

ET2050 Draft Final Report

MAIN REPORT

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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

Main Draft Final Report of ESPON ET2050

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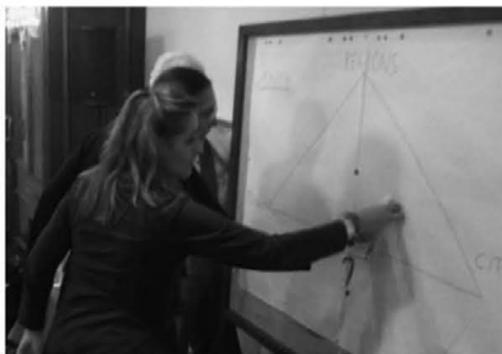
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Presentation

- The main aim of this document is to present the Vision for the European Territory developed in the ESPON Scenarios and Vision (www.et2050.eu¹) project. Its purpose is to fuel the debate about the long-term future of the European territorial development, and the policies more closely related to it, Cohesion Policies in particular. To this aim, an ideal Vision of what the European territory could be in 2050 is outlined.
- The Vision assumes that political objectives and targets already set at EU level for 2050 will mostly be attained, and proposes specific objectives and targets for territorial development, as well as possible directions for long-term policy reforms.
- The Vision follows up a long tradition on territorial and prospective policy documents at European level, from the ESDP, Europe 2020 Strategy, Green Paper on Territorial Cohesion, European Territorial Agenda 2020, Common Strategic Framework (CSF), ESIF 2014-2020 11 Thematic Objectives, Cohesion reports, Transport Roadmap 2050, Energy Roadmap 2050, Resource Efficiency Roadmap 2050. The Territorial Vision 2050 presented is in line with these visions and their policy targets. Previous prospective studies and foresight researches such as ESPON 3.2, Global Europe TRANSVISIONS, PASHMINA, FLAGSHIP, SCENAR, LUMOCAP among others, were also taken as starting points. The Vision also takes into account Visions and strategies defined at regional, national and trans-national scale in Europe.
- A participatory process with ESPON Monitoring Committee members was carried out in a number of scientific and policy-oriented workshops in Krakow (2011), Aalborg (2012), Paphos (2012), Dublin (2013) and Vilnius (2013) (please see full information at www.et2050.eu).
- 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, and workshops and discussions were organized during 2013 and 2014 together with these institutions.
- A representative number of stakeholders were also consulted in a workshop celebrated by ESPON in Brussels (2013), interviews and surveys.
- The methodology to build up the Vision also included the use of advanced forecast models covering demographic, economic, transport, land-use and spatial development fields, as well as methods to assess the territorial impact of socioeconomic trends and policies.
- The *Three Horizon Technique* was applied for the foresight exercise, involving participatory and expert analysis, qualitative and quantitative approaches, along three perspectives: 1) continuation of the current trends and policies which are manifest now, (first horizon); 2) realization of changes, opportunities and midterm policy pathways required to create the conditions for the long term aspirations and vision, until 2030 (second horizon); 3) building a new future that breaks the inertia of current trends, enabling pervasive change towards a normative vision of the world, in the period 2030-2050 (third horizon)².

¹ The ESPON ET2050 project started in 2011. In it participate consultancy, research institutes and academic institutions from 9 different countries, 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 (Barcelona). Full information is available at www.espon.eu, and ongoing works at www.et2050.eu.

² The *Three Horizons* technique is an established technique to organizing how we approach and deal with uncertainty.



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 REG1, 25 June 2013



DGREGIO EC, 25 June 2013



Vision Workshop, October 2013



COTER, 9 October 2013



Committee of the Regions, 19 February 2013

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.

The Need for a Territorial Vision for Europe

- **2050 is almost here.** We live in a world of emerging economies, fast population growth and massive migrations towards large megalopolises, extensive urban regions with more than twenty or thirty million people, and exponential increases of flows of information, goods, energy, and other resources. Millions of people are moving from poverty to middle classes worldwide, while social disparities grow also in the most developed world, including European countries. We face new global environmental uncertainties, and scarcity is expected for many non-renewal resources. 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, both in urban and more rural zones, empowering people, promoting more inclusive societies and participatory government, induce cosmopolitanism and environmentally conscious behaviour, or have just the opposite impact, further centralising world power in few large public or private, corporations, modifying human condition in unexpected ways. Political choices to be made nowadays have a paramount importance to prepare Europe for a sufficiently satisfying future for all.
- **Territory matters.** Europe is not a flat and empty space free from development constraints, but an old civilised territory made of hundreds of thousands of cities, a predominantly man-made landscape, an extremely diversified mosaic of regions with different assets, memories and histories. The growth in Europe is not concentrated in few global megalopolis but distributed across complex networks of cities articulated at different geographic scales, from small towns in remote rural regions to global metropolis .
- **Europe needs a Territorial Vision for 2050.** Europe is a mature and complex, old urbanised territory, linked by a dense transport infrastructure network, still divided by political borders. European's mental geographies remain heavily constrained by national territories, and the history and the geography of Europe is still is made of contradictory national narratives, filled with prejudices and stereotypes. Even though people have become more mobile and relations between large cities across Europe have increased in the latest twenty years, as much as relations with the rest of the world, cross-border relations are limited to those regions where always have existed. On the other hand, The territorial dimension of European policies needs to be made more explicit, because the territory can not be in Europe a passive recipient of activities. The paramount challenge of policies is to reconcile openness to economic and technological global progress with place-based endogenous and sustainable development. Geographic distance plays a different role that it played in the past; paradoxically, when the economic value of place as location diminishes, it regains its cultural and ecological values. A European Territorial Vision should bring coherence and consistency to the patchwork of territorial visions developed at other scales by articulating the fragmentation inherent to the administrative structure of Europe. Taking lessons from the past experience, a "new generation" of European Cohesion policies needs to be defined to face future challenges and opportunities.

Lasting Values and Policy Paradigms for Europe

- **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. Participatory government.

- **Sustainable development, well-being and quality of life:** universally accessible human and harmonious development, encompassing three dimensions: economic, environmental and social³.
- **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 poverty and unemployment, including commitments of responsibility by those receiving financial aid⁴.
- **Territorial efficiency and cohesion:** The overall task assigned to Cohesion policy (and the Structural Funds and the Cohesion Fund) is to promote overall harmonious development reducing disparities between regions. 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). This is achieved through considering both the efficiency and equity dimensions of development, and establishing two interdependent although different policy objectives: (i) all regions must be given the opportunity to achieve their full potential, using their specific territorial capital (territorial efficiency), and (ii) all citizens must enjoy an equivalent quality of life.
- **Advancement of the “European project”.** Europe is a unique political project at world level. The achievement of social and territorial cohesion among Europeans lies at the core of this political project. The EU will solve actual “democratic deficits” and function as a federation in practical terms, thanks to (i) policy integration achieved in most common priority matters, (ii) new fiscal and cohesion principles, (iii) practice of multilevel governance based on the subsidiarity principle. The EU will continue the enlargement process, geographical widening the EU boundaries, having close relations with Neighboring countries and the rest of the world.

Visions for the European Territory

- The first analysis of European Spatial Development patterns and prospects at regional level were developed in the **Europe 2000** (1991) and **Europe 2000+** (1994) programs in the late eighties by the DGXVI, now DGREGIO, of the European Commission. 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 (the latest, the 8th Cohesion report expected in April 2014)⁵.

³ In this respect, the GDP measure of growth is to a large extent obsolete. 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).

⁴ 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.

⁵ The Vision for the European Territory in 2050 proposed in this document, follows up and updates previous territorial political analysis carried out in Europe, strategies and visions defined for 2000, 2020 and 2030. It also considers strategies and visions developed for particular macro-regions, such as the Baltic region, the Danube region, and the Mediterranean, and at National and even regional level.

- 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 competitiveness of the European territory. The key policy aims presented were based on achieving a polycentric and balanced spatial development of the European Union⁶.
- 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 establish an internal market. It shall work for the sustainable development of Europe based on balanced economic growth and price stability, a highly competitive social market economy, aiming at full employment and social progress, and a high level of protection and improvement of the quality of the environment. It shall promote scientific and technological advance. It shall combat social exclusion and discrimination, and shall promote social justice and protection, equality between women and men, solidarity between generations and protection of the rights of the child. It shall promote economic, social and territorial cohesion, and solidarity among Member States. It shall respect its rich cultural and linguistic diversity, and 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

⁶ 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

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 knowledge⁷.

- 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 poverty⁸.
- 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”⁹. The TA

⁷ 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.

⁸ 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.

⁹ 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.

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.”

- 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)
- Following up this process there is a need to further develop the European Cohesion policy establishing explicit territorial targets for Cohesion and Structural funds, as well as enhancing the territorial dimension of other policies. There is a need for a radical governance change favouring regional and local level to fully implement the place based approach, as well as to reinforce the EU level for coordination and strategic planning, with a clear focus on the territorial dimension.
- 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.
- In the first years of the 21th Century, before the crisis, most European analysts were concerned with the so-called “Steady Decline” of European economy¹⁰, in comparison with the rest of the world. European countries were considered slowly declining economies, with limited technologic innovation, not efficient-enough public institutions, with less political power at world level than ever. This underperformance was considered striking because it contrasted not only with expectations but also with the past performance of European countries and the rest of the Western world accomplishment. 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. After the Maastricht Treaty in 1992, the creation of the European Union and the euro, the Single Market and political integration of European countries were considered by most analysts a successful process.
- After the economic crisis, European views suddenly changed by concerns not much on the average growth of European countries but on the public and private debts, particularly in Southern countries, the north-south and west-east economic unbalances and the growing social and

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- Managing and connecting ecological, landscape and cultural values of regions, including joint risk management as an essential condition for long-term sustainable development.

¹⁰ 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.

territorial disparities. The insufficient coordination and financial solidarity at European level resulted in risks of fragmentation. The impacts of the economic crisis may last for the next decade if not technologic shifts, new social behaviour and deep political reforms occur in the coming years.

- 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.

National Territorial Visions in Europe



Illustration 1 National Territorial Visions in Europe

Europe now, in the crisis aftermath¹¹.

1. **End of the catching-up period.** After one-, one-and-half decades of gradual 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 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. On many Southern European regions growth and welfare increases were not just related to productivity improvements but also because of the inflow of resources, from migrants to foreign investments in many sectors, including speculative markets, and excess of consumption resulting in high private debt levels.

2. **Risk of Increasing National Disparities.** The convergence process of the previous decade has suddenly been reversed. Southern countries, larger recipients of Cohesion and Structural Funds in the previous decade, have reduced their GDP during the crisis, around 10% in Spain and Italy, more than 20% in Greece, with above 25% official unemployment levels; at the same time, Central and Northern countries were stagnant or had small growth, less than 5% in Germany. Eastern European Countries had different evolutions, some growing at moderate level, like Poland, as well as Baltic countries, after carrying on drastic fiscal reforms. While more developed countries are expected to grow because of productivity increases, less developed countries may grow in the short-term 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. Increasing disparities in economic growth results in increasing disparities in social welfare because of the need to reduce public debt and apply cuts to public expenditures.

3. **Risk of Increasing Regional Disparities.** At regional level, we may see disparities growing; in new member states capital regions are the winners, while rural and eastern border regions may likely be the losers¹². 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.

4. **Economic activities move from place to place more easily than ever.** Worldwide networks transmitting information and energy, transporting freight and people become interconnected at all scales, from the body of the world¹³. The centralisation of advanced activities is simultaneous to the decentralisation of low-added value activities. The just-in-time integration of worldwide information and

¹¹ This chapter presents "First Horizon"

¹² 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.

¹³ 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).

financial flows increases vulnerability and risk and needs to be balanced by local and regional self-sufficiency in strategic resources and activities. In Europe, any policy is local, in the sense that it has local and regional impacts, which people are sensitive to. Therefore, there is always a need to make the territorial dimension of policies explicit.

5. **The European Project.** Since it was first imagined after the Second World War, the “European project” has until now progressed mostly because of the economy and the construction of a Single Market, and successfully overcoming a number of political crisis. Because of the economic emergence of Asia, and the rest of the world, and the already achievements of the Single Market, the future the progress of the “European project” will likely depend less on the economic driver, and more on citizens willingness to achieve a political vision for the future of all.

6. **The need for a sustainable management of scarce natural resources,** while taking into account location specific challenges and opportunities remains as a paramount challenge for Europe and the planet as a whole, as well as the need for mitigation and adaptation measures for natural hazards. Health issues will be increasingly important policy areas, especially those related to pollution, such as air, soil and water quality.

Europe towards 2030¹⁴

7. **Average moderate economic growth¹⁵.** The annual growth for Europe may be about around 1,89%¹⁶ in average between 2010-2030 if actual policies and technologies remain without significant changes. 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 region won't probably catch-up with the rest of Europe before 2030. In a business-as-usual 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 least during the next decade, because of current market forces.

8. **More Jobs and Lower Salaries.** The unemployment level in many European regions will keep driving salaries down in real terms for the years to come, 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

¹⁴ This chapter presents the “Second Horizon” of the foresight .

