ESPON project 3.2
Spatial Scenarios and Orientations in relation to the ESDP and Cohesion Policy

Final Report
October 2006

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Volume 2
Integrated Scenarios

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

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1. Introduction

This volume contains the main results of this project: the integrated scenario base and scenarios. They synthesise the results of 3 years of work trying to comprehend and digest the vast amount of information concerning trends, driving forces, projects and policies needed to analyse the complex mechanisms of territorial development in Europe. They also contain the results of the multiple debates both within the team and with the ESPON Monitoring Committee, the ESPON community as a whole and external experts.

The foundation on which these scenarios were built is the integrated scenario knowledge base which is a synthesis of the current state of knowledge concerning territorial development in Europe (chapter 2). This integrated base is mainly based on the thematic scenario knowledge bases which are presented in Volume 3 of this Report.

In order to explore the future evolutions of European regions and the overall spatial structure of the ESPON space, the team, in collaboration with the ESPON Monitoring Committee, decided to elaborate three roll-forward scenarios - one baseline (chapter 3) and two prospective policy scenarios (chapters 4.1 and 4.2) – and one proactive scenario (chapter 7).

Our scenarios provide a general vision of possible evolutions of the European policies and territory, with a territorialisation at the meso-scale represented by the Interreg 3B areas. As the scenarios had to cover the entire ESPON space, it was obviously not possible to provide sound prospective images for the micro-scale, i.e. the national to local levels. In the last phase of the project three different attempts were made at providing such "downscaling" for selected case study regions and using different methodologies. They are presented in chapter 5.

The above scenarios explore the evolution of the European territory as a result of specific policy choices. They, therefore, focus on the impacts of these choices on the territory, without taking into account possible other events that might influence this territory, and that might do so differently according to the policy choices made. It would obviously be impossible to imagine and elaborate story lines for all possible events that might occur. We have, therefore, decided to choose four "wild cards" and to very briefly evaluate what the impact of these events would be on the territory in the context of each of the two opposing policy scenarios (chapter 6).

Finally, based on the scenarios, the team has elaborated a series of policy recommendations which seem necessary if the image described in the proactive scenario is to be reached. They are presented in chapter 8.

Building the scenarios

From the outset it was decided to develop a scenario approach combining qualitative and quantitative techniques. This is particularly true for the integrated scenarios, described in volume 2. In order to develop these scenarios the outcomes of literature reviews, creative thinking, and workshops have been combined with data bases and the outcomes of model calculations. The thematic scenarios, described in volume 3, are mainly of a qualitative nature. The main steps of the applied scenario approach are:

- *Making thematic scenario bases*: collecting and integrating for each theme a wide range of information sources in order to understand the past and present trends and driving forces and in order to be able to explore the future development of the theme in a realistic way.

- *Building thematic scenarios*: elaborating for each theme two or more alternative policy scenarios taking into account the virtual context justifying the policy, the policy itself, its territorial impacts, and the final image of the EU.

- *Combining them into integrated scenarios*: using the thematic scenario bases to develop an integrated scenario base and using the thematic scenarios to feed the integrated scenarios, taking the mutual relations between the themes into account; supporting the qualitative integrated scenario with quantitative model results (see volume 4).

- *Testing the integrated scenarios*: using some different "wild cards" (low-probability-high-impact-events, like a very different exchange-rate between the euro and the dollar) to test the stability of the integrated scenarios and to introduce surprises.

The baseline scenario is based on the continuation of trends and on the principle that no major changes occur in main-stream and on-going policies applied which have played a part in shaping them. The prospective policy scenarios were defined using two "axes" of policy making, not necessarily opposing each other, but implying different priorities (see figure 1) : on one axis policy choices are lead by the desire for cohesion, on the other axis they are determined by the desire for competitiveness, including of Europe as a whole. The combination of the two priorities in a non-contradictory way was defined as the "ideal" situation and thus defined the final image of the roll-back scenario which aims at exploring possible paths (and contradictions on these paths) towards this ideal.

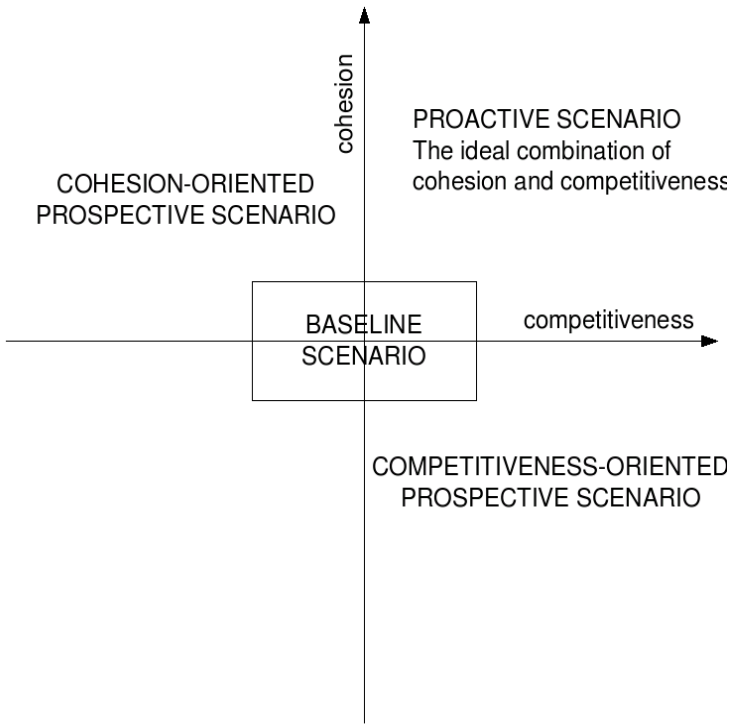


Figure 1 The axes defining the integrated prospective policy scenarios

2. Dynamics and driving forces: challenges for the European territory by 2006

Although spatial structures are known as being rather stable and not subject to rapid change, the present European and, more significantly, the global context is characterised by a series of factors likely to strongly influence the evolution of human settlements and of natural assets in the European continent in coming decades. Thus before entering into the speculative and explorative exercise of scenario writing, it seems appropriate to identify the nature of such contextual factors and driving forces as well as the way they impact the European territory at the current time.

