N/A	N/A	-28,9%

Source: Multipoles, MASST, MOSAIC, METRONAMICA.

Exploratory Scenarios and Variants 2050

Table 6 - Scenario variants: territorial orientations and extreme framework conditions

Territorial orientation of Scenarios	Framework conditions			
	Baseline	1 Economic decline	2 Technical advance	3 Energy / Climate impacts
Promotion of metropolitan areas	A	A1	A2	A3
Promotion of large European cities	B	B1	B2	B3
Promotion of peripheral regions and medium cities	C	C1	C2	C3

Table 7 - Main Assumptions for trends and policies

	2010	2050			
		Scenarios A1, B1, C1	Scenarios A2, B2, C2	Scenarios A3, B3, C3	Reference Scenario
Extra-EU yearly migratory flows (million immigrants arriving yearly)	0,73	1,10	1,10	1,10	1,10
Total population (millions of inhabitants)	514,1	542,0	542,0	542,0	542,0
GDP growth, without generative effects (% annual average growth)	-	0,62%	1,50%	1,50%	1,50%
GDP per worker, without generative effects (€2010 per worker)	69.700	99.400	145.500	99.400	99.400
Fuel Price (€2010 per litre)	1,7	3,0	3,0	10,2	3,0
Structural Funds (% of GDP)	0,4%	0,4%	0,4%	0,4%	0,4%

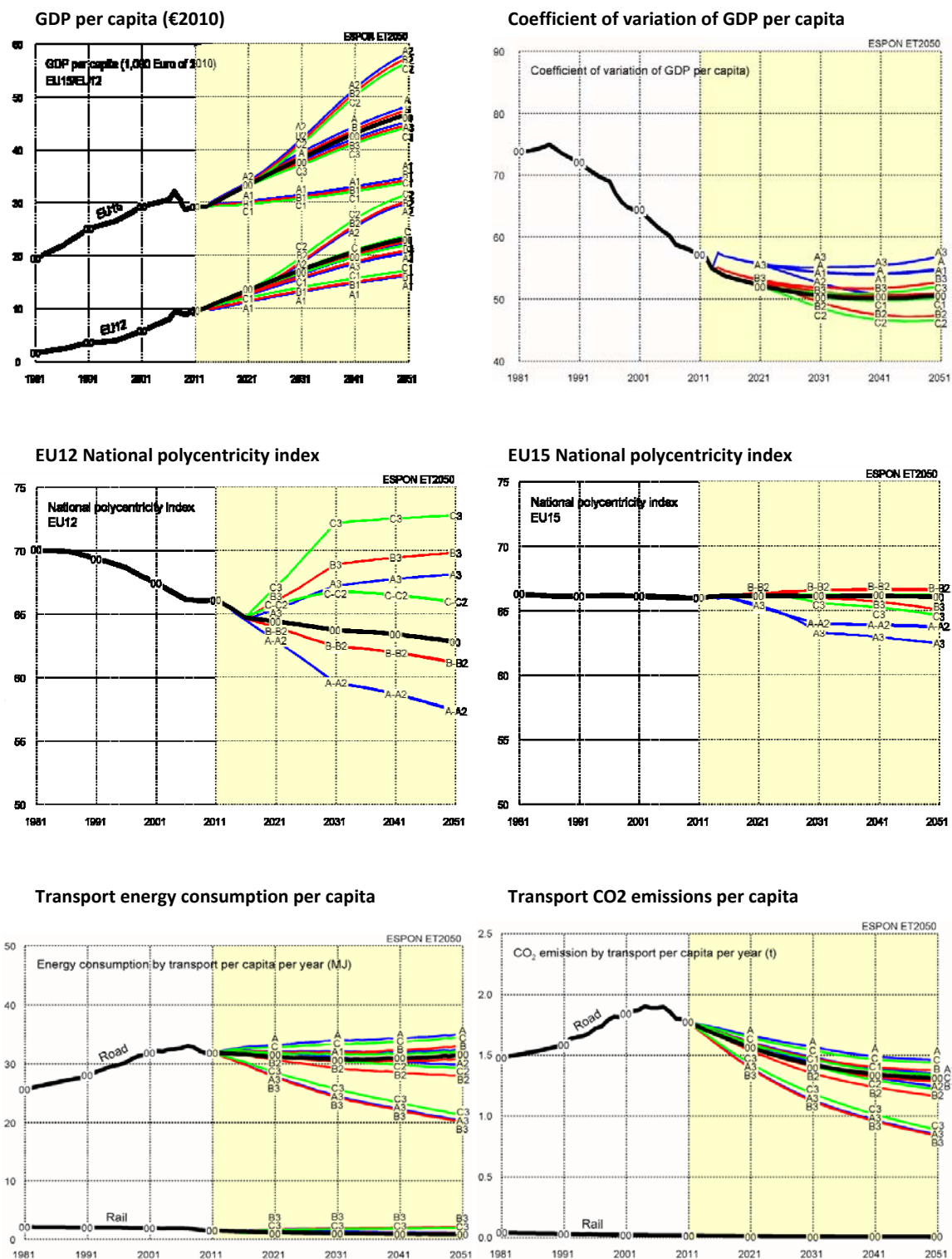
Source: SASI

Table 8 - Results for main indicators

	Reference Scenario	2050											
		A	B	C	A1	B1	C1	A2	B2	C2	A3	B3	C3
GDP per capita 2050	42.896	43.999	43.464	43.080	31.639	31.255	30.979	53.552	52.918	52.432	41.197	40.808	40.569
GDP growth (% annual change in GDP per capita)	1,38	1,45	1,42	1,39	0,57	0,54	0,52	1,98	1,94	1,92	1,27	1,25	1,23
Regional divergence (coefficient of variation of per capita GDP)	50,6	54,8	51	50,3	54,6	50,8	50,2	51	47,3	46,6	56,8	52,7	52,1
National polycentricity (polycentricity index ESPON 1.1.1)	65,1	62,1	65,2	65,7	62,1	65,2	65,7	62,1	65,3	65,8	63,2	65,6	65,8
Energy Use of transport (MJ/capita/year)	31	34,7	32,7	34	31,9	30,5	31,6	29,5	27,6	28,8	21,3	21,3	22,2
CO2 emissions from transport (tones/capita/year)	1,26	1,41	1,33	1,39	1,3	1,24	1,29	1,2	1,12	1,17	0,82	0,82	0,86