¹⁵ 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.

¹⁶ 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.

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.

9. ***Jobs will 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 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.

10. ***Policy matters: alternative regional development policies would have different impacts.*** Alternative assumptions have been tested¹⁷, including three scenario variants to the baseline: “market based favoring large metropolis” (A), “public policy based favoring second tier city networks at national level” (B) and “public policy with more social and regional redistribution at European level” (C)¹⁸. The “public policy based” is the most expansionary in terms of GDP (+2,31% yearly), followed by the “market driven” (+2,22% yearly). C achieves 1,82%. 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 also 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 based on efficient first rank cities. With respect to the baseline, New12 countries gain the same from A and B, while the western countries have a clear higher advantage from the B than from A when compared to the Baseline.

11. ***Place matters.*** The A 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.

¹⁷ 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.

A variant with 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.

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

¹⁸ These three scenario variants for 2030 are in line with the A, B and C Scenarios defined for 2050.

12. **Population Ageing**¹⁹. 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 fertility²⁰. 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.

13. **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).

14. **More Labour migration within Europe**²¹, 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

¹⁹ 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.

²⁰ 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.

²¹ 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

but favouring particular skill groups which are in high demand. This mechanism will have a powerful detrimental effect on sending regions, increasing regional disparities.

15. **External migrations**, driven by many different factors, it will continue to increase. Migration from third countries, especially from the EU neighbouring countries, if not restricted, will grow, especially to regions with relatively large agriculture, construction or tourism sectors, as well as to large cities. It is assumed that until 2030 extra-European immigration will increase by 2 per cent every 5 years, afterwards it will be constant. In the most crisis-hit countries the increase will be delayed by five years. Since no major changes in demographic policies across Europe are expected, the number of immigrants will be growing slowly to respond to the labour shortage related to the ageing of Europe.

16. **Internal non-labour migration**. Even if data concerning non-labour migration, such as residential tourism is scarce at European level, it is known that in Southern regions migration due to residential tourism attracting retired persons is high and will likely grow (some 800.000 people in the Spanish Mediterranean coastal regions, with a significant variation over the year), being a positive social and economic development driver of health and other advanced personal services. Migration policy will need to become smarter to deal with the increasing diversity of migrants, and migration purposes, often non permanent.

17. **New forms of sustainable tourism** in areas such as education and training, health and leisure, cultural and business will emerge as personal added-value services. Tourism will grow as much as middle classes also grow 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 diminishing the economic added value of tourism. Ageing will induce new types of tourism in Europe. 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. While massive tourism is a serious threat for a sound management of natural and cultural landscape, new forms of tourism become an opportunity.

18. **Transport demand will be more diversified and will increase below economic growth**²². Decoupling transport demand from economic growth will likely happen for urban and short-distance mobility in more developed cities and regions, but it is not likely for freight and passengers for long-distance, particularly for intercontinental transport. More diversified trip purposes and specialised transport modes are expected, while transport costs for passengers and freight are not likely to rise even if full social and environmental externalities will be included in the price of transport, because of technological progress²³; new vehicles and more intelligent transport management will reduce the costs of travel, and market inefficiencies inside Europe will gradually likely diminish because of the completion of the Single Market on transport and other network industries, specially if there is an opening of global

²² 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

²³ 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.

markets to more competition. Transport, even as a network industry, is heavily influenced by national interests, and changes are likely result mostly from new companies entering in the European transport market. While in most Eastern European regions there are still important deficits in infrastructure constraining economic growth, in many Southern regions infrastructure endowment is high, largely because of Cohesion and Structural Funds, to the point that infrastructure is one of the main assets for future development. 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 the possibilities for Private-Public Partnerships. A significant increase on infrastructure maintenance and communication technologies will be required. The selection of public investment will have to assure in the future a minimum economic profitability, the right participation of private companies, local and regional governments, as well as necessary accompanying territorial policies, especially when the profitability is low.

19. **Energy intensity will gradually decrease** both due to more service oriented European economies and increased energy efficiency. Carbon intensity (GHG emissions elasticity in relation to energy consumption) is expected to decrease due to improved technology, especially in renewable sources like wind and solar. Renewable sources are expected to grow²⁴ and nuclear facilities maintained, or gradually dismantled, 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, making European production less competitive. New energy technologies (e.g. nuclear fusion) seem unlikely in the next decades but they will provoke a revolutionary change, if they happen.

20. **Urbanization**²⁵. The urban surface may still grow rapidly (898 km² per year of new artificial land between 2010 and 2030, on average²⁶), often in the form of uncontrolled urban sprawl. Main drivers are people migration from rural areas to cities and people using more (residential) space per capita (larger houses, less people per family). Although industrial and commercial land uses tend to become denser (higher GDP per surface area), the overall process is still one of increasing urban surface. The problem is not just the increase in sealed soil, but even more the uncontrolled element of it: where does development take place (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. Compact development with well-planned surroundings and good accessibility, may enhance quality of life and minimize negative impacts of transport and soil sealing or uncontrolled development along the roads, within pristine natural areas (causing habitat fragmentation) or on highly productive agricultural soils.

21. **Fuzzy geographies: beyond urban and rural narratives.** Europe is largely made of "middle landscapes", or "hybrid geographies". "Urban" areas can be found in rather rural landscapes, while "rural" areas can be found within urban landscapes. Urban and rural are better understood as the extremes of a highly diversified continuum. This is not to say that the traditional distinction between urban and rural is completely vanished: still predominantly rural regions can be clearly recognised as well as the large metropolitan centres. Europe is made up of a very diverse and mixed mosaic, with a wide variety of

²⁴ 20% of gross final energy consumption from renewable energy sources by 2020, 50% by 2050 (EC Energy Reference Scenario, DG Energy 2014)

²⁵ 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.

²⁶ 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.

landscapes in a rather small territory. This creates the uniqueness of the European territory and is the result of natural and man-made developments.

22. ***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 vegetation²⁷. 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 agriculture area offer possibilities to connect high value natural areas into a green infrastructure throughout Europe?

23. ***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 obviously 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.

24. ***The advancement of the "European project" depends on citizens willingness.*** In the 2008 crisis aftermath, we now enter in a new period where European political integration will not likely happen just because of economic common interests. In the 2008 crisis aftermath, the economy may not be the powerful driver for political integration that it was in the recent past. The advancement of the "European project", and the reinforcement of common values and policies, particularly Cohesion among territories, will likely require deep policy reforms, only feasible by a political willingness based on citizens' acceptance and more active involvement. The "European model" is based on healthy and inclusive societies governed by accountable public institutions, focused on the well-being of Europeans. Until now, the 'European added-value' of actions and initiatives had to be demonstrated, and justified according to the subsidiarity principle, 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. It is however be the "national added-value" the one that will have to be demonstrated in relation to the local and the European levels. The process of political integration of European countries was simultaneous to their economic and social renaissance, realised according to the so-called "European model". Community of values, human rights, democracy.

25. ***Territorial Impacts***²⁸. The assessment of the territorial impacts of expected future developments reveals that for all regions in Europe, positive impacts will most likely overcome negative ones. A clear convergence in territorial wellbeing and quality (territorial cohesion) is expected by 2030 in terms of overall

²⁷ 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.

²⁸ The summative analysis of scenarios is considered via the addition of impacts on 4 different fields (economy, society, environment, territorial identity). Economic fields encompass, inter alia, GDP, innovation and accessibility. Weights for impact field were agreed on work sessions with the ESPON MC in December 2012.

social, environmental and identitarian conditions, as well as in economic terms. Best performance is expected in NMCs, eastern regions of Germany, Portugal, Spain (particularly central and southern), France (particularly western), southern Belgium and also, to a lesser extent, Finland, Denmark, central and southern Italy and Greece. Lower improvements will be experienced in the Netherlands, western Germany, Austria and northern Italy, where the starting level was already higher than the European average. The impact on economic fields will be overall positive, and particularly strong in NMCs, Baltic western countries, western and southern France. Strong national effects will keep southern European countries, and Greece in particular, much less affected by positive changes. Negative societal scores are expected to concentrate in a large central European north-south belt running from Holland and Germany to Italy, touching also Belgium and Austria, showing the inability to maintain the present good situation. Negative environmental impacts will be in general not very intense, mostly concentrated around largest European cities (Dutch cities, Paris, London, Munich, Rhone-Alpes, Copenhagen) and coastal areas (Mediterranean, North Sea, Baltic). Territorial identities will perform positively across Europe, with the highest values shown by most Mediterranean countries, a relevant number of Eastern countries and areas of Scandinavia.

Central, Eastern and Southern Europe

26. ***An average moderate economic growth is expected in the region.*** If a low growth of 2,2% is the case for CEECs towards 2030, the existing gap would hardly change and Central and Eastern Europe remains on the European periphery. CEECs followed the pattern of a dependent market economy (DME) 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.

27. ***More rapidly increasing national disparities*** 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.

28. ***The crisis has further increased the regional disparities.*** 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.

The 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 in our dataset by 2010.

Scenario A in CEE 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 lack and weakness of secondary cities (regional poles) 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 (ITIs). 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 peripheries.

Employment-wise, cohesion policies positively affect both rural and peripheral areas, 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.

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.

29. **Unstable heterogeneous demographic trends.** Demographic trends and 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. Challenges that need to be met are therefore the spatial concentration of positive or negative demographic development.

30. **Insufficient productivity.** 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.

31. **Urbanisation stress** has been particularly important along the coastal strip while 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.

32. **Geostrategic opportunities** The Mediterranean area offers a route for exchanges of manufactured products between Europe and Asia, as well as for the supply of Europe with energy products from the Gulf countries. The most pressing challenge is related to possible climate change impacts on the regional energy infrastructure.

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.

In **Scenario A**, Southern European population is lower 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. In **Scenario B** population is slightly higher 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. This scenario also maintains approximately the same speeds as Baseline 2010. **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. This scenario also maintains approximately the same speeds as Baseline 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). Also, global accessibility tends to remain concentrated in the core of Europe, indicating that key global hubs (ports and airports) will mostly remain inside the Pentagon, in the future.

Europe in the World, and the World in Europe

33. **European countries will trade more with the rest of the world.** 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 Europe²⁹. 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 28% of the world GDP, and it is expected to represent 17% in 2050.

²⁹ 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.

34. **More Diversified Globalisation.** Companies located in different European countries and operating in different economic sectors will take advantage of the growth of emerging markets differently, based on, among other factors, historical social and cultural links and also geographic proximity (e.g. UK with US and Commonwealth countries, Poland and Eastern regions with Russia and former USSR republics, Portugal with Brazil and few 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 diverge³⁰.

35. **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 (CEE) 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 CEE, still an attractive 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.

36. **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.

37. **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.

38. **Geographic Specialisation of Global Gateways.** The relative geographic redistribution and further specialisation of global gateways, either intercontinental ports and major commercial ports, together with

³⁰ 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.

their hub and spoke networks, would bring a net benefit to the European economy by reducing travel time and costs also promoting more balanced development opportunities. Is not by regional subsidies, but by further liberalisation, enhancing and completing the Single Market and opening up the European air and maritime markets to the rest of the world, that this geographic specialisation may occur.

The Other *Europes*: Mediterranean and Eastern Neighbourhoods

39. **Co-development Strategies.** Neighbouring countries have ideal conditions to become emerging economies, just two or three hours flying from major European cities, one day away by rail or maritime freight services. They have both opportunities to compete and cooperate with European bordering regions, and cooperation is needed to reduce potential conflicts and increase synergies. The positive impact of the process of “europeisation” in Greece, Spain and Portugal during the 70s, is already visible in the Balkans, and Turkey, and should be extensive to Ukraine, Belarus, Armenia, Moldova and other former USSR republics, and Southern Mediterranean countries. Environmental management requires for territorial co-operation with neighbouring countries, mostly in relation with the seas and coasts in the Baltic and Mediterranean, or the Black Sea.

40. **Integrated Cross-border Zones** will emerge, such as the Baltic and the Hanseatic league, the Danubian region, the Black Sea, the Adriatic-Ionian region, the Alpine region, the West Mediterranean³¹. These zones are strategic areas for territorial cooperation and planning, moving from historical conflicts to jointly developing their common assets, in areas such as Strait of Gibraltar in the Western Mediterranean, with Tanger-Med as emerging development area, and Turkey and Istanbul in the East Mediterranean, together with Cyprus, in the Middle East. Polish, Ukraine and Belarus. Romania with Moldavia, and Ossetia.

41. **Energy and Transport Interconnections.** Pipelines from Russia and Algeria are already connected to networks at continental scale. In a long-term strategy, a common Energy policy aiming to reduce European energy dependency will have to put in place an intelligent grid covering Europe north-south, integrating renewable sources such as wind in the north and solar in the south. Trans European Transport Networks need to be extended to the neighbouring countries, and South-Mediterranean ports be promoted to establish ferry and short-sea shipping links. Logistic gateways, like Tanger-Med may become a global hub, because of their strategic position in maritime routes from Asia to Europe and North and South America.