2.1 Europe's new dimensions and its close and global environments

2.1.1 Towards a continental dimension

Even more than the preceding EU enlargements, the enlargement of May 2004 had a strong political dimension, as 8 of the 10 new member countries had spent four and a half decades of the post-war period under communist totalitarian regimes. In addition to the elimination of economic backwardness, the restoration and maintenance of political stability in the wider Europe was an essential objective. After the enlargement, the EU territory has nearly reached continental size, considering Bulgaria and Romania as the next member countries and the fact that close co-operation exists between the EU and Switzerland and Norway. The characteristics of the territory of the new member states, especially those of Central and Eastern Europe differ in various respects from those of the EU-15. In global terms, the EU-enlargement of May 2004 added 5% to the GDP of the EU-15 and 20% to its population, which means that the average GDP/head in the EU dropped by 12.5% on the very day of the enlargement. The enlargement fundamentally changed the scale of economic disparities within the EU. Only Malta, Cyprus, the Czech Republic and Slovenia had in 2002 a GDP per head, in PPS terms, above 60% of the EU-15 average. In Poland, Estonia and Lithuania, it was only around 40% of the average and in Latvia, just 35% of the average. The following cartograms (figure 2) illustrate the level of demographic and economic disparities in Europe in early 2000.

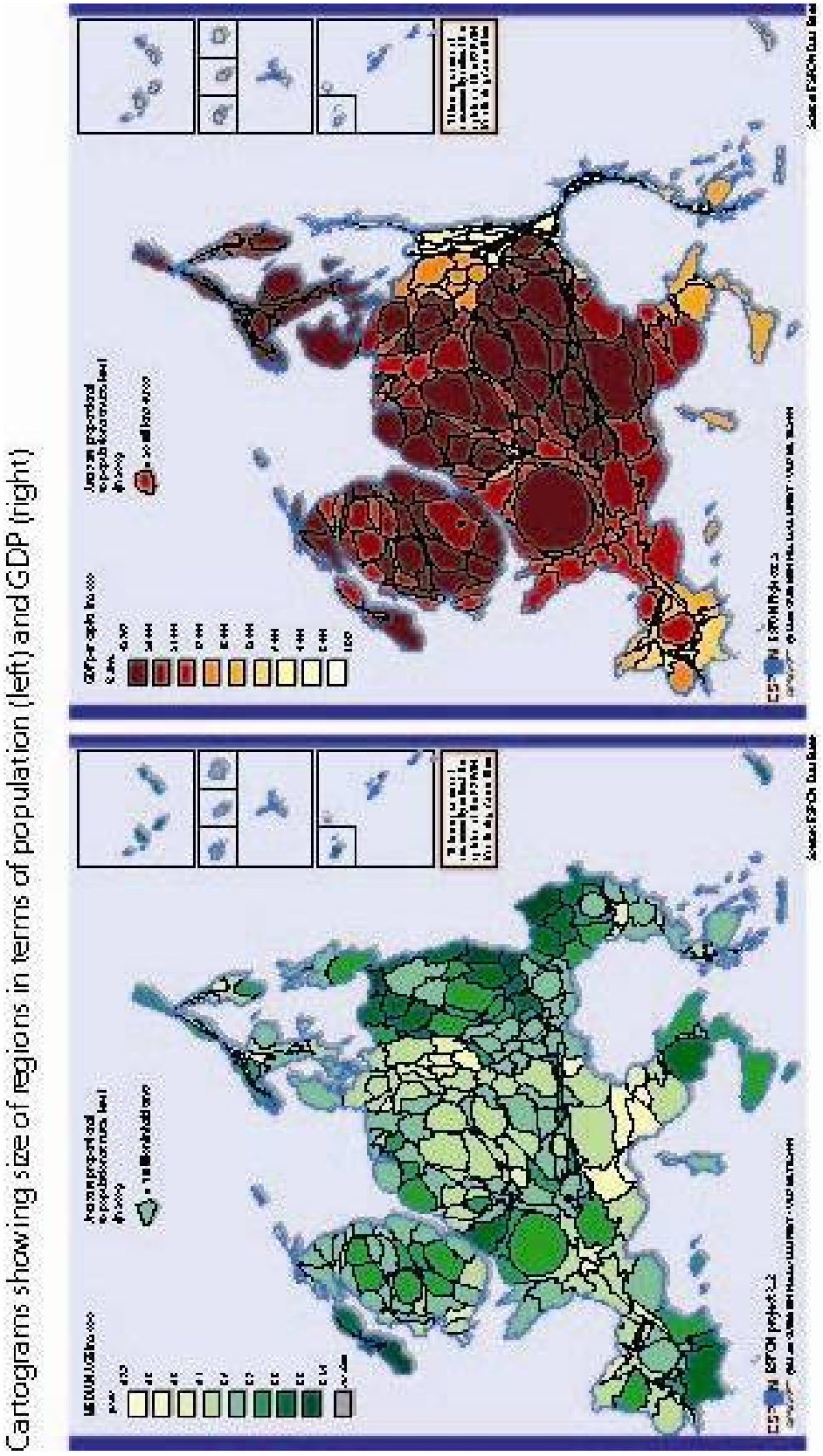


Figure 2 Cartograms showing size of regions in terms of population (left) and GDP (right)