Source: SASI

Figure 2. Main Results for Scenario Variants



Source: SASI

Monitoring Indicators and Policy Targets

Table 8. Proposed Main Targets for the EU Territorial Vision

	Topic	Indicator	Target proposed by	Indicator value in 2010	Value for target and time horizon
1	Population change	% of NUTS3 losing population	ESPON ET2050	-	95% of NUTS3 regions will not lose population beyond 7,5% by 2050
2	Regional Economic Gap	Gap in GDP per capita (percentile 95 / percentile 5)	ESPON ET2050	8,0 in 2010	To reduce the gap by 50% by 2050
3	Sufficient Accessibility	Number of remote NUTS3 regions in Europe	ESPON ET2050	209 remote NUTS3 in 2010	No remote NUTS3 by 2050
4	Minimum Land-taken	Annual land take in km2	EU Resource Efficient Roadmap 2050	920km2 sealed yearly in 2010	800km2 by 2020 0km by 2050

Table 9. Targets adopted by European Roadmaps

Topic	Source	Target	Unit	Target Year	2010 - 2050 path to target				
					2010	2015	2020	2030	2050
SOCIAL TARGETS									
Health	European Innovation Partnership on Active and Healthy Ageing	Increase healthy life for everyone in Europe by an average of two years	Healthy life years	2020	62	63	64	66	70
Education	EU2020	Reducing school drop-out rates below 10% by 2020	% of population aged 18-24	2020	14,1%	12,5%	10,0%	8%	7%
Education	EU2020	At least 40% of 30-34 year old completed tertiary education	% of population aged 30-34	2020	33,5%	35%	40,0%	45%	50%
Education	Education and training benchmarks to 2020	At least 95% of children between 4 and the age for starting compulsory primary education should participate in early childhood education	% of population aged 4-6	2020	92,3%	93,0%	95,0%	97%	100%
Education	Education and training benchmarks to 2020	The share of 15-years olds with insufficient abilities in reading, mathematics and science should be less than 15%	% of population aged 15	2020	20%	17,5%	15,0%	10%	0%
Education	Education and training benchmarks to 2020	an average of at least 15% of adults (age group 25-64) should participate in lifelong learning	% of population aged 25-64	2020	9,3%	12%	15,0%	20%	30%
Poverty / Social exclusion	EU2020	At least 20 million fewer people in or at risk of poverty and social exclusion by 2020	Thousands of people	2020	115.716	110.000	95.000	80.000	70.000
Social disparities	ESPON ET2050	To achieve an EU28 GINI coefficient by 2050 below to the lowest national GINI coefficient of an EU MS before the crisis (23.5, Denmark 2006)	GINI coefficient for EU	2050	30,5	30,5	27	25	20
ECONOMIC TARGETS									
Employment	EU2020	75% of the 20-64 year-olds to be employed	% of population aged 20-64	2020	68,6%	70%	75,0%	78%	80%
R&D / innovation	EU2020	From 1,8% in 2005 to 3% of the EU's GDP (public and private combined) to be invested in R&D	% of GDP	2020	2,0%	2,4%	3,0%	3,5%	4,0%
Eurozone members	Maastricht Treaty	All Member States except from UK and Denmark are obliged to join the Eurozone as they fulfil convergence criteria. Latvia will join in Jan 1 st 2014 and Lithuania in Jan 1 st 2015.	Number of States integrating the Eurozone	All times	17	19	24	28	28
Inflation (Eurozone)	ECB	Maximum 2%	Number of Eurozone members fulfilling	All times	11	11	22	28	28
Inflation (Eurozone)	Maastricht Treaty	Not more than 1,5 percentage points above the rate of the three best performing Member States	Number of Eurozone members fulfilling	All times	16	19	24	28	28
Government deficit (Eurozone)	Maastricht Treaty	Maximum 3.0% of GDP	Number of Eurozone members fulfilling	All times	5	10	20	28	28
Government debt (Eurozone)	Maastricht Treaty	Maximum 60% of GDP	Number of Eurozone members fulfilling	All times	14	16	18	23	28
TERRITORIAL TARGETS									
Accessibility	ESPON ET2050	At least 50% population in all European NUTS3 can access a 50.000 inh city within 45 minutes drive by 2050. No NUTS3 regions in Europe classified as remote by 2050 (<i>Dijkstra&Poelman definition</i>)	Number of NUTS3 regions classified as remote	2050	165	145	110	50	0
Regional Disparities	ESPON ET2050	To achieve a GINI coefficient by 2050 equal to 20	GINI index applied to average GDP per capita at regional level	2050	28	27	25	23	20
Regional GAP	ESPON ET2050	Difference between largest and lowest performing EU country in RGA Disposable Income in PPS lowered to 1/3	Max/Min Real gross adjusted disposable household income per head	2050	3,13	2,95	2,67	2,10	1,04