42. **Neighbouring countries are also European.** Eastern countries are European, and one way or another, Southern countries are part of the European history since the Roman times, finally becoming colonies of Spain, France and UK until mid twentieth century, when became independent after wars. Because of security, migration, energy and resource provision, logistics and environmental management, as well as because geographic proximity, European Union and Neighbouring countries will necessarily be increasingly interdependent.

Vision for Europe towards 2050³²

43. **Smarter Territories.** 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

³¹ 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.

³² This chapter and the next one introduce the “Third Horizon”

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, 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 likely be widely used to improve the efficiency of infrastructures in the context of smart cities and wider geographical scopes.

44. **Smart Mobility.** The reduction of traffic environmental impacts in European cities will make them more attractive for people to work and live. Changes in the quality of electric vehicles and urban transport management have the potential to radically change the landscape of European cities, most of them already engaged in ambitious traffic calm and public transport strategies. Concerning urban public transport, mostly automated metro and tram lines will continue to serve high demand routes.

45. **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, concerning history and geography, in particular the nationalistic myths created in the nineteenth century. The virtualization of life and work and the increasing importance of teleworking, e-shopping, electronic communication and social media has definitively established new lifestyles, habits and mobility behaviours. Lifestyles are more versatile, leisure activities are more widespread, and the everyday life is more irregular and quickly changing. A better fit between working time and leisure has increased residential mobility (more frequent changes of permanent residence as well as better use of secondary residences).

46. **Responsible Values.** New generations will likely live longer and healthier lives, thanks to molecular medicine and good health care. Europe’s ageing population will reflect the improvement of living conditions. This will have profound social and political implications, since values 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), but also pressure on public finances because of the higher numbers of people living on pensions and incurring long-term health care expenses.

47. **Better educated workforce, more free-lance jobs:** Possessing adequate cognitive skills has proved increasingly necessary for the capacity to enjoy life, for self-esteem, for increasing income and for finding jobs or founding new companies. A relative higher level of cognitive skills is 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.

48. **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.

49. ***Decentralised and 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.

50. ***Lesser energy dependence.*** EU 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 is 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.

51. ***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.

52. ***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: i) 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); ii) environmental constraints, which regulate growth while improving its quality and sustainability; iii) a larger share of low-productivity services (including personal services to ageing population). However, Europe has restored 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.

53. ***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 the "New Rural Economy (NRE)", i.e. other industries associated with the rural economy (e.g. tourism, local trade and products) and manufacturing and service industries more directly associated to bio-resources and organic agriculture.

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

55. **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 was almost negligible after 2030. Cities value becoming green cities and learning networks of green cities are created, stimulated by European initiatives such as the European Green Capital Award. 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. .

56. **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. In 2050, the marine potentials from the European seas will have been exploited, and the related challenges tackled. Together with other instruments of the EU policy – Integrated Coastal Zone Management, the Integrated Maritime Policy (mostly focused on maritime transport), and Maritime Spatial Planning, the strategy contributed to dramatically improve maritime governance. In 2050, also the international governance environment will be greatly improved. Common actions carried out by the UN (via the WEO) and the EU have been reinforced. Long negotiations have consolidated the law of the Sea, and the WEO has established a legally binding legal framework which is included in all sea governance arrangements.

57. **Increasing self-sufficiency** in areas such as food production, energy or water management. Production and resource management will tend to become more local. Europe has 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) has decreased 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 have been achieved during the first half of the century.

Territorial Strategies for Europe in 2050

58. **Three extreme and ideal territorial strategies are considered:** *The promotion and networking of large more developed metropolises (A), The promotion and networking of cities (B), and The promotion and networking of medium and small cities and more peripheral regions (C).* The objective is to explore to what extent average economic growth and regional disparities are affected by territorial strategies and regional policies in the long-run, and which one of these three ideal strategies should be further promoted by

European policies in the future. These alternative territorial ideal strategies are evaluated against different extreme framework socioeconomic and environmental conditions³³.

59. **Europe of Metropolises (A)**, would support capital and global metropolis and existing global gateways. This scenario provides an image of Europe in which the territory is more dynamic, flexible and adaptable to technological, social and economic change. This scenario follows to a large extent the *Europe 2020* strategy of promoting global competitiveness of Europe by promoting 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.

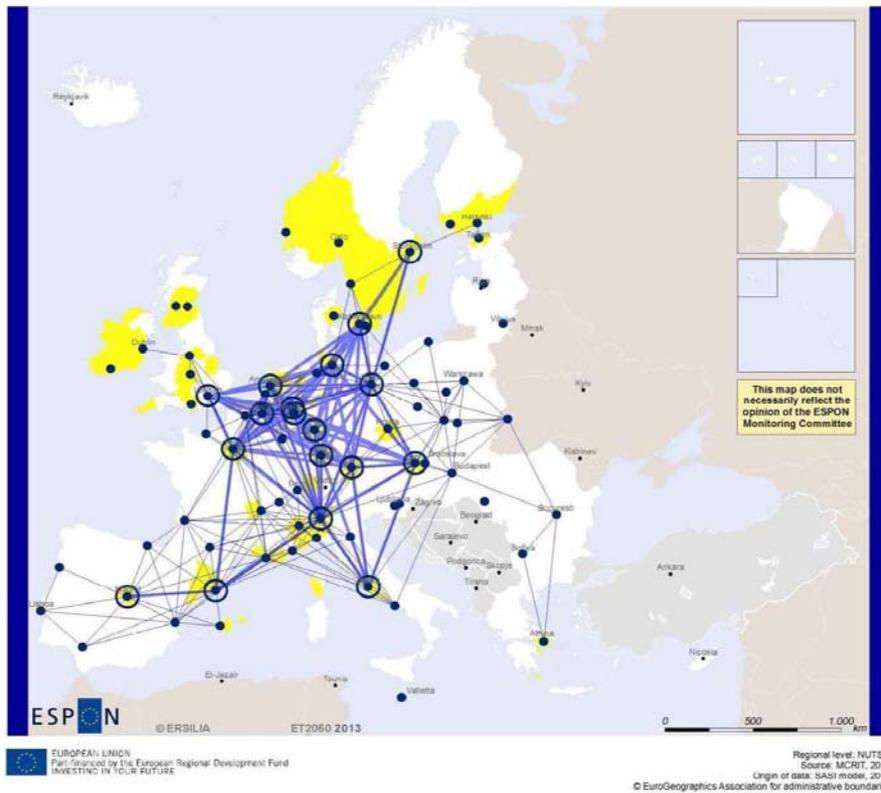


Illustration 2 Scenario A (Europe of Metropolises)³⁴

³³ The SASI model is 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. The SASI model differs from other approaches to model regional development by modelling not only production (the demand side of regional labour markets) but also population (the supply side of regional labour markets). SASI model is especially well prepared to analyse policy impacts in long-term scenarios since it is a dynamic integrated model.

³⁴

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)

60. **Europe of Cities (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.

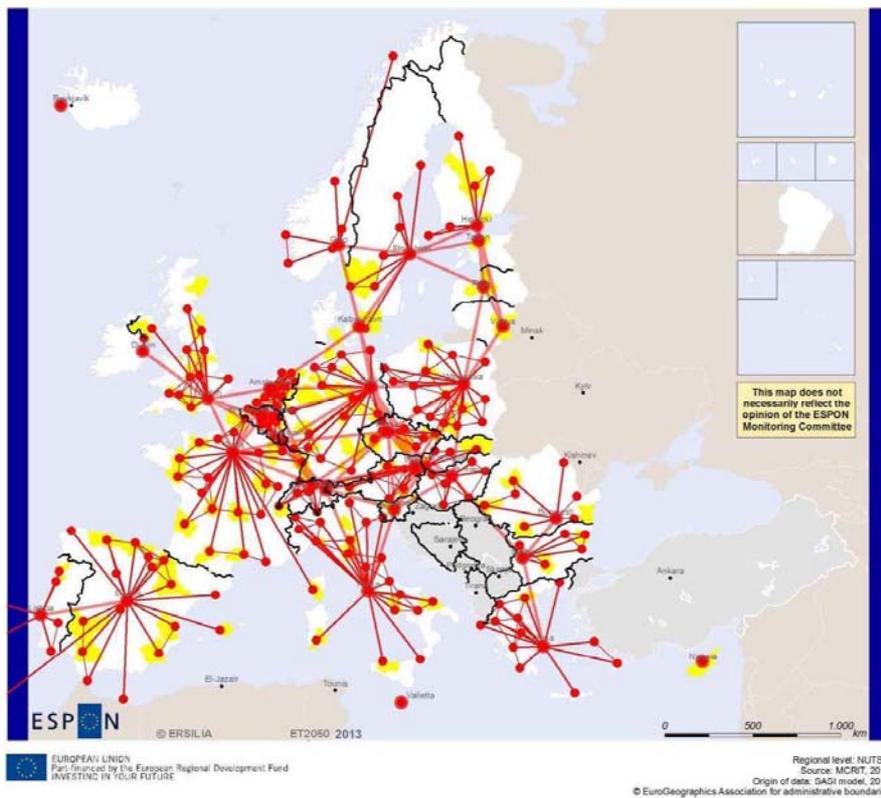


Illustration 3 Scenario B: Europe of Cities³⁵

61. **Europe of Regions (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 with more sustainable mobility patterns yet taking account of the necessary

35

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 <650km
- NUTS0-NUTS2 links intra NUTSO (except Germany and United Kingdom)
- NUTS0-NUTS1 links intra NUTSO (only Germany and United Kingdom)
- NUTS2-NUTS2 links intra NUTSO and length <200km (except Germany and United Kingdom)
- NUTS1-NUTS1 links intra NUTSO and length <200km (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)

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 neighborhoods. 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 behavior favoring 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.

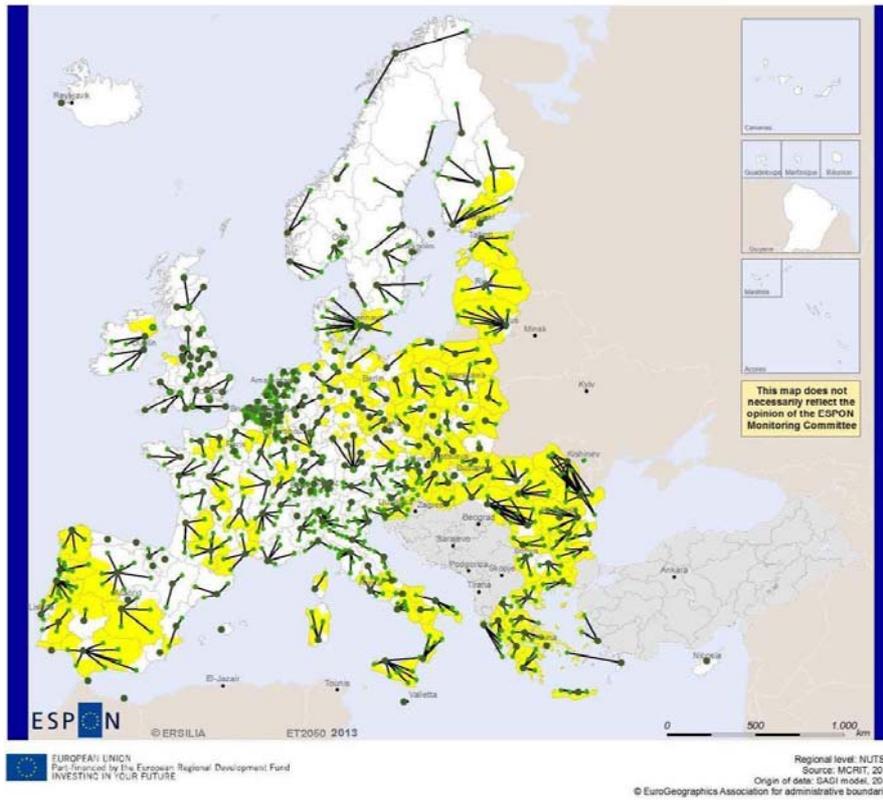


Illustration 4: Scenario C (Europe of Regions)³⁶

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 Strategies

62. ***The overall economic growth of Europe is not much affected by territorial policies:*** Economic growth in the long run is not significantly affected by the promotion of any of the three territorial scenarios presented (A, B and C)³⁷. 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 small cities in more peripheral regions³⁸. Economic development mostly depends on technologic changes leading to increases in productivity as well as in market regulation, and public policies in non-territorial fields 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 whole³⁹, under the same framework conditions, meaning that, under these conditions, agglomeration economies will have a relatively minor role as growth driver.

63. ***Regional development gaps are significantly reduced by territorial policies.*** Policies allocating European funds into second tier cities and peripheral regions as defined in B and C scenarios, and systematic public investments to increase their infrastructure endowment, are effective to reduce economic gaps without diminishing the overall economic growth, even if they are not above the current levels. Needless to say, a basic assumption is that European funds are allocated to support those services and infrastructures that most effectively contribute to increase the productivity of the regions.