2.1.2 Europe and its neighbours

Various types of disparities exist between Europe (understood as the ESPON area) and its neighbours[1]. In demographic terms, the southern and eastern Mediterranean neighbours, including Turkey, have considerably higher population growth rates than the European average and therefore a much younger demographic structure. Considering the eastern neighbours, the situation is just the opposite with extremely low fertility rates and a declining population. Immigration pressure towards Europe is rather independent from the geographical origin of the neighbour countries. Obviously, the southern and eastern Mediterranean countries play the most important part in this process. The migration flows from the Maghreb countries affect particularly France, Italy and Spain. Immigration pressure also originates from eastern neighbour countries, including the Balkans, mainly for economic reasons and irrespectively of the demographic situation, as well as from somewhat more distant countries, such those of Western Asia or Central and sub-Saharan Africa, the cause being a combination of demographic and economic factors. Various trends can be observed in the migration patterns towards Europe: the immigrants come from countries farther afield and originate from a broader spectrum of cultural, economic and social backgrounds; migration volumes are growing, especially in the case of female migrants. Immigration into Europe is composed of various types of flows: labour immigration, refugee immigration, family reunion immigration, student exchange programmes etc. Although the pentagon remains the privileged destination of external immigration, the European Mediterranean countries and regions are also significantly affected as are, increasingly, the new member countries of the E.U.

[1] This section is largely based on the Draft final Report of ESPON Study 3.4.1. "Europe in the world" coordinated by UMS RIATE (Paris)

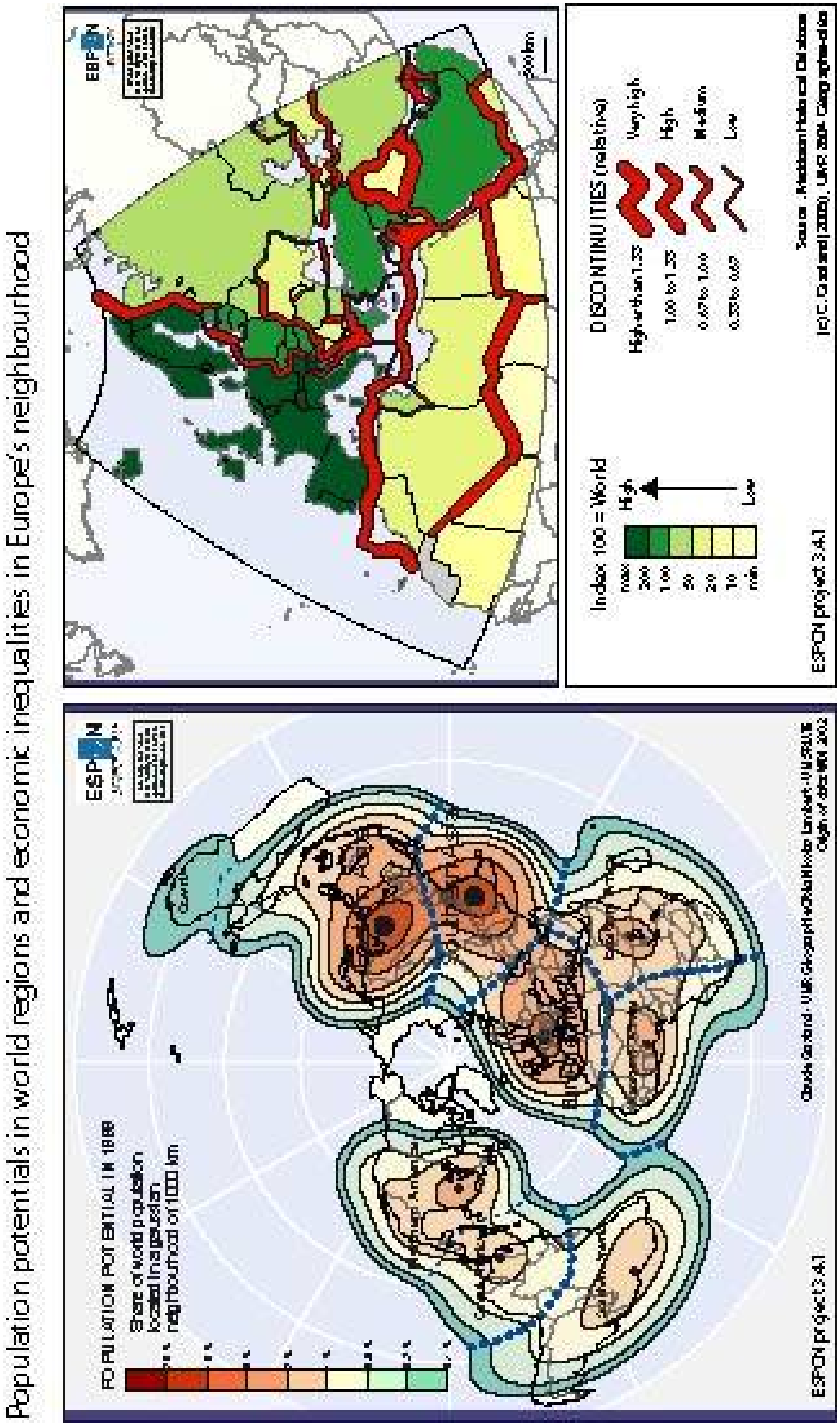


Figure 3 Population potentials in world regions and economic inequalities in Europe's neighbourhood

In economic terms, disparities between Europe and its eastern and southern neighbours are rather significant, so that Europe acts as a polarisation area as regards most neighbour countries, although the external economic exchanges of the EU with its eastern and southern neighbours are comparatively modest. A significant exception however, is the Russian Federation, the economic development of which is boosted by incomes from energy exports, especially towards Europe. Algeria, Libya and various CIS Republics are also economically linked with Europe through energy exports. As to the question of whether economic integration between the European Union and its neighbours is progressing, the answer is not homogenous. While there are signs of integration with the eastern neighbours, there is increasingly a north-south divide across the Mediterranean maritime border. Although over the long-term (half century), disparities have diminished between the European economy and the southern Mediterranean, the trend has been the reverse during the last decade. The MEDA countries are clearly experiencing an increasing gap with Europe. They are highly dependent upon West-European markets and investors, but are not significant partners for European exports and investments[2]. The geographical pattern of FDI is very similar. Although southern and eastern Mediterranean regions have attracted more foreign capital since the mid 1990s and the enforcement of the first Association Agreements, this has been much less than that attracted by Eastern Europe. Thus while Algeria and Egypt receive particularly low levels of FDI, recent years[3] (2004 and 2005) have shown rising levels in Turkey. Foreign investors now reach more easily new eastern countries such as Croatia, FYROM and even Georgia, Azerbaijan and Ukraine, because labour costs are lower than in the new member countries. Foreign investments are expected to reach also the former Yugoslavia (Serbia and Bosnia) when the region becomes stabilised.