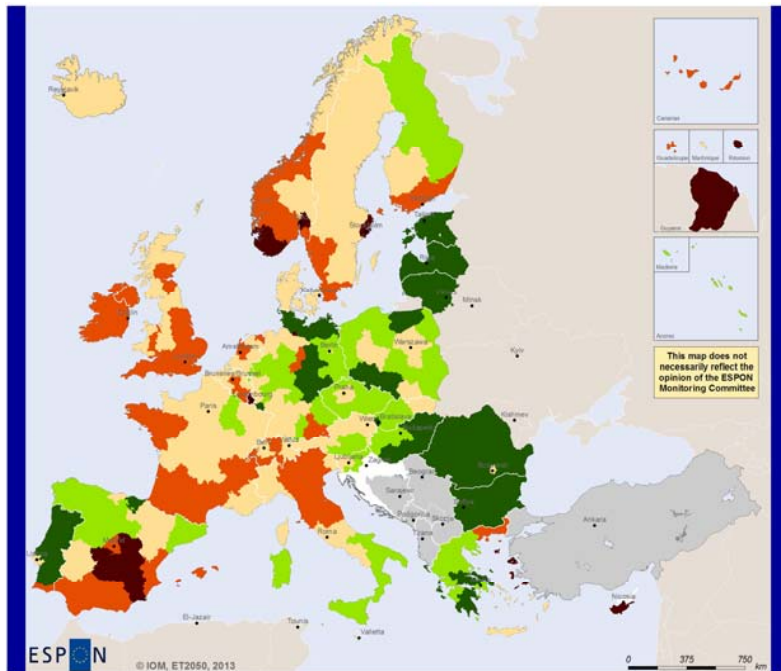
Topic	Source	Target	Unit	Target Year	2010 - 2050 path to target				
					2010	2015	2020	2030	2050
Land use	The Roadmap to a Resource Efficient Europe - "The Roadmap" (Proposed, yet not adopted target)	Average annual land take, from additional 920 km2 per year in 2000-2006, to 800km2 in 2020 and 0km2 by 2050	New artificial land in km2	2020 - 2050	920	850	800	550	0
Land use	The Roadmap to a Resource Efficient Europe - "The Roadmap" (Proposed, yet not adopted target)	At least 10% of the marine EU area is covered by a coherent network of (Marine Protected Areas) MPAs	% of protected marine area	2020	2%	5%	10%	20%	25%
ENERGY TARGETS									
Total GHG emissions	EU2020 Roadmap for moving to a competitive low carbon economy in 2050 (Low-Carbon RM 2050)	GHG emissions 20% lower in 2020 than in 1990 (or 30% if a agreement can be achieved to follow Kyoto) (EU2020). GHG 80% lower in 2050 than in 1990 (40% in 2030, 60% in 2040) (Roadmap)	Index 1990=100	2020 2050	85	80	75	60	20
GHG by sectors: Power generation	Low-Carbon RM 2050	GHG 95% lower in 2050 than in 1990	Index 1990=100	2050	93	80	65	40	5
GHG by sectors: industry	Low-Carbon RM 2050	GHG 85% lower in 2050 than in 1990	Index 1990=100	2050	80	78	76	67	15
GHG by sectors: Transport	Transport White Paper 2011 (WP2011) & RM2050	Transport emissions (including CO2 aviation, excl. maritime) 60% lower in 2050 in relation 1990's (Stabilisation of air emissions by 2020 (carbon neutral growth) and 50% reduction in 2050 compared to 2005 (IATA); CO2 emissions from maritime transport should be cut by 40% (if feasible 50%) by 2050, compared to 2005 levels)	Index 1990=100	2050	130	125	120	105	40
GHG by sectors: Residential	Low-Carbon RM 2050	GHG 90% lower in 2050 than in 1990	Index 1990=100	2050	88	80	72	55	10
GHG by sectors: Agriculture	Low-Carbon RM 2050	GHG 45% lower in 2050 than in 1990	Index 1990=100	2050	80	75	70	63	55
GHG by sectors: other	Low-Carbon RM 2050	GHG 75% lower in 2050 than in 1990	Index 1990=100	2050	70	50	38	28	25
Primary energy consumption	EU2020 Low-Carbon RM 2050	20% increase in energy efficiency by 2020, i.e. 20% decrease in primary energy consumption by 2020 (EU2020) 30% decrease in primary energy consumption by 2050 respect to 2005 (Roadmap)	1000 tones of oil equivalent (kTOE)	2020 2050	1.646.839	1550000	1.474.000	1290000	884.400
Renewable Energy sources	EU2020	20% of total gross energy consumption from renewables in 2020	% of RES	2020	12,5%	15%	20,0%	36,1%	75,0%
Renewable Energy sources in transport	Renewable Energy Roadmap Communication by the EC, 2007	10% of transport energy from renewables in 2020	% of RES	2020	4,7%	7%	10%	17%	35%
Renewable Energy sources in transport	Regulation 443/2009 h	New vehicle car emissions: 95 g CO2/km target for 2020	gr CO2 / km	2020	140	130	95	60	30
Renewable Energy sources in transport	Transport White Paper 2011	40% use of sustainable fuel used in aviation (IATA thinks a 6% share of sustainable 2nd generation biofuels is achievable by 2020; Boeing supports a target of 1% of global aviation fuels by 2015)	% of sustainable fuel	2050	0%	1%	6%	20%	40%
Renewable Energy sources in transport	Transport White Paper 2011	40% cut in fuel emissions of the shipping industry	% of sustainable fuel	2050	5%	10%	17,5%	30%	40%
TRANSPORT TARGETS									
Passenger transport modal	Transport White Paper 2011	50% medium distance passenger transport shift to rail by 2050.	% rail in passenger-km	2050	8,30%	9,40%	12%	20%	50%
Freight transport modal shift	Transport White Paper 2011	30% freight transport >300km shift to rail or waterborne. 50% by 2050	% (rail + waterborne) in tonne-kilometre	2030 2050	15%	18%	21%	30%	50%
Trans European Networks TEN-T	Transport White Paper 2011	Multi-modal TEN-T core network by 2030	Km of motorways in core network	2030	29.950	31.000	33.000	35.899	35.899
Trans European Networks TEN-T	Transport White Paper 2011	To triple the length of high-speed rail network by 2030. To complete a European high-speed rail network by 2050	Km of HSR	2030 2050	6.602	7.343	9.743	18.000	22.000
Trans European Networks TEN-T	Transport White Paper 2011	All core network airports connected to rail network by 2050, preferably by high-speed rail	Core airports connected to rail	2050	15	17	20	25	37
Trans European Networks TEN-T	Transport White Paper 2011	All core seaports sufficiently connected to the rail freight and, where possible, inland waterway system.	Core port connected to rail with adequate standards	2050	25	27	35	65	83
Clean urban transport	Transport White Paper 2011	Lower 50% the use of "conventionally-fueled" cars in urban transport by 2030 and 0% use of "conventionally-fueled" cars in urban transport by 2050	% Share of unconventionally fuelled cars	2030 2050	5%	10%	20%	50%	100%
Clean urban transport	Transport White Paper 2011	CO2 free logistics in cities by 2030	% Share of unconventionally fuelled delivery vehicles	2050	0%	5%	15%	50%	100%