64. ***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 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. Cities have to be encouraged to form networks that allow them to improve their performance in European and global scale.

65. ***Land-take increases.*** Scenario A, due to the attraction of the metropolitan areas, rural areas is not too much impacted by the expected land uptake. Also the development of high-rise buildings expected in this scenario will result in a densification of the urban areas and limit land uptake. Main threats of the large metropolitan regions are the diseconomies of scale, or negative consequences of size, such as mobility and quality of life issues such large developments are likely to bring, as well as a large urban sprawl in the sub-urban environments of these metropolises if Europe was to follow an urban development similar to that of e.g. the United States or Australia. 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. Main benefits of Scenario B will be the balanced growth throughout Europe and the ability to keep cities manageable. Cities are expected to fulfil an important

³⁷ The modelling of Exploratory scenarios by MULTIPOLES, MASST3, MOSAIC and METRONAMICA for 2030 (with insights for 2050) is complemented with the modelling 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.

³⁸ 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.

³⁹ 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.

interaction with their hinterland and thus provide a balanced landscape in which both urban and rural areas can thrive. In the scenario C it is expected a bottom up approach to maintain the rural areas. Main benefit of Scenario C is the ability to maintain and protect valuable ecosystems, and enhance a vibrant hinterland. It is the scenario where most policy interventions are required. Good stewardship of the land and cohesion are promoted through stimulating Less Favoured Areas. Main threat of Scenario C is an increasing fragmentation of the landscape due to less dense urban developments throughout Europe.

Territorial Vision: Open Polycentric Development

66. **Open Polycentric Development.** 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. It is by networking wisely cities and regions at all scales, from regional to global, that the opportunities to valorise its own endogenous assets is feasible. The territorial pathway making Europe smart, inclusive and sustainable, is based on making the European territory open and polycentric.

67. **Polycentricity at all scales.** A gradual evolution towards more polycentricity at all scales across Europe, sensitive to the geographic conditions of each territory, making sure that no city or region is left behind, will achieve the best regional balance without diminishing economic growth. The desired territorial evolution for Europe would follow a completely different path than the rest of the world, instead of letting large Metropolis to expand and grow forming even larger Megalopolis, policies must be focused to renew cities, linking them at both local and global scale. European territorial policies should avoid cities becoming fast growing megalopolis hosting several millions of people and activities clustered in low dense zones of discontinuous urbanisation, fragmented in segregated zones and connected to specialised networks.

68. **Promotion of Second Tier Cities.** Europe is a continent of cities. European Second Tier Cities must remain places of attraction and engines of economic growth with a high degree of social cohesion; platforms for democracy, cultural dialogue and diversity; places of green, ecological or environmental regeneration;. This fundamental decision for the further development and promotion of the balanced polycentric urban-regional system of Europe need to be supported by accompanying strategies in related fields of spatial planning.

69. **Compact Settlement Structure.** Europe has to avoid urban sprawl and promote social mix in neighbourhoods and at school through all appropriate means, favour 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; strictly protect the blue-green infrastructure; be more flexible in zones dedicated to economic activities and residence; irrigate residential areas with public transport and slow traffic (pedestrians/cyclists) infrastructure while reducing car traffic speed and land take; adopt a holistic model of sustainable urban development; integrate policies vertically (between decision-making levels), horizontally (between sector policies) and geographically (transcending administrative boundaries, e.g. those of municipalities) while deeply involving citizens.

70. **Protecting Sensitive land.** Most valuable land under urbanisation stress has to be protected by different policy measures, from stimulating owners not to urbanise in the coming decades to the establishment of European funds to support local and regional authorities to buy strategically.

71. **Developing a Green Infrastructure across Europe.** 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.

Sustainable agricultural practices must be promoted throughout Europe, including both sufficient income levels and good stewardship of the land. Productive agricultural soils and high quality nature need to be well-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.

72. *Valorising Cultural Landscapes and Social Capital as Key Assets* The valorisation of the cultural heritage and the quality of the landscape, including aesthetics, as well as favouring social inclusiveness and tolerance, become essential economic assets to make rural places more attractive for people to live and work, particularly for creators and entrepreneurs. In this sense, urban migrants arriving to predominantly rural areas can be an important asset to develop alternative activities and promote economic innovation. The proper management of the attractiveness of a given place always requires reinforcing local partnership. Reforestation and the reclamation of agricultural land are possible development paths in less densely settled and/or depopulating regions. River basin management and flood control will stay a vital cross-border issue, involving both EU member states and the closer neighbourhood.

73. *Supporting Less Developed Regions* Regional economic development must be based on the exploitation of endogenous assets. Tourism, renewable energies and networks of SMEs, natural resources and cultural heritage, are important assets for a more diversified economic development, as well as industrial and technologic activities linked to agriculture.

74. *Sufficient Accessibility to open up regional potentials.* There is a need to provide sufficient transport services and infrastructure not only to make a given territory attractive to exogenous investments but mostly to increase the productivity of endogenous activities. Transport investments, as well and any other infrastructure, need to be cost-effective, based on realistic future development scenarios, and be valorised by territorial development plans defined accordingly. Excessive investment on infrastructure results on market distortions and have important opportunity costs associated, as well infrastructure scarcity heavily constrains development.

75. *Co-development with Neighbouring regions* Co-development strategies are needed to reduce political conflicts and take advantage of the market dimension and R&D capabilities of the European Union countries, with the energy, resources and labour on the South shore of the Mediterranean, as well as Eastern Neighbourhood. The prospect of fast growing freight and passenger demand between the two shores of the Mediterranean would require major new infrastructure to be completed.

76. *Improving Global Connectivity.* During the next decades the European market will be increasingly open to the rest of the world and viceversa, and trade between European countries and the rest of the world may be as large as among them. Global connectivity through maritime routes and intercontinental air services will be an increasingly important factor of territorial competitiveness. The further increase on global trade will create new development opportunities in cities and regions peripheral in Europe but well located as a global hubs linking Europe with Asia, as well as with South-America and Africa, since nowadays still largest ports and airports are concentrated in the North of Europe, mostly for historical reasons.

77. *Mitigation and adaptation 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, the opening of new

shipping routes in the Arctic, enhanced forest growth, increased crop variety and yield and additional summer tourism in Northern Europe.

78. **Resource efficiency.** The EU will embrace green taxation wholeheartedly, with the purpose to reduce emissions, reduce imports of energy and raw materials and address unemployment. In addition, the EU enacted a raft of binding legislation on energy and resource efficiency based on steadily improving best available technologies.

79. **New self-organised governance.** Information and Communication Technologies will facilitate that groups will gather together more easily for a given project at a given moment. Protesters may subvert formal social institutions and governments, but hardly can be successful implementing a given project. The very nature of governance and participatory democracy, territorial governance as such, will have to be redefined. Children and teen-agers feel more familiar to new technologies than their parents and teachers, adults in general, and this is redefining the concept of authority, either religious, political or scientific. Social institutions such as churches of different national denominations, the political parties and trade unions or national academies of science and professional associations will evolve.

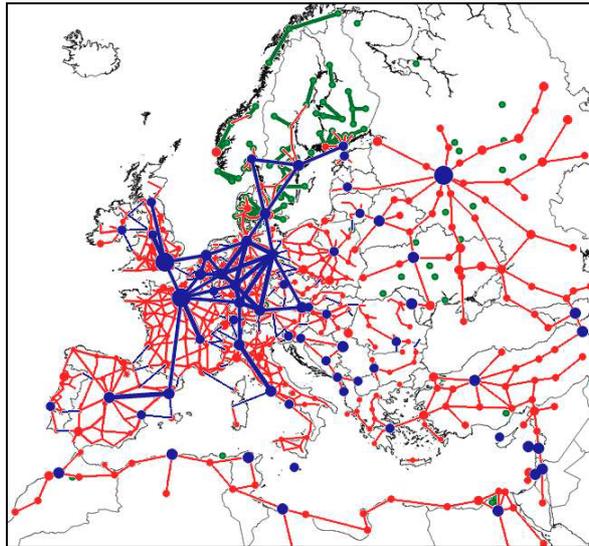


Illustration 5 Territorial Vision in 2020

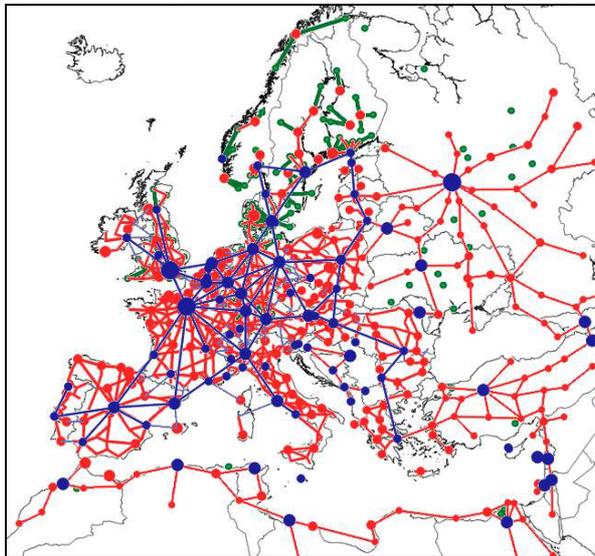


Illustration 6 Territorial Vision in 2030

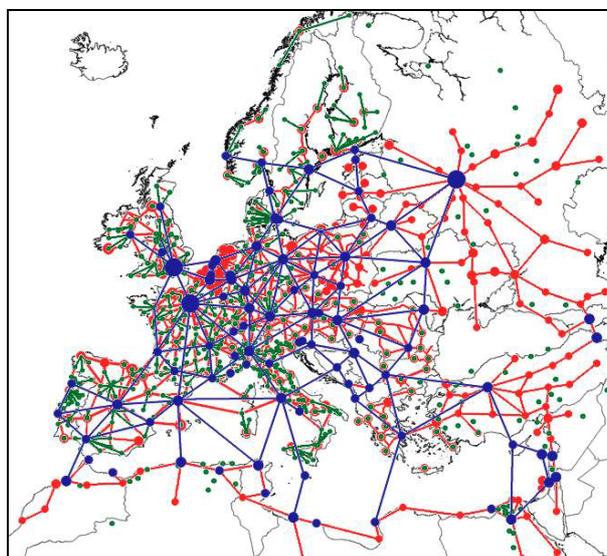


Illustration 7 Territorial Vision in 2050

A New Generation of Cohesion Policies

80. ***A new generation of Cohesion Policy in needed***⁴⁰. Cohesion policy should be refined to make a more explicit recognition of the European regional diversity and the increasing difficulty of internal catching-up processes when European economies become more globally oriented. Territorial cohesion 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. Territorial strategies such as openness and global connectivity seem as important as resilience and place-based attachment. The overall task assigned by the EU Treaty to Cohesion policy “to promote overall harmonious development” – and the goal of reducing disparities and backwardness of regions – has to be interpreted and applied considering both the efficiency and equity dimensions of development, and establishing two interdependent although very different missions: all regions must be given the opportunity to achieve their full potential, and all citizens must be given the opportunity to live a life worth living independently of where they live (*territorial cohesion*). In so doing, the cohesion policy acknowledges that “convergence” of per capita average GDP of regions is an inappropriate proxy of the two missions, and that disentangling the two missions and transparently pursuing them as a part of a unitary, comprehensive strategy was a key prerequisite for improving the effectiveness of the cohesion policy.

81. ***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 territorial challenges and promoting territorial cohesion. New approaches to Territorial governance should aim at reifying new “softer” spaces for policymaking. The future development path of territories with geographical specificities needs to be associated with the success of the process of European territorial integration. 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 (SGI). Social funds will tend to be better linked to urban redevelopment plans and targeted to deprived areas and neighbourhoods with social tensions. More integration between Cohesion policy and other sectoral policies, particularly Pillar II of the CAP, environmental and transport policies, is needed in order to create more leverages for regional development in spite of reduced financial resources available.

82. ***Local, regional and national institutional empowerment***. More active civil society, and empowered citizenship engaged in participatory democracy. Place-based towards renewal of cities, public spaces and cultural landscapes, socially inclusive, cosmopolitan. The European political project will progress gradually, first fiscal, budgetary and financial solidarity. The separation of “nation” and “state”, leading to states as institutions, focused on the efficient delivery of public services, according to subsidiary. Emphasis in the association of neighbourhoods as active partners association. Agreements with Russia, Turkey, Middle East and Maghreb Countries. Most effective policies will emerge by the initiative of local communities, emphasizing good governance and strategic thinking. Public policies empower local actors,

⁴⁰ A clear distinction has to be made between cohesion policy and other financial solidarity mechanisms put in place in the EU to tackle with 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 not primarily to redistribution (although some places may receive more from interventions than they contribute through taxation) but to trigger institutional change and to break inefficiencies and social exclusion traps through the provision of public goods and services (provided in integrated bundles as a result of an exogenous cohesion policy intervention).

even if difficult sometimes, and consider spatial, environmental and socioeconomic issues altogether, and address problems with an integral approach. This does not exempt Member States from their inherent responsibilities. The role of the EU will be promoting and facilitating these initiatives as well as evaluating their impacts. The EU has to provide an operational framework to encourage local bottom-up initiatives.