2.1.3 Accelerating globalisation dominates most driving forces of territorial development

Europe's modest economic openness and specific foreign trade patterns

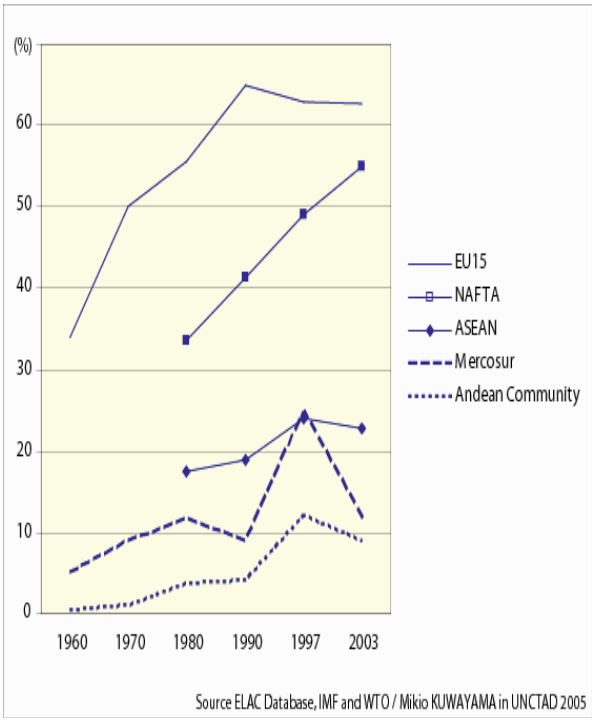
In economic terms, Europe (understood here as the ESPON area), with more than one fifth of the world GDP (PPS), still has a central place in the world[4]. This has however been declining, decreasing from nearly 29% of world GDP in 1952 to just above 22% in 1998. In demographic terms, Europe's share of the world's total population has been nearly halved, falling from almost 14% in 1952 to less than 8% in 1998. In terms of GDP/head (world = 100) however, Europe has improved its position (from 207 in 1952 to 282 in 1998), but much less than Japan (from 101 to 360), while the position of North America, although remaining at the highest world level, has slightly regressed (from 393 in 1952 to 371 in 1998).

With regard to world trade activities, Western Europe, with 23.7% of world trade during the period 1996-2000 (excluding intra-European foreign trade), has had roughly the same weight as the other economic blocks: 22% for North America and 21% for Asia. The openness of the major world economies (ratio between total trade and DGP at market prices) remains relatively low over time: 14.1% for EU-25 during the 1996-2000 period (14.3% for ESPON 29), 13.5% for the USA and 17.5% for Japan. This raises the question of the real intensity of globalisation.

[2] ESPON Study 3.4.1. « Europe in the world ». Second Interim Report. Coordinator: UMS RIATE.
[3] Morocco has proved an exception to this trend with increasing levels of FDI. Government factors are clearly a key factor in private investment decisions.
[4] Ibidem

The majority of the EU-25s foreign trade (excluding intra-European trade), has been with a limited number of countries: USA (first trade partner), Japan, South Korea, China and the countries of South-East Asia, the southern and eastern Mediterranean and Eastern Europe, including Russia. European trade with other world regions (Africa, Latin America, rest of Asia) continues to be rather weak, except with the countries of the Persian Gulf because of their oil exports and their imports of luxury or technological products. The countries for which trade with Europe is important and those which are important for Europe's trade are not the same, except for the nearest regions to Europe (southern and eastern Mediterranean and Eastern Europe).

Share (%) of intra-regional trade in total trade of each grouping



Opening rate of the trade of European countries with non ESPON countries, 1996-2000

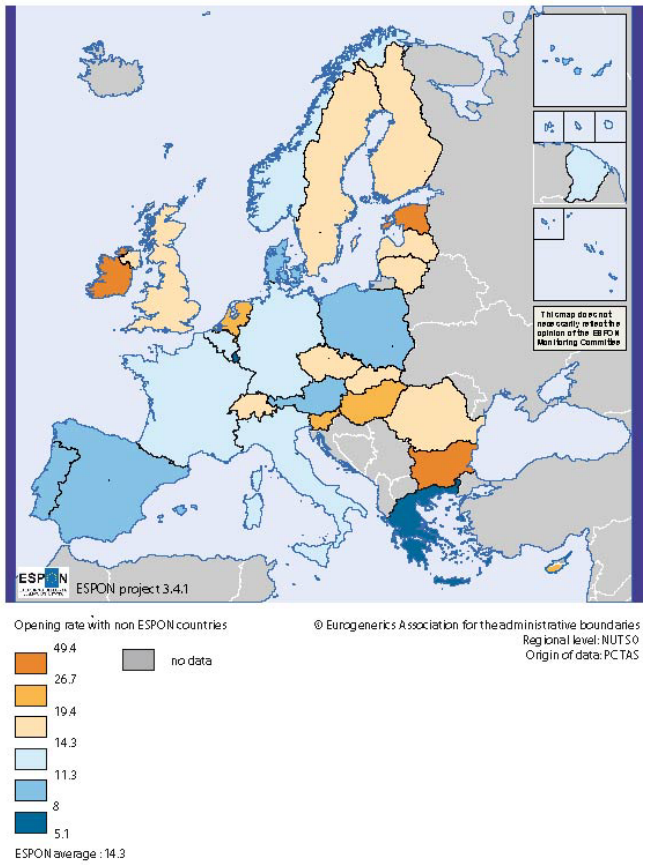


Figure 4 Intra-regional trade in world economic blocks and external trade openness of European countries