Topic	Source	Target	Unit	Target Year	2010 - 2050 path to target				
					2010	2015	2020	2030	2050
Road fatalities	Transport White Paper 2011	By 2020, 50% fatalities in road transport compared to 2010. Close to zero fatalities in road transport by 2050.	Fatalities per million people	2030 2050	62	45	31	15	0
ENVIRONMENTAL TARGETS									
Air pollution	Roadmap to a Resource Efficient Europe (EC, 2011)	Concentrations of Particulate Matter (PM10) in ambient air, not exceeding 50µg/m3 per 24 hours more than 35 times a year	Number of PM10 events with concentration > 50µg/m3 per 24 hours, per year	2020	45	40	35	20	0
Air pollution	Thematic Strategy on Air Pollution	47% reduction in loss of life expectancy as a result of exposure to particulate matter	% reduction respect to 2005	2020	10%	25%	47%	75%	100%
Air pollution	Thematic Strategy on Air Pollution	10 % reduction in acute mortalities from exposure to ozone	% reduction respect to 2005	2020	5%	7.5%	10%	20%	60%
Air pollution	Thematic Strategy on Air Pollution	Reduction in excess acid deposition of 74% in forest areas	% reduction respect to 2005	2020	35%	55%	74%	95%	100%
Air pollution	Thematic Strategy on Air Pollution	Reduction in excess acid deposition of 39% in surface freshwater areas	% reduction respect to 2005	2020	10%	25%	39%	70%	100%
Air pollution	Thematic Strategy on Air Pollution	43% reduction in areas or ecosystems exposed to eutrophication	% reduction respect to 2005	2020	10%	25%	43%	70%	100%
Air pollution	Thematic Strategy on Air Pollution	Reduction of air emissions: SO2 by 82%, NOx by 60%, volatile organic compounds by 51%, ammonia by 27%, and primary PM2.5 (particles emitted directly into the air) by 59%	Level of achievement of target	2020	0%	50%	100%	150%	200%
Water	Water Framework Directive	Restore degraded inland surface and ground waters to "good status"	% of good status water	2015	80%	100%	100%	100%	100%
Water	Roadmap to a Resource Efficient Europe (EC, 2011)	By 2020, good environmental status of all EU marine waters is achieved	% of good status water	2020	70%	85%	100%	100%	100%
Biodiversity	EU Biodiversity to 2020	100% more habitat assessments and 50% more species assessments under the Habitats Directive show an improved conservation status; and 50% more species assessments under the Birds Directive show a secure or improved status.	Level of achievement of target	2020	0%	50%	100%	150%	200%
Biodiversity	EU Biodiversity to 2020	ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15 % of degraded ecosystems	Level of achievement of target	2020	0%	50%	100%	150%	200%
Biodiversity	EU Biodiversity to 2020	maximise areas under agriculture across grasslands, arable land and permanent crops that are covered by biodiversity-related measures under the CAP	Level of achievement of target	2020	0%	50%	100%	150%	200%
Biodiversity	EU Biodiversity to 2020	Forest Management Plans are in place for all forests that are publicly owned and for forest above a certain size	Level of achievement of target	2020	0%	50%	100%	150%	200%
Biodiversity	EU Biodiversity to 2020	Invasive Alien Species and their pathways are identified and prioritised, priority species are controlled or eradicated, and pathways are managed to prevent the introduction of new ones.	Level of achievement of target	2020	0%	50%	100%	150%	200%
Biodiversity	EU Biodiversity to 2020	the EU has stepped up its contribution to averting global biodiversity loss	Level of achievement of target	2020	0%	50%	100%	150%	200%
Recycling	The Roadmap to a Resource Efficient Europe - "The Roadmap"	50% of reuse/recycling of municipal waste	% of municipal waste	2020			50%	75%	100%
Recycling	The Roadmap to a Resource Efficient Europe - "The Roadmap"	70% of reuse/recycling/recovery of construction and demolition waste	% of construction waste	2020			70%	90%	100%

Maps

Illustration 10 Evolution of macro magnitudes 2010 – 2030: population and gross domestic product

Population change 2010 – 2030 (Baseline)



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

Regional level: NUTS2
Source: IOM, 2013
Origin of data: MULTIPOLES Model
© EuroGeographics Association for administrative boundaries

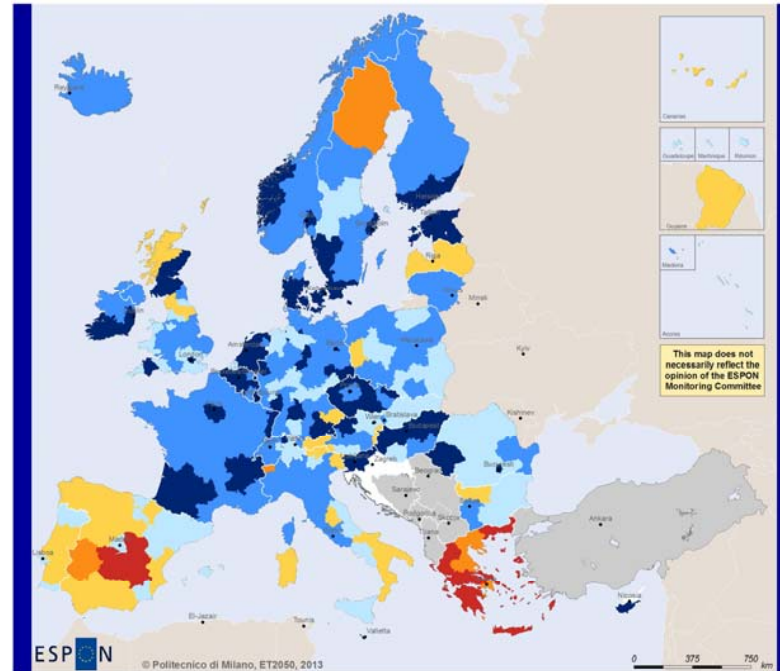
Annual population change (Units: %)

Results obtained by MULTIPOLES forecast model

- < -0,5%
- -0,5% - 0%
- 0% - 0,5%
- 0,5% - 1%
- > 1%
- No data (ESPON space)
- No data (No ESPON space)

European population growth will tend towards stabilisation. Total population (ESPON Space) will grow from 514 million in 2010 to 530 million in 2030. MULTIPOLES is a cohort-component population dynamics model. It is used for the simulations of complex hierarchical multiregional, multi-country population systems; for analysing impact of various scenarios concerning migration, fertility, and mortality.

GDP growth 2010 – 2030 (Baseline)



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

Regional level: NUTS2
Source: Politecnico di Milano, 2013
Origin of data: MASST3 Model
© EuroGeographics Association for administrative boundaries

GDP Growth annual average rate (Units: %)

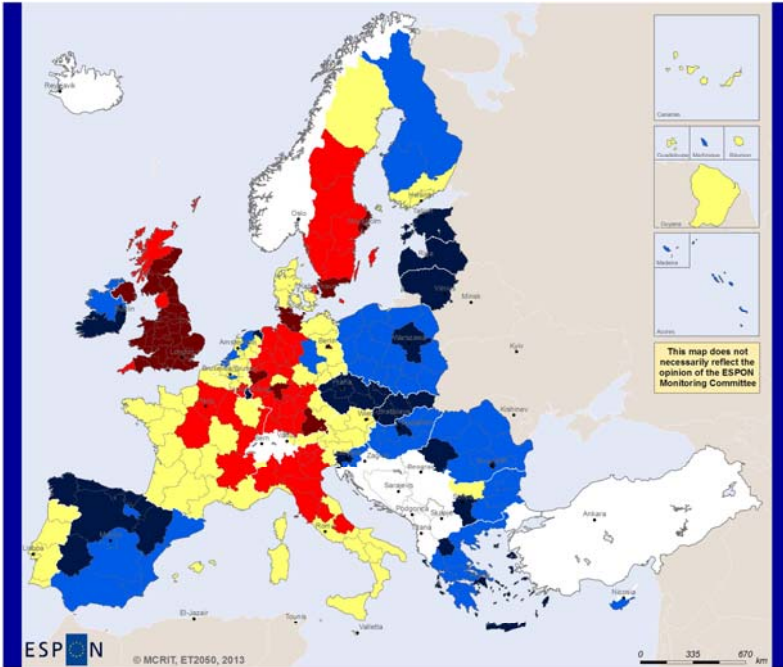
Results obtained by MASST3 forecast model

- < 0%
- 0% - 0,5%
- 0,5% - 1%
- 1% - 1,5%
- 1,5% - 2%
- > 2%
- No data (ESPON space)
- No data (No ESPON space)

Economic growth at very different speeds, leading to an increase in inter-regional economic disparities. Number of regions below to 1% of GDP growth: 45 (16%). ESPON Space annual average GDP growth rate: 1.89% MASST3 is an econometric, macroeconomic, sectoral, social and territorial model. It has been upgraded to explicitly take into account the impact of the current economic crisis.