83. **Valorising Territorial identity.** Cultural differences between places are in risk due to the tendency towards the mass standardization of goods and processes. While large cities and metropolis are becoming more homogeneous culturally, many rural areas still retain traditional identities. Territorial identity becomes more relevant now, in a globalised economy, when territories have to differentiate themselves and become more visible and attractive to people and exogenous activities. People's attachment to place is more likely to happen when the place has identity. Territorial identity requires, however, a balance between openness and relative closure to achieve. The promotion of local social capital and territorial assets should facilitate less developed cities and regions to take advantage of the more limited catching up opportunities available in the coming decades. The global and local strands are mutually reinforcing and interlinked, and should therefore be developed in parallel to each other.

84. **Integrated open endogenous development.** Balancing European-scale policies defined at sectoral level, there is a need to promote strategic integrated planning at local and regional scale carried out by public institutions in cooperation with surrounding areas and involving social and economic stakeholders.

85. **Local and regional infrastructure endowment.** The European Transport Policy is mostly focused on the adoption of common regulation for the markets as well as on the implementation of large infrastructure projects under the Trans European Networks schemes. Cohesion and Structural Funds have been applied to finance most of these investments, which benefit large cities and corridors. Cohesion and Structural Funds should be allocated instead to local and regional infrastructure according to the actual needs of each territory.

86. **Land-use instruments to protect vulnerable areas and create a Green Infrastructure.** Peripheral regions are naturally tempted to use land as an asset, relaxing land-use regulations. Even if this strategy can be successful in the short-term to attract foreign investments and activities, it may have high environmental costs. Complementing Nature 2000, specific areas in more sensitive territories (e.g. river basin, coastal zones, islands) will be protected against further urbanization.

87. **Cooperation between regions**– New planning and territorial cooperation initiatives are needed at all geographic levels, open to networks of public and private institutions, attached to ad-hoc geographies (e.g. cross-border regions, mountain zones, coastal zones or islands, river basins, remote or sparsely populated regions, internal rural peripheries...). Solutions should not necessarily be found in designing new jurisdictions, rather policy delivery should be based on informal and flexible governance arrangements, such as “soft spaces”.

88. **Territorial integration in cross-border and transnational functional regions.** We consider that the integration of territories through territorial cooperation can be an important factor in fostering global competitiveness. In this way, potentials such as valuable natural, landscape and cultural heritage, city networks and labour markets divided by borders can be better utilized. Attention shall be paid to areas along external borders of the EU in this regard. We support transnational and cross border integration of regions going beyond cooperation projects and focusing on developments and results of real cross-border or transnational relevance.

89. **Investments in Neighbouring Countries.** Europe's dependency on energy will continue in the coming decades, even if it diminishes, and there will be a need for a better integration with energy rich

neighbouring countries, in co-development strategies beyond just buying oil and gas resources. On the other hand, the development of regions in the border of the European Union frontiers depends to a large extent on the conditions of the other side of the border. The promotion of integrated cross-border strategies, beyond security reasons, will avoid unnecessary competition and induce more specialization and complementarities'. Neighbouring countries are becoming emerging economies, and the interest of European companies to somehow integrate them into a Single Market will increase overtime.

90. **Sensitivity to economic cycles.** The impact of Cohesion policy is not independent of the macroeconomic conditions. The impacts of Cohesion and Structural Funds in Southern coastal regions having to invest the funds to build infrastructure in the middle of a Real Estate and financial Bubble are very different than the impacts the funds may have on Eastern regions in the context of a European overall recession.

European Reforms on Sectorial Policy

91. **Agricultural Policies** should be more focused on rural development and natural preservation. 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. Integrated rural development plans outside the agricultural sector will become much more relevant, particularly focussed on promoting tourism, improving commercial chains between producers and consumers, and promoting bottom-up public-private initiatives, at National and European level.

92. **Transport policies** have to better regulate markets and promote new technologies. Reducing mobility demand will not be an option, no forcing economically non sustainable modal shifts. The TEN-T Core Networks represent a major investment on long-distance infrastructure from 2012 to 2030 (€1,5 trillion), with a relatively dense rail networks for freight and passenger connecting all major airports and ports in the long-term. It is unlikely that this ambitious investment programme will be realised. Transport investments on infrastructures with low socioeconomic profitability will hardly be supported by European funds, even if they may have social or territorial cohesion interest. At urban level, decoupling mobility and economic growth is expected and urban policies will be focused on applying intelligent systems to manage mobility, increasingly carried out by public modes and more environmentally friendly individual modes; since noise, pollution and stress, may tend to be reduced, the centre of European cities will become more liveable, attractive and productive environments. Safety will be an increasingly important goal.

93. **Environmental Policies.** Environmental directives have been effective in imposing higher environmental standards across European countries and promoting the European environmental sector. European environmental regulations will be reinforced all economic sectors, particularly Real Estate, Energy or Transport. Environmental taxation may tend to be integrated into other taxations, and the *polluter-pays* principle generally applied at National level, based on common European criteria, generating additional revenues to be applied to environmental management. Plans for Natural Protection and Management will be one of few cases of permanent cross-border cooperation in Europe.

94. **Energy policies.** The Lisbon Treaty (2007) laid out for the first time the EU's competencies in the Energy area and the key objectives of energy policy. A Common Energy Policy is needed both to reduce market inefficiencies leading to excessive cost of energy and developing more integrated networks of production and distribution making Europe less dependent from outside sources.

95. **Migration policies.** 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 ...).

Territorial Governance⁴¹

96. **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 eighteenth century, European governance has to be redesigned the best possible way to promote sustainable and inclusive development for the next generations of Europeans.

97. **Increasing involvement of citizens in the European policy,** empowering local actors to a higher extent and considering spatial, 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.

98. **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.

99. **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

⁴¹ The chapter, together with the following one presents the "Second horizon" of the foresight exercise

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

100. ***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.

Monitoring Territorial Targets

101. ***Strengthening European spatial planning.*** Spatial planning in Europe has become increasingly trans-national. This requires a mandate for Europe for trans-national spatial 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 spatial 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

102. ***Territorialisation of European monitoring indicators.*** The periodic calculation 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 whenever possible, is needed for a more detailed understanding of regional specificities and a more sensitive and effective policy implementation. There is also a need to define specific 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

103. ***Population Change.*** The total amount of regions losing population (e.g. NUTS3) needs to be monitored. It is suggested that not more than 5% of European NUTS3 regions should lose beyond 7,5% of their population between 2010 and 2050. This 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). 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. The key question is about regions losing young/active population that migrates to find a job elsewhere. Hardly these regions losing active population -their most previous asset- will be able to catch up the development level of other regions. Both for cities receiving population and for areas being depopulated, the development opportunities and problems change quickly. Setting any target either on net migration (or net labour migration), or on fertility, is unfeasible (as it may restrict the freedom of movement or freedom to decide about the number of children).

104. **Regional Economic Gap.** The relative distance in GDP per capita between wealthiest European regions and laggards is a useful indicator of the difference between economic development across European territory, still high if compared for instance with the USA or Japan. 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. However GDP is not capturing fundamental wellbeing conditions and remains contradictory from economic point of view, and a complementary indicator of territorial efficiency would need to be also defined.

105. **Accessibility.** 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 minutes⁴². 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, even if potentialities from improving accessibility depend on the previous competitiveness of the regions concerned, being some regions liable to lose out as they become more open to competition from elsewhere.

106. **Compact Settlements.** 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.

⁴² Regional Focus 01/2008

ANNEX: TABLES, FIGURES AND MAPS

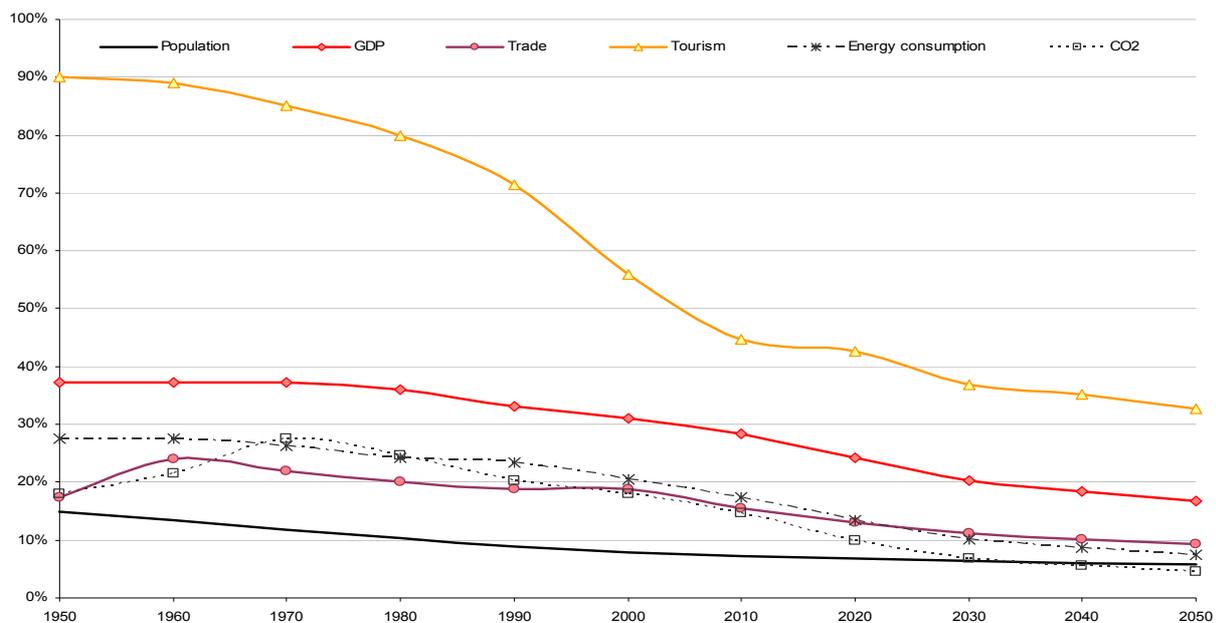
Europe in the World 1950-2050

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 1950-2050⁴³
(European share at World level)



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

⁴³ 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 ⁴⁴ , 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 ⁴⁵ 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.

⁴⁴ General assumption for all scenarios on European transport investment: 0,9% in 1995; 1,2% in 2007; 0,6% in 2015

⁴⁵ 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

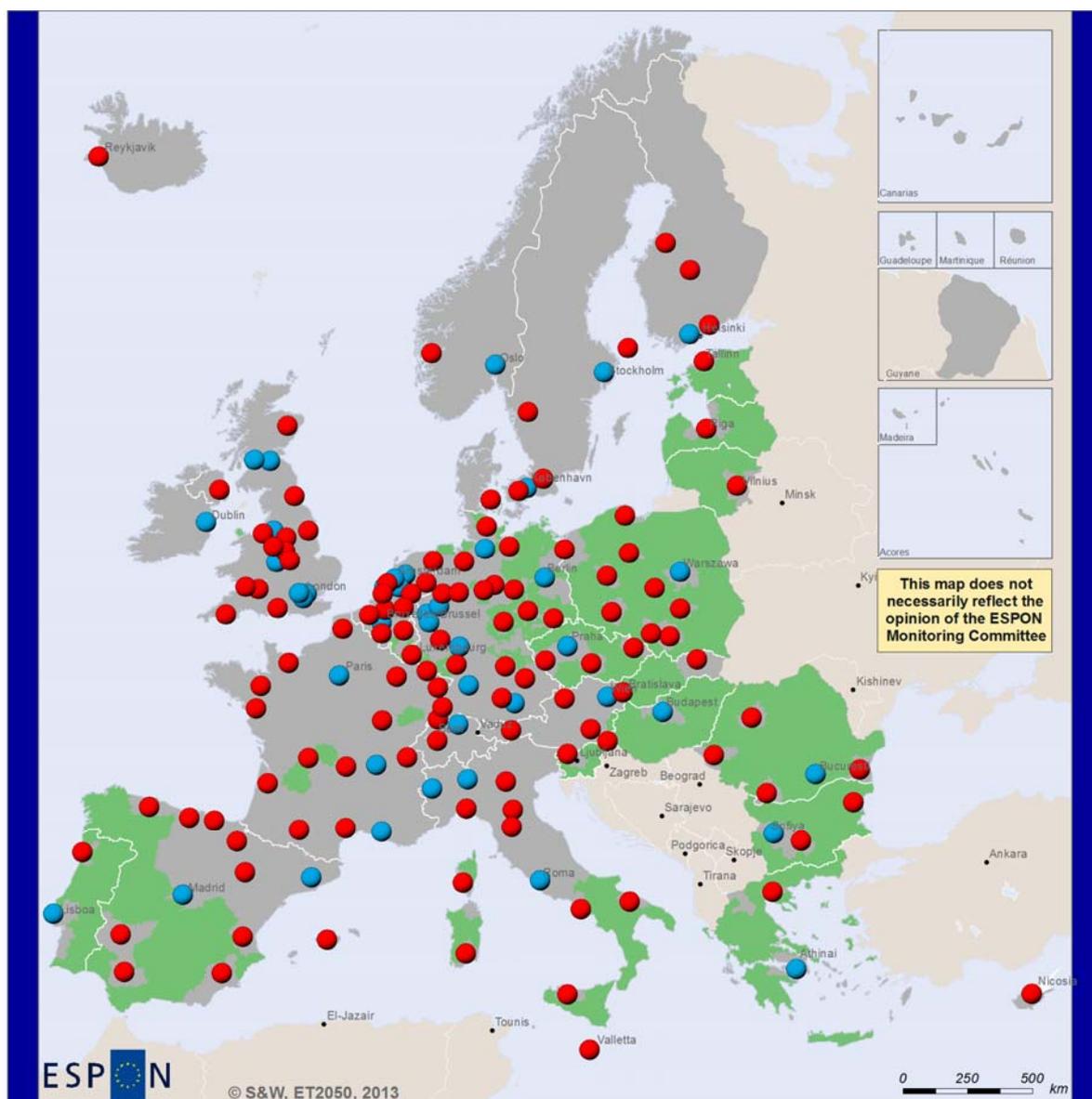


Illustration 8 Areas promoted in the A (blue), B (red) and C (green) Scenarios

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: spatial orientations and extreme framework conditions