Considering foreign trade specialisation, Western Europe and North America have a strong position not only in the exports of technological industrial products (chemicals, machinery etc.), but also in agricultural exports (they represent together one half of world exports). The hegemony of Western Europe and North America is much higher in the trade of goods than in the trade of services. Between 1992 and 2002, the share of Western Europe in the world trade of services (excluding intra-European trade) has fallen back (from 32.4% to 29.5%), as has Japan's (from 10.1% to 7.6%), while the share of North America has increased (from 22.6% to 24.7%).

With regard to European trade with Asia and North America, a positive balance can be observed in chemical products and machinery, as well as in semi-manufactured products, yet Europe has developed a significant trade deficit in office and telecom equipments, as well as textile and clothing, in the case of trade with Asia. European trade with other world regions (Latin America, Middle East, Africa) show a pattern in accordance with the centre-periphery model based on exports of manufactured goods by the former, and exports of raw products or of low technology manufacturing products by the latter. Central and Eastern Europe's foreign trade shows a positive balance in mining products and, increasingly, in low-technology (clothing) and medium-technology (automotive industries) products, thanks largely to foreign investment.

As measured by trade flows, European integration seems stronger than intercontinental globalisation. For the countries of the EU-25, the share of intra-European trade (in relation to total foreign trade) has grown from 52% by 1960 to 66% by 1990 and has remained stable at this level during the last decade. Most of the small European countries (including Norway and Switzerland) have a very Europe-oriented trade pattern whereas the largest countries (Germany, UK, France and to a lesser extent Italy and Spain) show clear extra-European trade patterns. Growing intra-European integration can also be demonstrated in the case of Central and East European countries. The increasing orientation of their foreign trade pattern towards Western Europe has clearly preceded their recent political integration within the EU-25. There are however signs of different evolutions, either in the direction of globalisation at the intercontinental scale or of more regional integration with EU or non-EU countries. For instance, in the UK, foreign trade which was traditionally less European in nature, has over the last decade shown a further decline with respect to the relative (export) market shares, a trend probably linked to the growing internationalisation of the UK's economy and to the specific role of the London metropolis (globalisation). In the case of Greece, after a phase of growing European economic integration, the foreign trade pattern has revealed a more recent trend towards strengthening links with neighbouring non-EU countries (regional integration).

Factors of accelerating globalisation

The most sensitive aspect of globalisation is the emergence of new large economies at world scale, in particular in Asia. The European economy is affected in various ways by this dominating trend. First, it has to cope with increasing imports of a variety of low-cost products in the low and medium technology sectors. Second, foreign investments, including European ones, are more and more directed towards these emerging economies, mainly in the manufacturing but also in the service sectors. A direct impact is the increasing number of relocations of European enterprises into these emerging countries, in particular into China. The third impact is the need for the European economies to further specialise in advanced economic activities (R&D, new technologies and innovation, advanced services). Intensifed external competition is also expected in the future in the high-tech sector. The accelerating globalisation process has important territorial impacts in Europe.

Globalisation has other facets too, such as the growing disparity in the accumulation of corporate financial resources between enterprises in emerging economies (especially those producing energy resources and raw materials) and Europe. Through mergers and acquisitions, European ownership of enterprises can be transferred to other continents, with the risk of simultaneous transfer, not only of profits, but also of numerous qualified jobs in management, R&D, design and marketing functions. The fragmentation of the European economy, with too few "world majors" adds to this risk. The World Trade Organisation has continued to face problems in removing trade barriers, but succeeded to a significant extent with regard to manufacturing products, further liberalisation is broadly expected in the coming years *vis-a-vis* agricultural products and services.

The neo-liberal approaches to economic regulation adopted in the western world since the beginning of the 1990s, play also a significant part in the globalisation process[5]. Larger proportions of companies' added value are being distributed in form of dividends and pressure is being exerted to increase the return on investment and thus the profit rate. Long-term investments are no longer favoured, as stakeholders demand high profit rates in short periods. This is what explains the structural weakness of investments, of wage increase and of resulting growth in Europe, accompanied by high level structural unemployment. As productivity is not significantly rising, companies have to compete on costs, thus relocating enterprises into low-wages countries which are also those where the largest emerging markets are developing. Hence the cost of one working hour in the manufacturing industry has reached 24$ in Germany (a world record), 21$ in the USA, 19$ in Japan and about 17$ in France, yet amounting to only 5$ in Poland or the Czech Republic and 0.6$ in China, thus approximately 30 times less than in France and 40 times less than in Germany. Transfer and relocation of activities from Western Europe (and also increasingly from Central and Eastern Europe) towards emerging economies do not affect only manufacturing activities, but also activities which could not even have been considered some 10 years ago, notably in the service sector: computer programming, telephone marketing, law and tax consultancy, accounting, financial information analysis etc. Factors likely to generate countertrends are not easy to identify. The transition period necessary to see a tendency to wage increase in China and India may be quite long, since it will essentially depend on the exhaustion of the rural exodus which is far from over (more than half of the population of these countries still live in rural areas). Emerging economies will also reduce their productivity gap and will therefore be able to sustain their comparative advantages for a long time.