Illustration 11 Impact on GDP per capita: from regional convergence to increasing disparities after the crisis

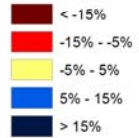
GDP per capita change 2000 - 2008



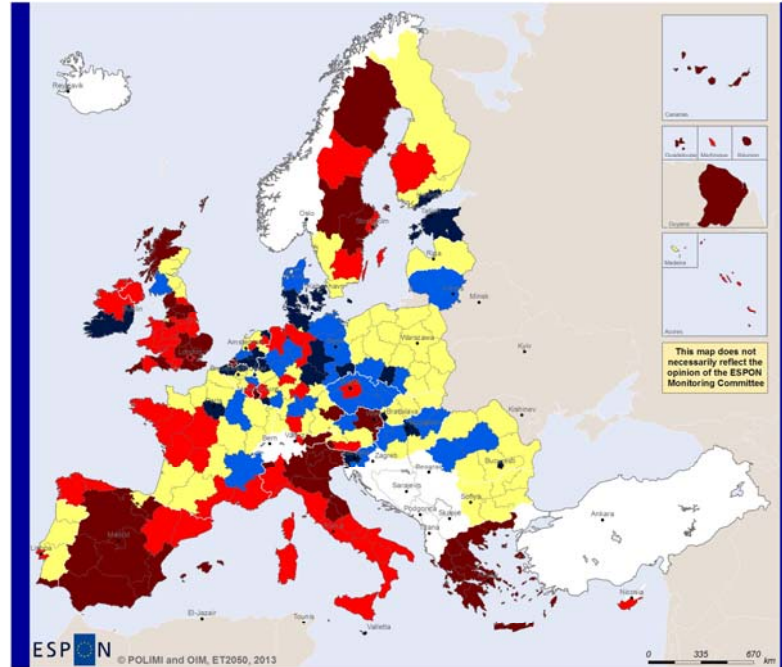
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Regional level: NUTS2
Source: MORT, 2011
Origin of data: ESPON DATABASE
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Relative change in GDP per capita growth in relation to EU27 average



GDP per capita change 2008 – 2030 (Baseline)



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Source: MORT, 2011
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Relative change in GDP per capita growth in relation to EU27 average

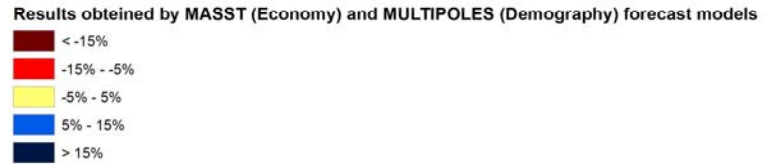
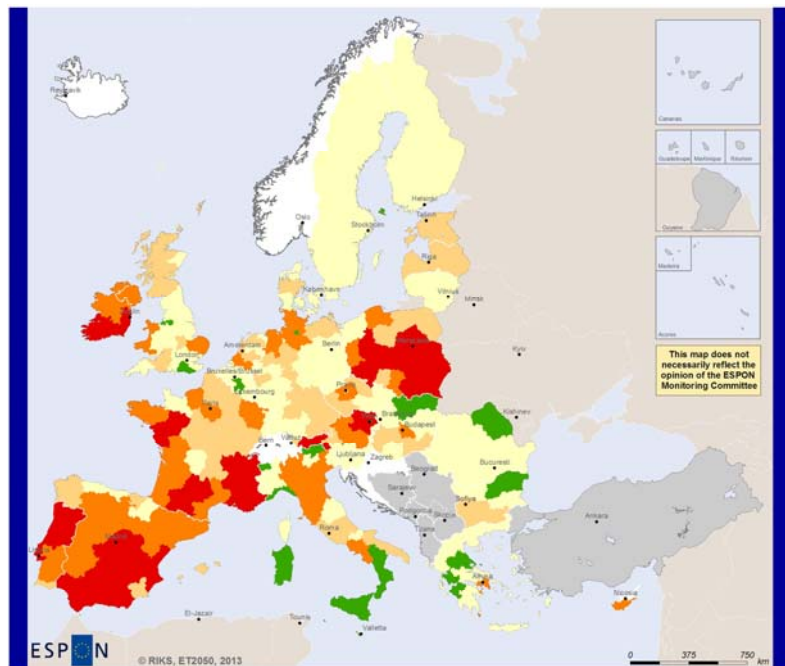


Illustration 12 Annual land take (Residential tourism not included).

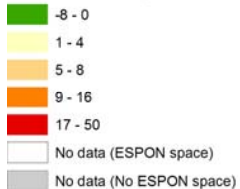
Annual land take 2000 - 2006



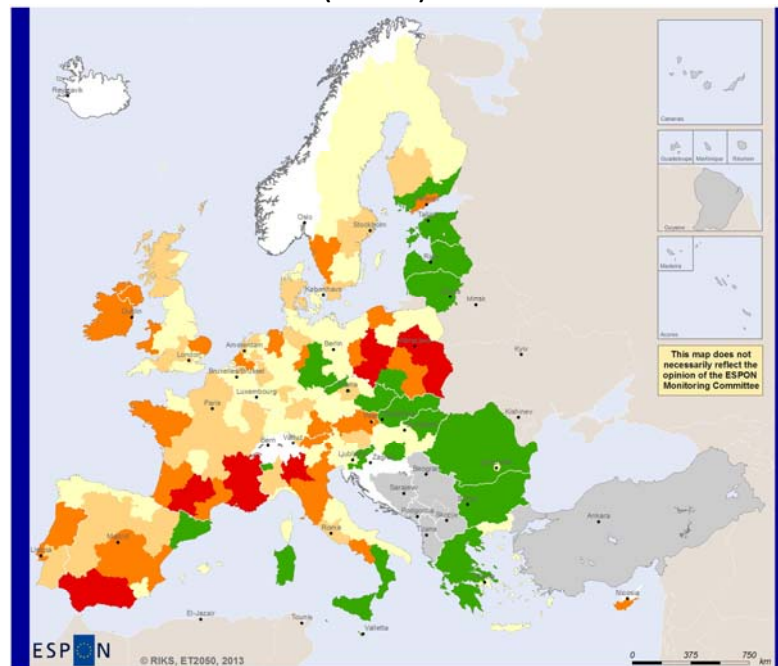
Regional level: NUTS3
 Source: Research Institute for Knowledge Systems (RIKS), 2014
 Origin of data: METRONAMICA Model
 © EuroGeographics Association for administrative boundaries