Spatial 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%

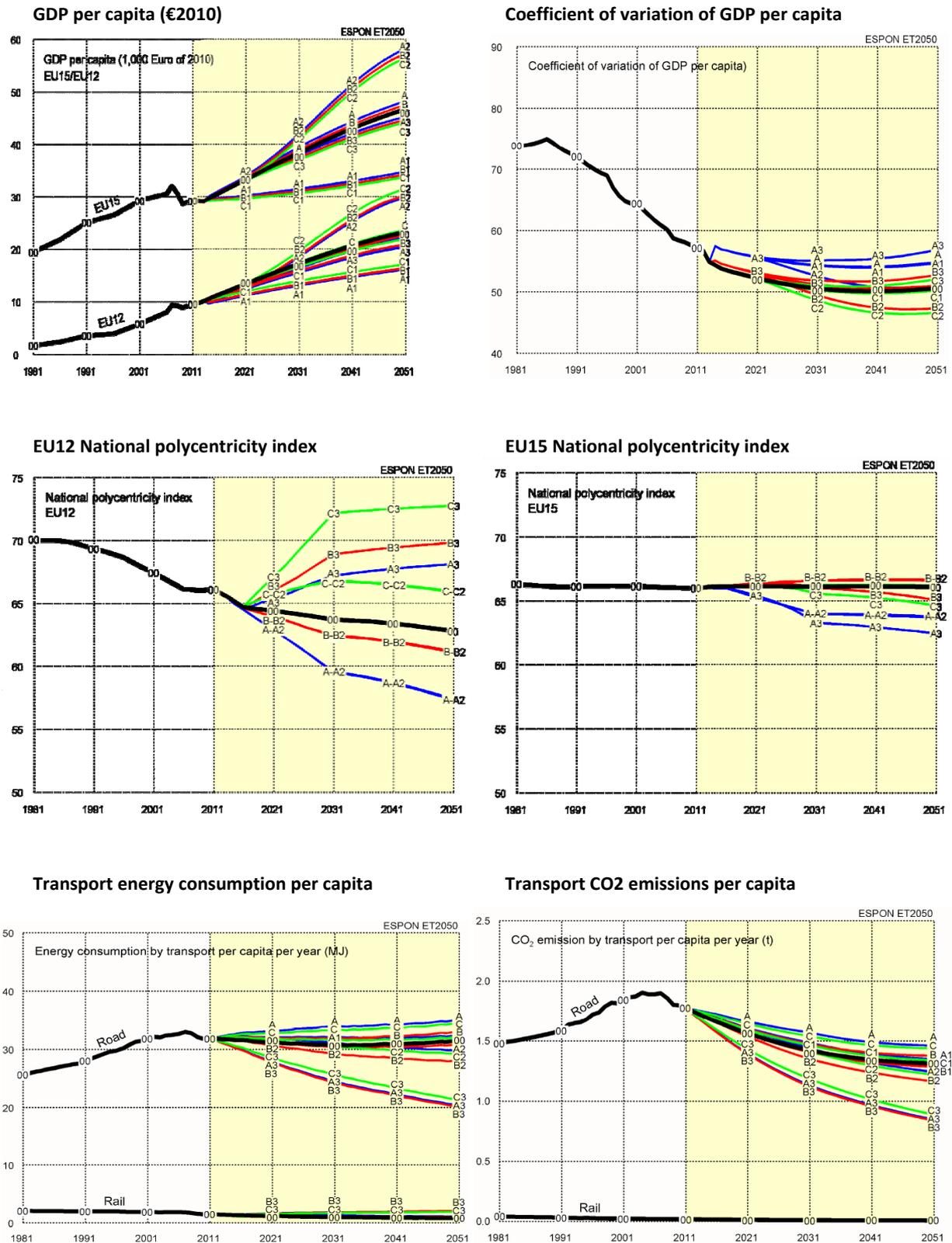
Source: SASI

Table 8 - Results for main indicators

	2050												
	Reference Scenario	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 (tonnes/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	Compact Settlements	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

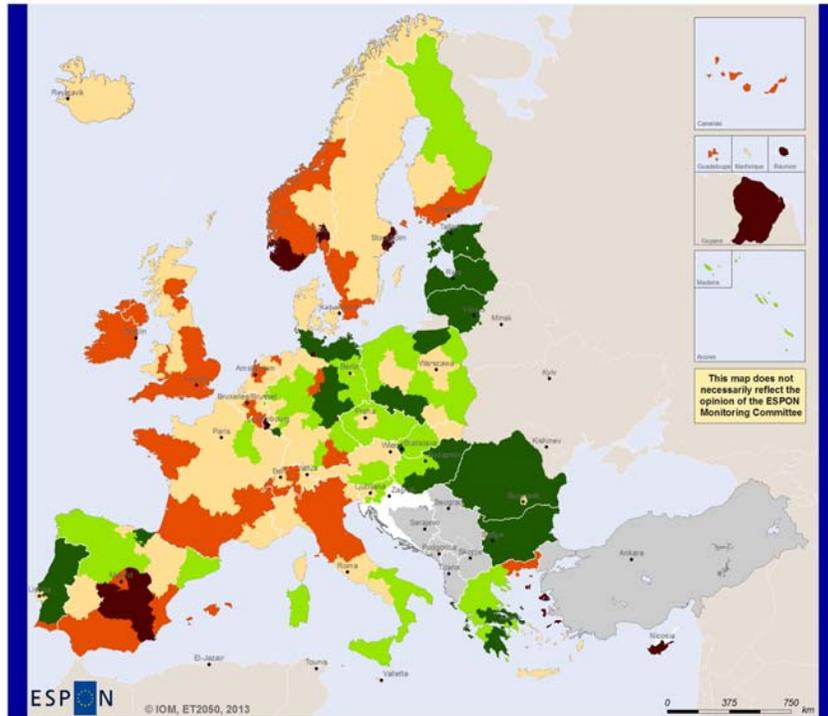
Topic	Source	Target	Unit	Target Year	2010 - 2050 path to target				
					2010	2015	2020	2030	2050
Land use	The Roadmap to a Resource Efficient Europe - "The Roadmap" (Proposed, yet not adopted target)	Average annual land take, from additional 920 km2 per year in 2000-2006, to 800km2 in 2020 and 0km2 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 an 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	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%

Topic	Source	Target	Unit	Target Year	2010 - 2050 path to target				
					2010	2015	2020	2030	2050
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%
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 ne 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 9 Evolution of macro magnitudes 2010 – 2030: population and gross domestic product

Population change 2010 – 2030 (Baseline)



Regional level: NUTS2
Source: IOM, 2013
Origin of data: MULTIPOLES Model
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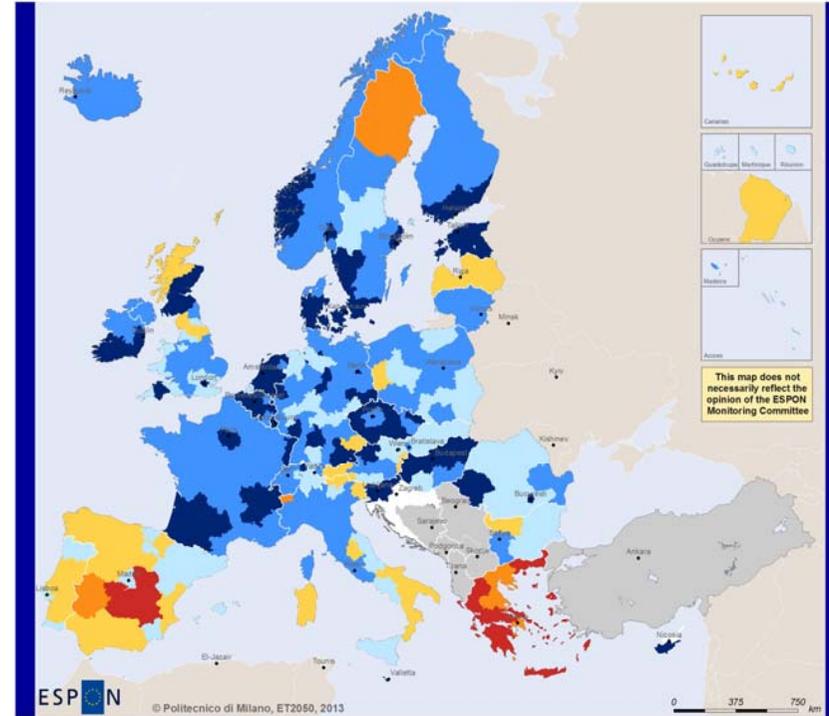
Annual population change (Units: %)

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)



Regional level: NUTS2
Source: Politecnico di Milano, 2013
Origin of data: MASST3 Model
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GDP Growth annual average rate (Units: %)

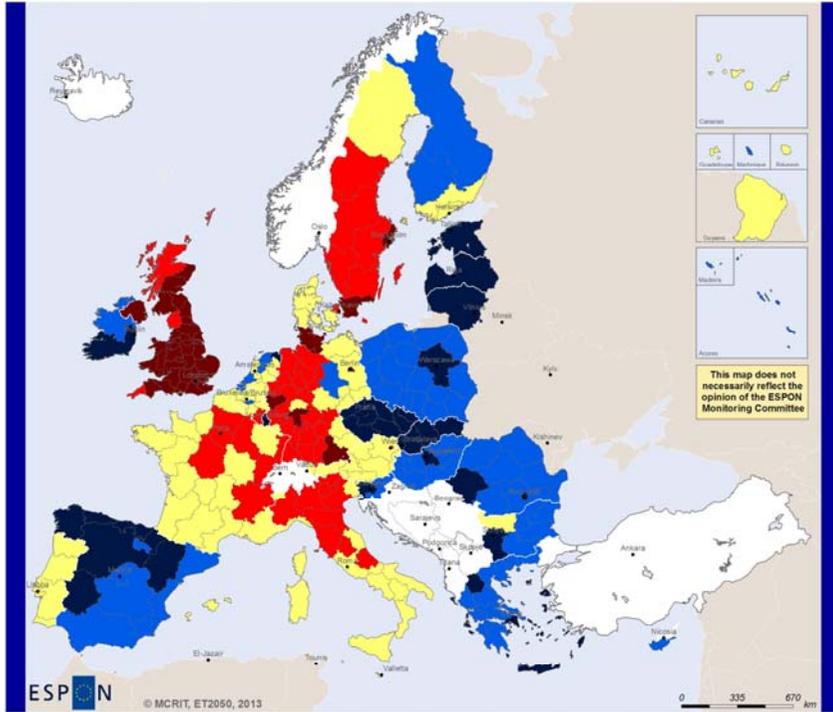
Results obtained by MASST3 forecast model

- < 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 10 Impact on GDP per capita: from regional convergence to increasing disparities after the crisis