Globalisation has much to do with economies of scale, growing markets and the availability of human resources. If Europe wishes to play a major part in the globalisation process to protect and strengthen its own global role internationally, it should pay particular attention to its "neighbourhood policy", in order to increase its "economies of scale" in the globalisation process. The human capital of the EU's 'neighbourhood' (Ukraine, Turkey, Maghreb, a number of Middle East countries) is significant in quantitative terms. Should Europe be able to access and integrate in one way or another, its neighbouring 'human capital stocks', it would not only contribute to large-scale stabilisation of the region, but also to the building of a powerful economic block at the world scale. In this respect, Europe would have a stronger weight in shaping the process of globalisation.

Territorial impacts of accelerating globalisation

While the average level of openness to the world at the European scale is rather modest, the impacts of globalisation are much greater at the scale of individual regions[6]. A number of regions have taken advantage of the globalisation process to strengthen their position. These are especially the first level (London, Paris) and second-level metropolitan areas, also including those of the New Member countries (Warsaw, Prague, Budapest). Other central regions may benefit from globalisation processes, provided they have good environmental conditions: economies strongly supported by research and development, medium-sized cities with strong cultural, scientific or tourist potential. Some peripheral or semi-peripheral regions may also benefit from the globalisation process: if they have significant technology centres and parks; if they are specific 'relays' for the development of technological industries (like Ireland between the USA and the UK); if they are tourist regions able to develop qualitative products competing with low-cost destinations outside Europe or are

[5] ESPON Study 3.4.2. "Territorial impacts of EU economic policies and location of economic activities". Second Interim Report. Coordination IGEAT Brussels.
[6] ESPON Study 3.4.1, " Europe in the world", Draft Final Report. Coordinator: UMS RIATE.

western regions of the New Member countries of Central and Eastern Europe hosting relocated industrial plants.

By contrast, a number of other regions have been and continue to be negatively affected by the globalisation process. In more central parts of Western Europe, this has been the case for a long time for regions with heavy industries (steel production, coal mining) which had first to compete with the "maritimisation" process (the transfer of heavy industries towards coastal areas) and, more recently, with extra-European production. A similar evolution has affected regions with textile and clothing industries and this process is even accelerating as a result of liberalisation measures. Negative impacts of globalisation can also be observed in various "Fordist" regions, for instance those where automotive or electrotechnical industries were developed during the 1960s and which have now to compete against the regions of Central and Eastern Europe, or against Asian countries. Globalisation also endangers the "Marshallian" districts based on small and medium-sized enterprises (SMEs) with low R&D inputs which are increasingly facing the competition of low-wage countries. A number of more peripheral regions, both in the EU-15 and in the New Member countries, are likely to be negatively affected by globalisation too, in particular those with low-cost, low-technology manufacturing activities (like northern Portugal) and some tourist regions affected by the competition of new destinations in the world. Liberalisation measures in the field of international agricultural trade will affect a number of rural regions, some positively (those which are competitive enough to export outside Europe), but most negatively because of increasing imports of low-cost agricultural products.

2.2 Europe's innovation capabilities and breakthrough of new technologies

2.2.1 Innovation gaps and disparities in Europe

With the Lisbon/Gothenburg Agenda, innovation has been put high in the list of European priorities. There is however evidence for wide differences among European countries and for an increasing gap between Europe on the one hand and USA and Japan on the other. Based on their SII score[7] (Summary Innovation Index) and the growth rate of the SII, European countries can be divided in four groups:

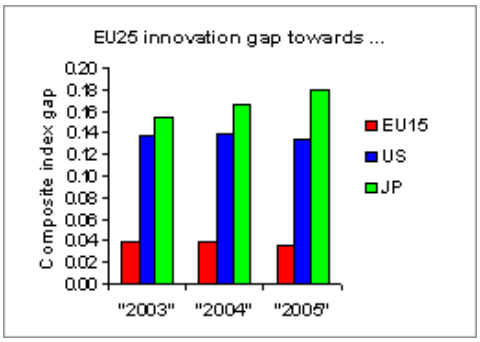
- Switzerland, Finland, Sweden, Denmark and Germany make up the group of "*leading countries"* .
- France, Luxembourg, Ireland, United Kingdom, Netherlands, Belgium, Austria, Norway, Italy and Iceland all belong to the group of countries showing "*average performance"* .
- Countries "*catching up"* are Slovenia, Hungary, Portugal, Czech Republic, Lithuania, Latvia, Greece, Cyprus and Malta.
- Countries "*losing ground"* are Estonia, Spain, Bulgaria, Poland, Slovakia, Romania and Turkey .

The US and Japan are still far ahead of the EU25. The innovation gap between the EU25 and the US is close to stable. About 70% of the innovation gap is, in statistical terms, explained by lagging EU performance in three indicators: USPTO patents, population with tertiary education and ICT expenditures. A significant increase in the EU gap for public R&D

[7] EIS 2005. The EIS (*European Innovation Scoreboard)* is the instrument developed by the European Commission, under the Lisbon Strategy, to evaluate and compare the innovation performance of the Member States. The EIS 2005 includes innovation indicators and trend analyses for all 25 EU Member States, as well as for Bulgaria, Romania, Turkey, Iceland, Norway, Switzerland, the US and Japan.

expenditures and exports of high-tech products, and an increase in the EU lead for university R&D expenditures financed by the business sector and community trademarks, can be observed.

None of the 'catching up countries' in Europe are expected to reach the EU25 average by 2010. At best, Hungary and Slovenia may attain the EU25 average under current conditions by 2015. Under this scenario, for Malta , Slovakia and Poland the catching up process would take more than 50 years. This enormous time lag should raise questions as to which dimensions of the innovation policy should be focused on in these countries. Similar questions need to be addressed in countries like France or the United Kingdom: they still show an average value of the summary index above the EU average, but might well regress to the EU average within the next 5 to 10 years. Based on the current trends, it would also take more than 50 years for the EU25 to reach the US level of innovation performance.