Annual land take 2000 - 2006 (Units: km²/ year)

Results obtained by METRONAMICA forecast model



Annual land take 2010 - 2030 (Baseline)



Regional level: NUTS3
 Source: Research Institute for Knowledge Systems (RIKS), 2014
 Origin of data: METRONAMICA Model
 © EuroGeographics Association for administrative boundaries

Annual land take 2010 - 2030 (Units: km²/ year)

Results obtained by METRONAMICA forecast model

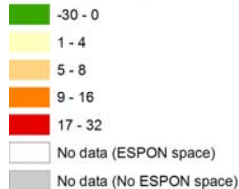
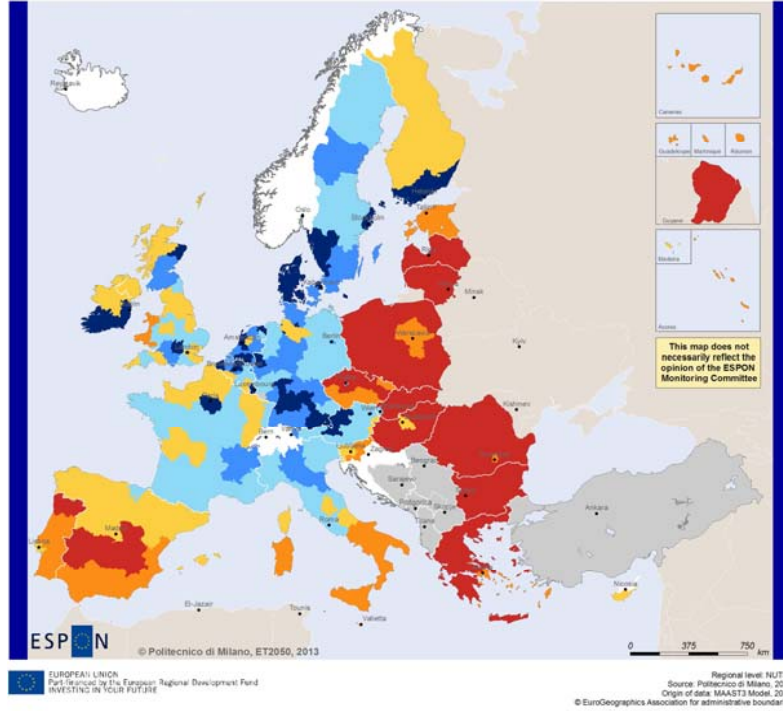


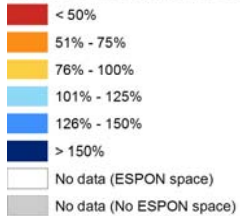
Illustration 13 Regional Economic GAP 2030 - 2050

Regional Economic Gap 2030 (B)

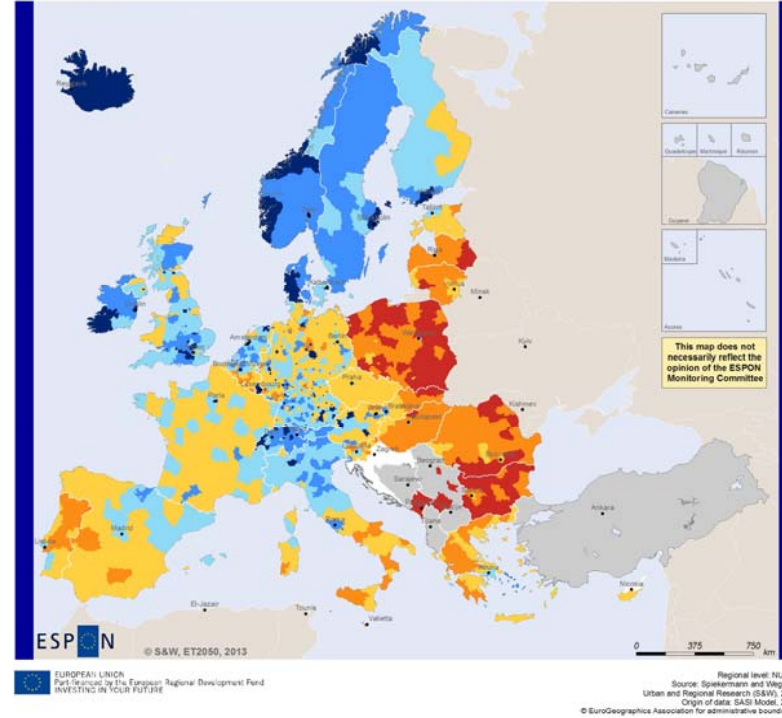


Dispersion from EU GDP per capita average 2030 (Units: %)

Results obtained by MASST3 forecast model



Regional Economic Gap 2050 (C2)



Dispersion from EU GDP per capita average 2050 (Units: %)

Results obtained by SASI forecast model

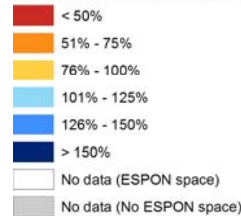
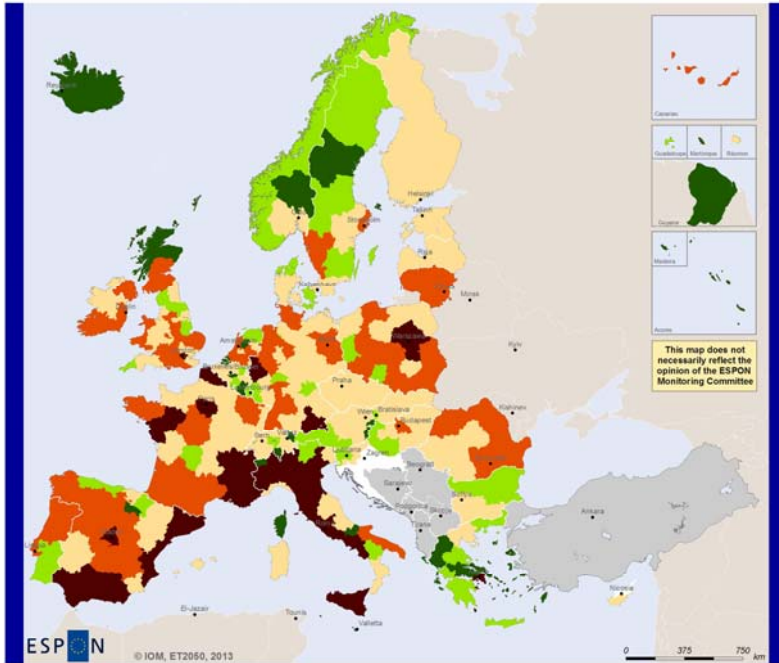