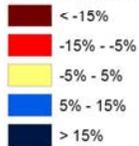
GDP per capita change 2000 - 2008



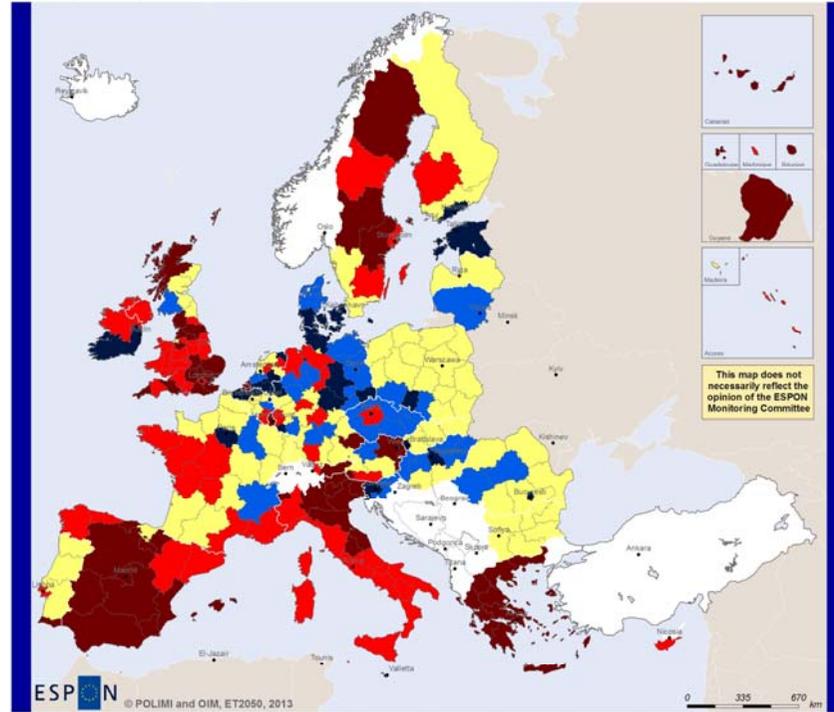
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Regional level: NUTS2
Source: MCRIT, 2011
Origin of data: ESPON DATABASE
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Relative change in GDP per capita growth in relation to EU27 average



GDP per capita change 2008 – 2030 (Baseline)



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

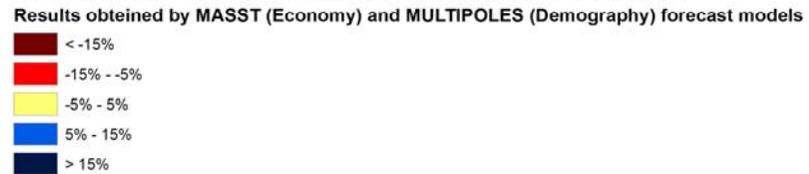
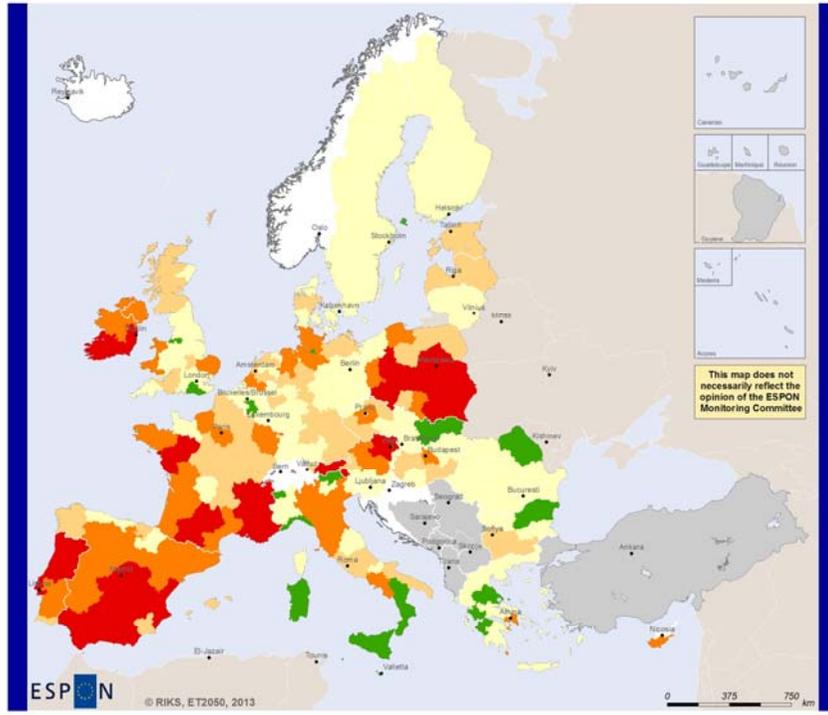


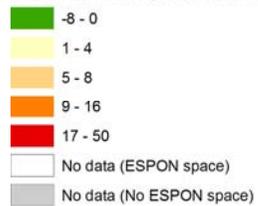
Illustration 11 Annual land take (Residential tourism not included).

Annual land take 2000 - 2006

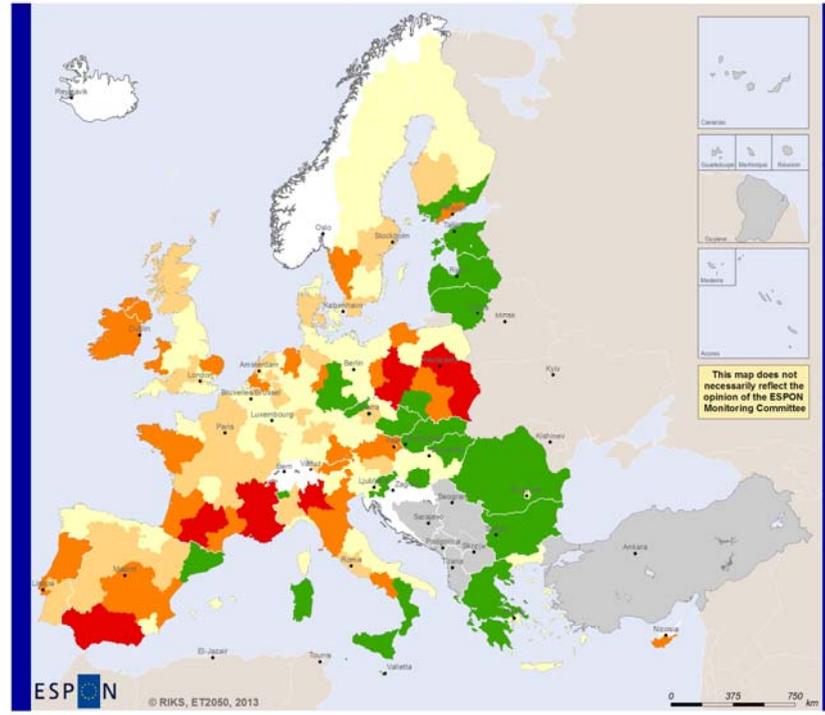


Annual land take 2000 - 2006 (Units: km²/ year)

Results obtained by METRONAMICA forecast model



Annual land take 2010 - 2030 (Baseline)



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

Results obtained by METRONAMICA forecast model

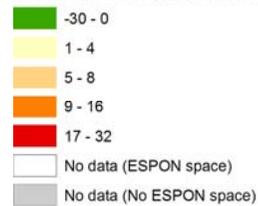
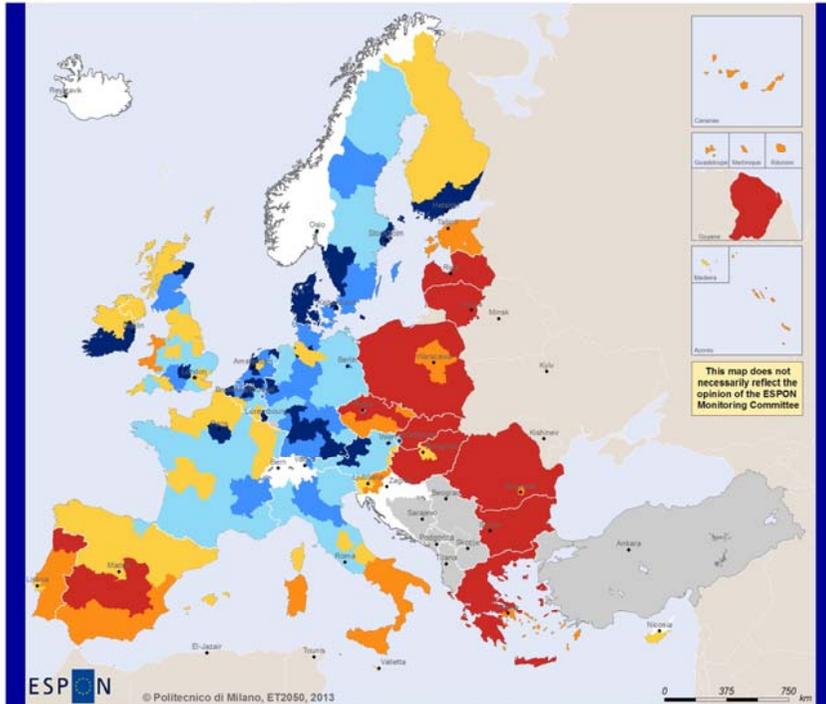


Illustration 12 Regional Economic GAP 2030 - 2050

Regional Economic Gap 2030 (B)

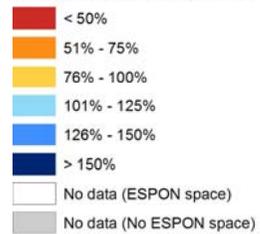


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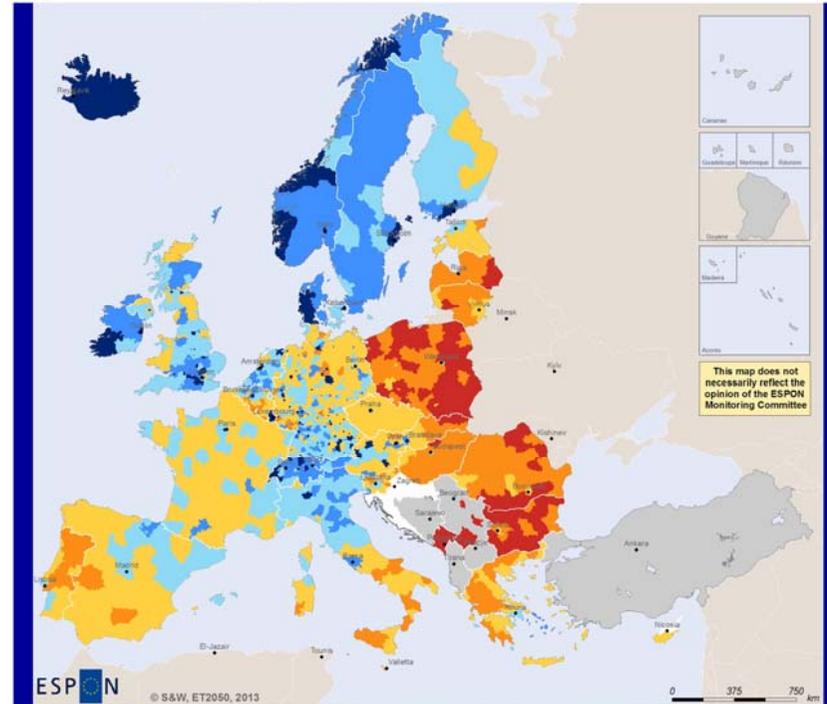
Regional level: NUTS2
Source: Politecnico di Milano, 2013
Origin of data: MAAST3 Model, 2013
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Dispersion from EU GDP per capita average 2030 (Units: %)

Results obtained by MASST3 forecast model



Regional Economic Gap 2050 (C2)



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Regional level: NUTS3
Source: Spiekermann and Wegener
Urban and Regional Research (S&W), 2013
Origin of data: SASI Model, 2013
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Dispersion from EU GDP per capita average 2050 (Units: %)

Results obtained by SASI forecast model

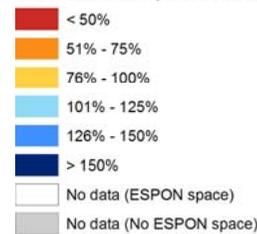
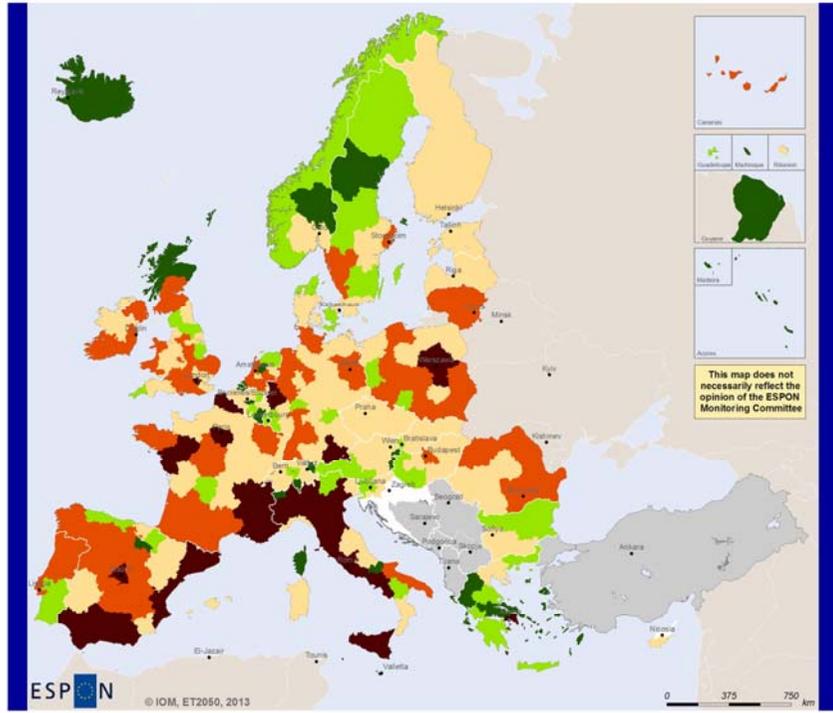


Illustration 13 Population change 2030 - 2050

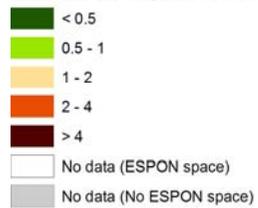
Total Population in 2030 (B)



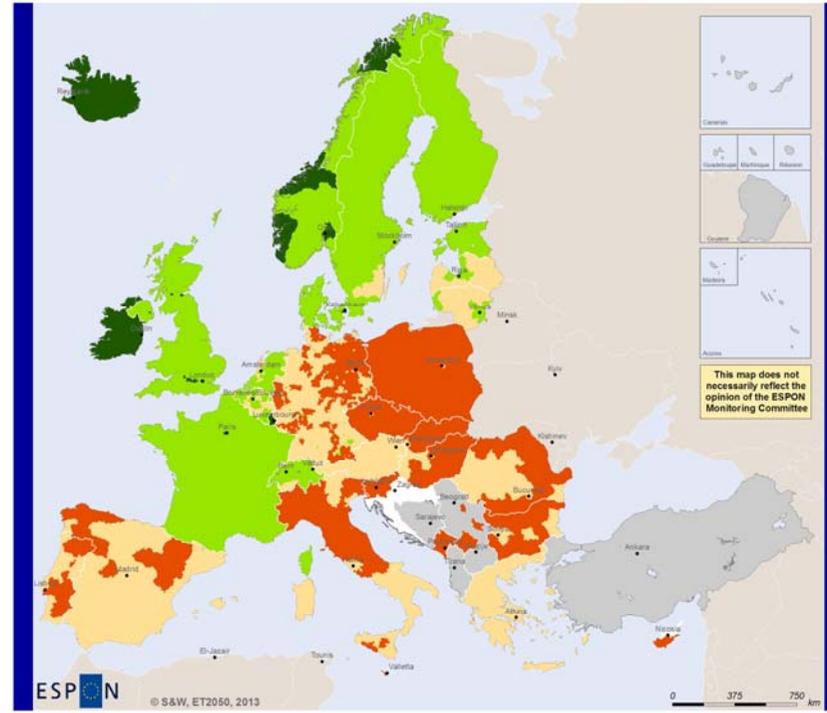
ESPON
 © IOM, ET2050, 2013
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 Regional level: NUTS2
 Source: IOM, 2013
 Origin of data: MULTIPOLES Model, 2013
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Population at regional level 2030 (Units: Million inhabitants)

Results obtained by MULTIPOLES forecast model



Population Change by 2050 (C2)



ESPON
 © S&W, ET2050, 2013
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 Regional level: NUTS3
 Source: Spielmann and Wegener
 Urban and Regional Research (S&W), 2013
 Origin of data: SASI Model, 2013
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Total population change (Units: %)

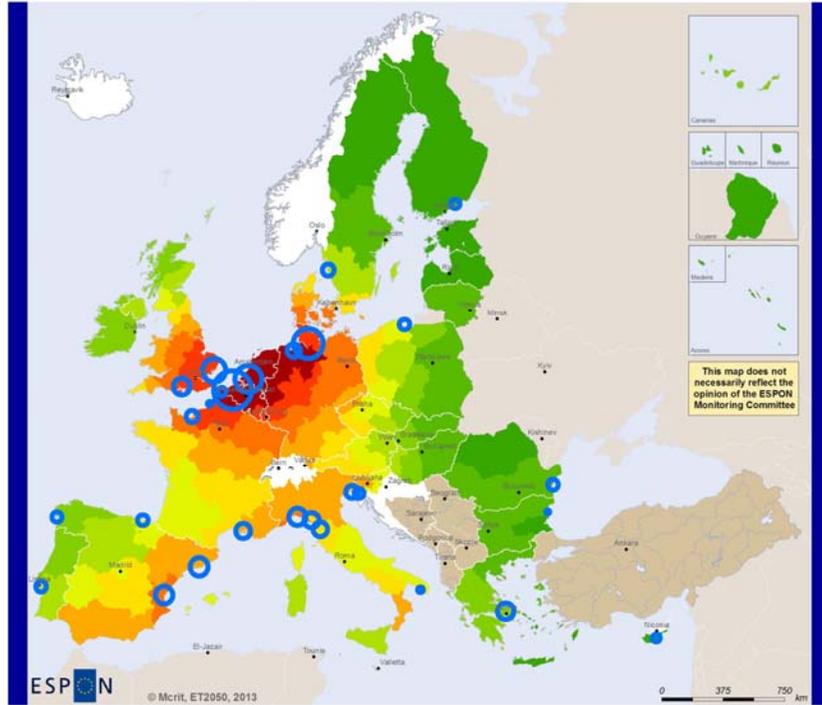
Results obtained by SASI forecast model



Illustration 14 Global accessibility 2030 - 2050

Global freight accessibility 2030 (B)

Potential accessibility to large commercial ports



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 Regional level: NUTS 2
 Source: Moit, 2013
 Origin of data: Moit, 2013
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Global freight accessibility (Units: weighted TEUs) Port extraEU27 container traffic Mtor

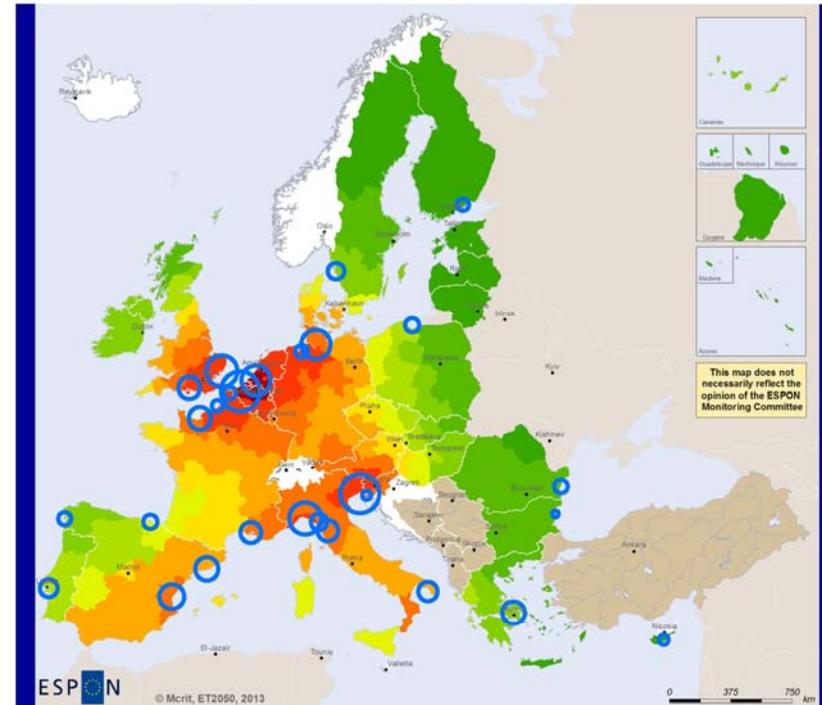


Potential accessibility to standardised containers receptioned or sent outside the EU27 in European ports (unit: weighted TEUs).

Potential formulation as $A_i = \sum W_j \cdot \exp(-8c_{ij})$, with W_j TEUs handled at ports contained in destination NUTS2 j ; c_{ij} travel time to reach j from i in minutes

Global freight accessibility 2050 (C2)

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



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 Regional level: NUTS 2
 Source: Moit, 2013
 Origin of data: Moit, 2013
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Global freight accessibility (Units: weighted TEUs) Port extraEU27 container traffic Mtons

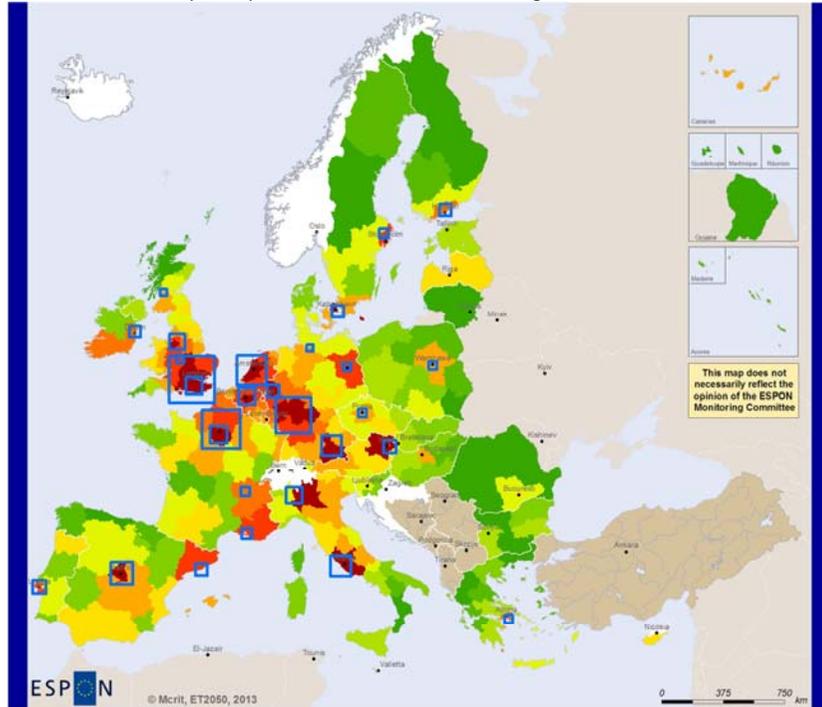


Potential accessibility to standardised containers receptioned or sent outside the EU27 in European ports (unit: weighted TEUs).

Potential formulation as $A_i = \sum W_j \cdot \exp(-8c_{ij})$, with W_j TEUs handled at ports contained in destination NUTS2 j ; c_{ij} travel time to reach j from i in minutes

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

- 311 - 50.000
- 50.001 - 100.000
- 100.001 - 200.000
- 200.001 - 400.000
- 400.001 - 700.000
- 700.001 - 1.000.000
- 1.000.001 - 2.000.000
- 2.000.001 - 3.000.000
- 3.000.001 - 5.000.000
- 5.000.001 - 43.042.574

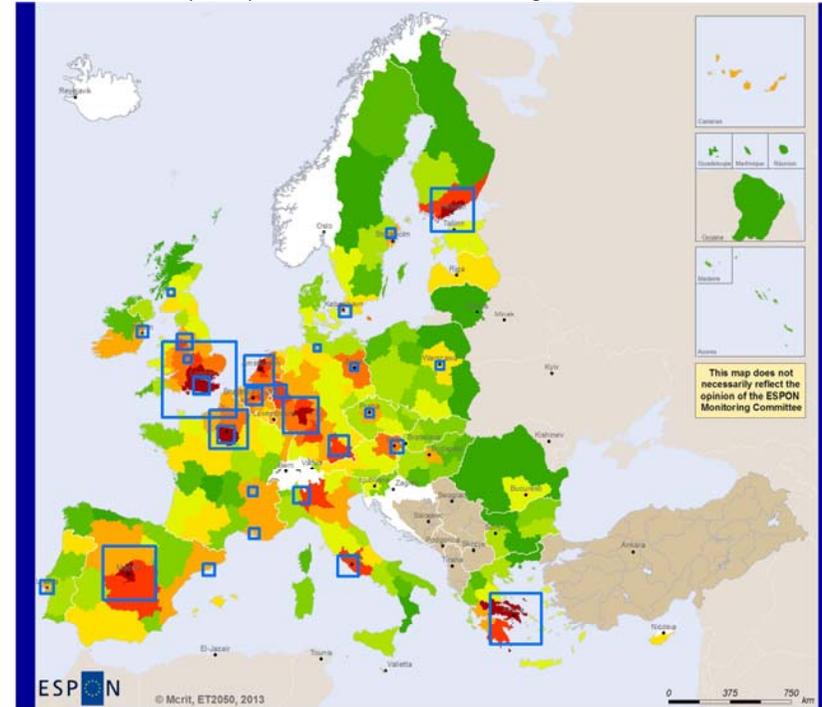
- 1.000.000
- 5.000.000
- 10.000.000

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

Potential formulation as $A_i = \sum W_j \cdot \exp(-0,02 c_{ij})$, 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

- 311 - 50.000
- 50.001 - 100.000
- 100.001 - 200.000
- 200.001 - 400.000
- 400.001 - 700.000
- 700.001 - 1.000.000
- 1.000.001 - 2.000.000
- 2.000.001 - 3.000.000
- 3.000.001 - 5.000.000
- 5.000.001 - 49.213.871

- 100.000
- 1.000.000
- 10.000.000

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

Potential formulation as $A_i = \sum W_j \cdot \exp(-0,02 c_{ij})$, 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.