Illustration 14 Population change 2030 - 2050

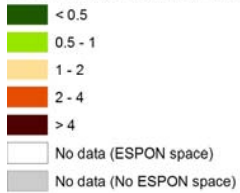
Total Population in 2030 (B)



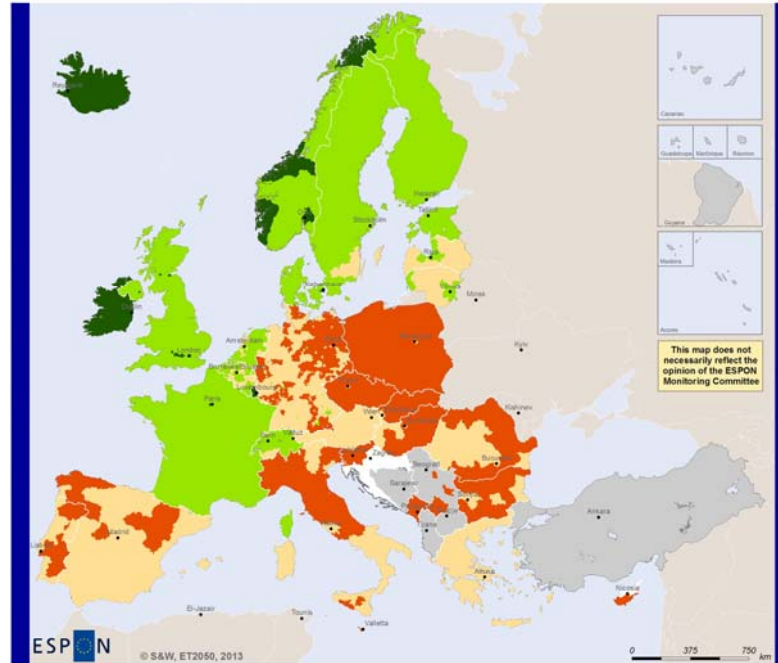
ESPON
 © IOM, ET2050, 2013
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 Regional level: NUTS2
 Source: IOM, 2013
 Origin of data: MULTIPOLES Model, 2013
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Population at regional level 2030 (Units: Million inhabitants)

Results obtained by MULTIPOLES forecast model



Population Change by 2050 (C2)



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 Source: Spiekermann and Wegener
 Urban and Regional Research (S&W), 2013
 Origin of data: SASI Model, 2013
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Total population change (Units: %)

Results obtained by SASI forecast model

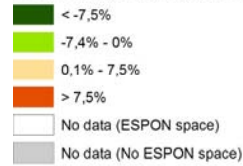
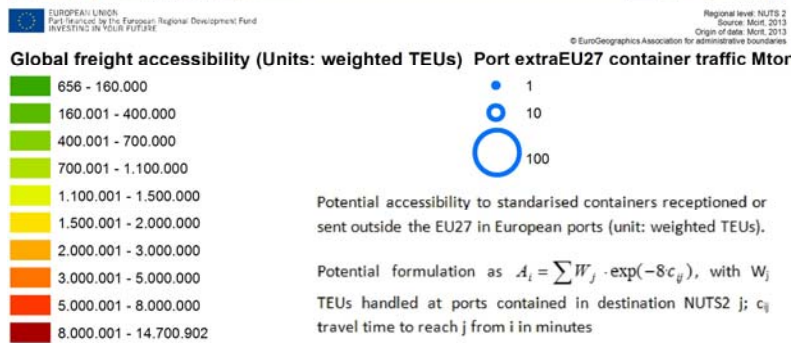
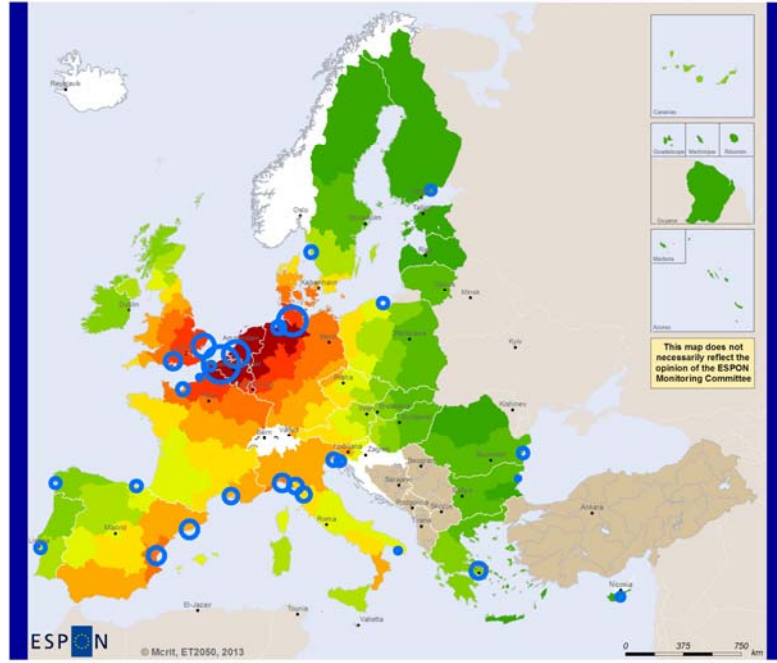


Illustration 15 Global accessibility 2030 - 2050

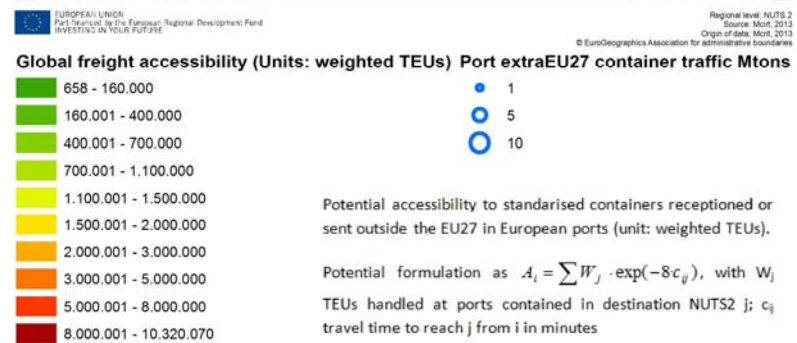
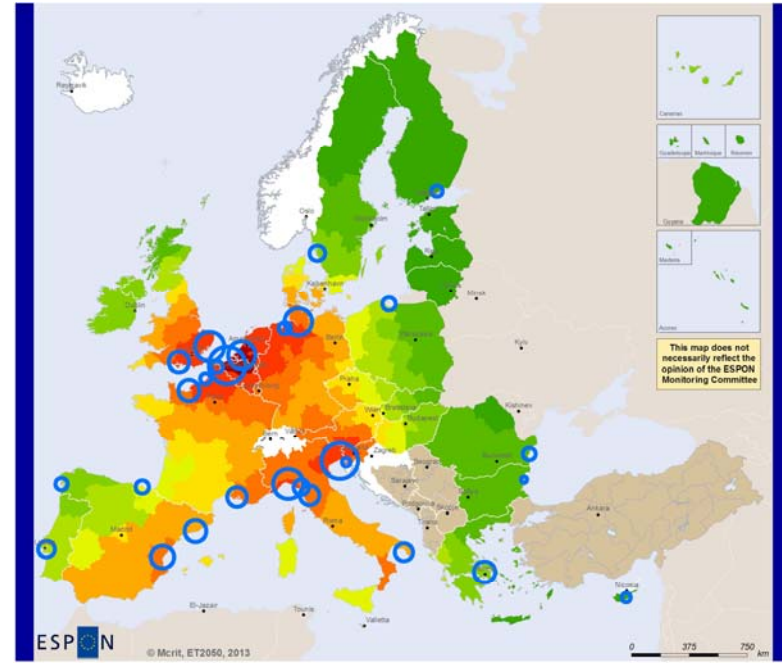
Global freight accessibility 2030 (B)

Potential accessibility to large commercial ports



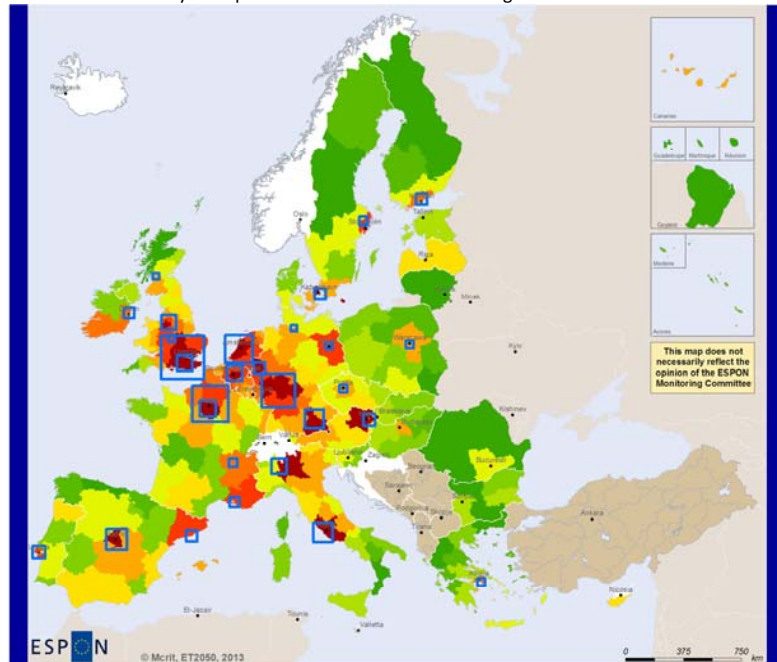
Global freight accessibility 2050 (C2)

Potential accessibility to large commercial ports. North/ South traffics to/ from Asia rebalanced



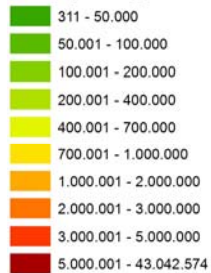
Global passenger accessibility 2030 (B)

Potential accessibility to airplane seats in intercontinental flights



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Global passenger accessibility (Units: weighted seats) Intercontinental passengers

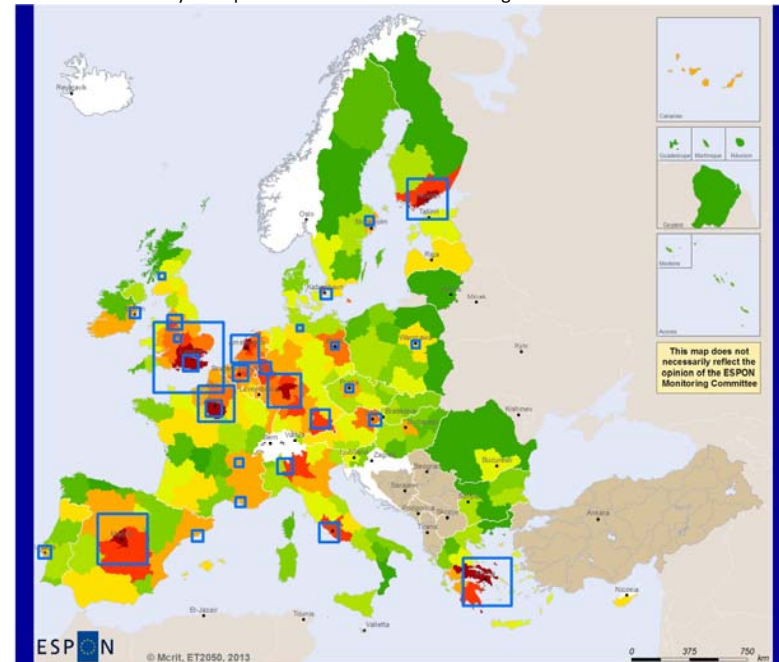


Potential accessibility to seats offered in intercontinental flights departing from and arriving to European airports (unit: weighted seats).

Potential formulation as $A_i = \sum_j W_j \cdot \exp(-0,02c_{ij})$, with W_j seats in intercontinental flights offered at destination NUTS2 j ; c_{ij} travel time to reach j from i in minutes; intercontinental flight seats available at destination are considered proportional to intercontinental passenger demand in airports contained in NUTS2.

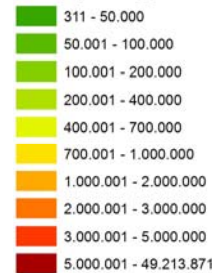
Global passenger accessibility 2050 (C2)

Potential accessibility to airplane seats in intercontinental flights



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Global passenger accessibility (Units: weighted seats) Intercontinental passengers



Potential accessibility to seats offered in intercontinental flights departing from and arriving to European airports (unit: weighted seats).

Potential formulation as $A_i = \sum_j W_j \cdot \exp(-0,02c_{ij})$, with W_j seats in intercontinental flights offered at destination NUTS2 j ; c_{ij} travel time to reach j from i in minutes; intercontinental flight seats available at destination are considered proportional to intercontinental passenger demand in airports contained in NUTS2.