Source: EIS 2005

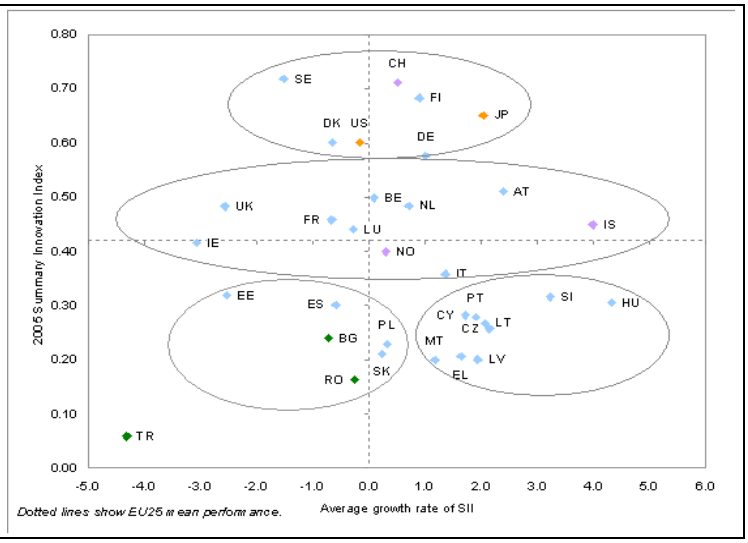


Figure 5 Innovation gap of the EU to the USA and Japan and innovation performance of European countries

There is little evidence at the country level though that innovative performance drives economic performance. This may explain why some of the European innovation leaders, such as Sweden and Finland have not yet been sufficiently successful in transforming their innovation excellence into higher GDP per capita. Conversely, at sectoral level, such positive evidence does exist. More innovative sectors tend to have higher growth rates of labour productivity as measured by turnover per employed persons. One factor that can assist in the development of a strong and innovative economy is the strength of supporting innovation infrastructure[8]. At a European level the strength of the local university base and the presence of recognised science parks and Business Innovation Centres can play a role. The promotion of innovation is however characterised by very strong territorial imbalances throughout Europe. This concentration varies in intensity according to the indicators considered. Strong territorial concentration at EU level is observed in the fields of R&D intensity, employment in high technology services and R&D infrastructure. Concentration in the northern half of Europe is observed in the fields of R&D personnel and population with tertiary education. In the case of employment in high and medium/high technology manufacturing, the contrast is pronounced between the manufacturing heartlands of Europe and the rural periphery. A number of new member countries perform well, but important differences exist between countries, in particular in the field of R&D intensity and employment in high technology services. Important imbalances also exist between regions at the national level in most countries.

[8] ESPON in Progress. Preliminary Results by autumn 2003.

2.2.2 Europe on the move towards the knowledge society

The growing importance of knowledge for economic development is accelerating the structural change of the economy in the EU (and elsewhere). New, knowledge-based sectors, e.g. bio-, nano-, material- and ICT, can potentially influence the economic growth significantly and increase productivity, whereas the "old" branches are undergoing either a deep restructuring or a decline in the course of globalisation pressure.

The European Competitiveness Report 2003 highlighted the fact that ICT capital contributed more to the growth of labour productivity in the USA than it did in Europe. Furthermore, the productivity impact of ICT grew faster in the US than in Europe in the second half of the 1990s. The Commission, in its 2004 'Review on the EU Economy', emphasizes what it sees as the main reasons why the EU is lagging behind in terms of ICT. First, a strong focus of the European economy is on industries with a technological level from low to medium. Second, in contrast to the US economy, the ICT production sector in Europe is of relatively small importance. Third, the benefits from ICT use have fallen back behind those, gained in the US economy. As far as the *use of ICT* is concerned, several studies emphasize the capability to interlink the use of ICT with complementary organizational changes in the business sector. Empirical data which stem from the so-called e-business watch, carried out by the European Commission, shows that industries with higher qualified workers and with a higher intensity of information technology use e-business applications more frequently than other industries. However, the adoption of e-business solutions is still low in SMEs and a particularly small amount of e-business activity is found in low-skill industries. Regional disparities in information society performance are also significant:

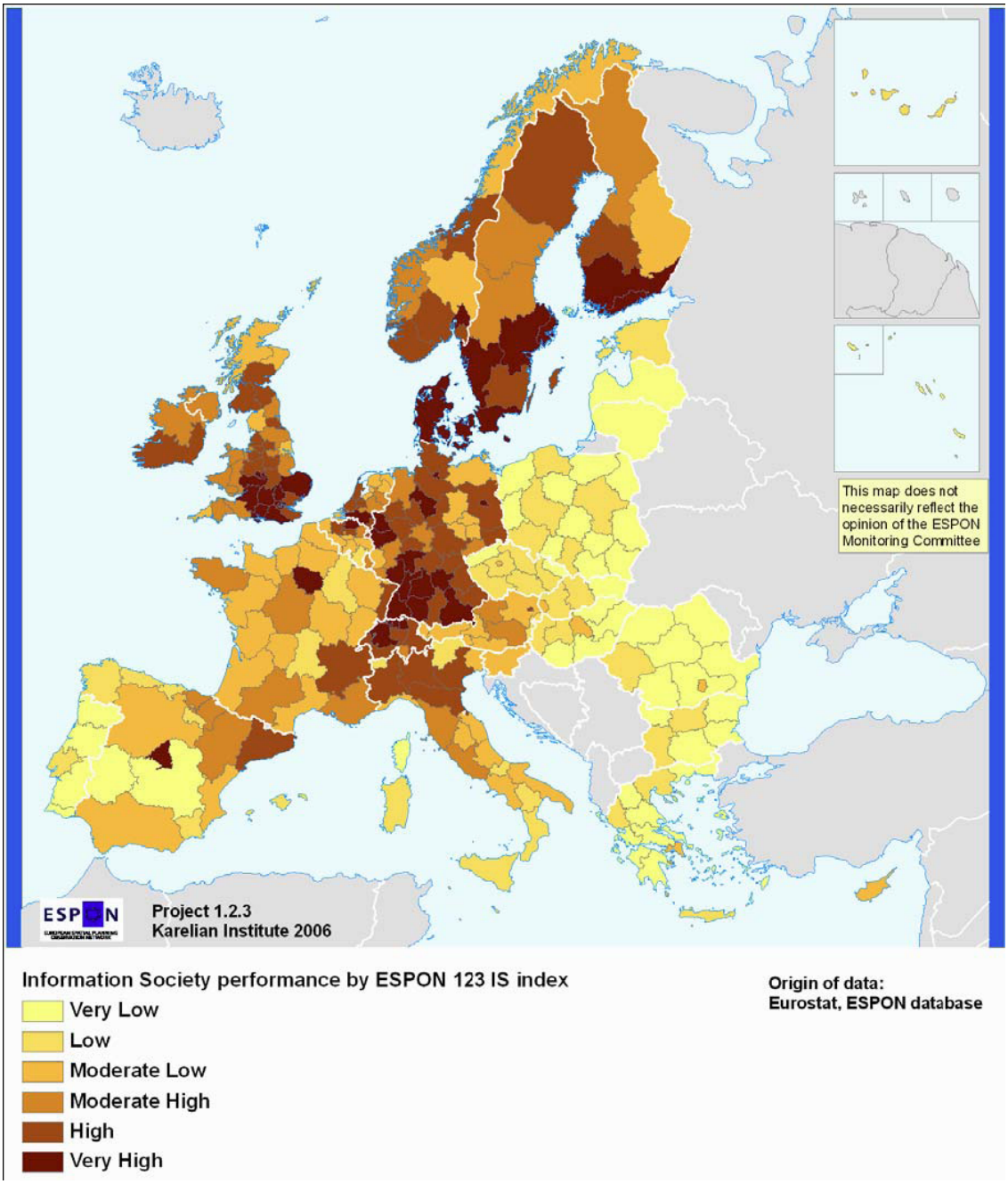


Figure 6 Information society performance – ESPON 1.2.3 IS Index[9]

Against the background of the necessary catching-up process with reference to the use of ICT for achieving a greater productivity growth in the EU, a need for policy actions arose. The Lisbon Strategy set "a challenging programme for building knowledge infrastructures, enhancing innovation and economic reform, and modernising social welfare and education systems"[10]. The Lisbon Strategy was refurbished in early 2005 after its mid-term assessment had shown that its main objective was only weakly achieved.

[9] Source ESPON Study 1.2.3. Identification of Spatially Relevant Aspects of the Information Society. Draft Final Report.
[10] Presidency Conclusions 2000, p. 1

2.2.3 Breakthrough of new key technologies

The evolution of the European territory will be substantially influenced, in coming decades, by the spread of a number of technologies which have been recently emerging. These are mainly:

- *Biotechnologies*

Biotechnologies in Food and Non-Food Production are expected to fundamentally change agricultural livestock breeding and the production of plants. Recent studies estimate market potentials of the first plant generation until 2015 to be around 30 billion US$ worldwide, while potentials for further plant generations are already expected to be of more than 100 billion US$ worldwide. Red biotechnology in R&D focuses on the development and production of new drugs and vaccines, for better diagnostic tools and individual medical care. The red field owns a high share within the whole biotechnology field concerning the number of firms. Products are expected to have high medical benefits for consumers. Experts estimate a growth rate of 10% p.a. until 2010. Although there has been research in this field since more than 20 years, lots of possible innovations are still to detect and to develop. The application areas of grey biotechnologies refer to industrial production processes and environmental engineering. Such processes may reduce the development and use of fossil fuel and raw materials in order to generate sustainable industrial production. The result is that energy can be saved, less harmful substances can be used and waste can be reduced.

- *Nanotechnologies (in production processes)*

Developments and applications in this field offer the chance for successful product development with a reduction of weight, volume, and use of raw material and energy but also in relation to production time. The spatial impacts of the application of such technologies are hardly predictable. However, it is a very R&D intensive field and as such probably more prone to localising where external agglomeration economies exist.

- *Emerging technologies in the energy sector*

The energy sector is subject to a wide range of technological evolutions which will have considerable impacts in the coming decades, both in the field of the modernisation of "conventional" energy systems and in that of the development of emerging technologies. Numerous technological evolutions will take place in the field of renewable energy sources and their exploitation. Main emerging technologies in the energy sector are: the production of bio-fuels and biomass, wave and tide hydro-power systems, hydrogen technologies, decarbonisation of fossil fuels, clean coal technologies, gas to liquids technologies, nuclear fission developments (Fast Neutron Reactors FNR, Accelerator Driven Systems ADS) and thermo-nuclear fusion (long term).

- *Innovations and new technologies in the transport sector*

The transport sector is and will be subject to a series of technological innovations. New technologies are emerging, such as magnetic levitation, which should find concrete applications in the decades to come. There are motor car transport benefits from various technological innovations. Some are related to engines and their fuelling (energy saving engines, bio-fuels, hydrogen fuel cells, electric engines etc.), others to the reduction of air pollution, to the increase of security, to navigation systems etc. A major element of innovation in cars and trucks is to be found in electronic systems and applications. The aircraft sector benefits from innovations in the propulsion systems (energy savings, lower

noise level), in security systems, in materials etc; airplanes with very large transport capacity are entering the market. Innovations in electronic systems and applications also play a considerable part in airborne transport. In the maritime transport sector, technological innovations concern new types of ships (catamarans, high-speed ships, self-loading ships etc.), security systems (for instance double-hull tankers) and propulsion systems (gas turbines etc.). Intelligent transport systems will be further developed.

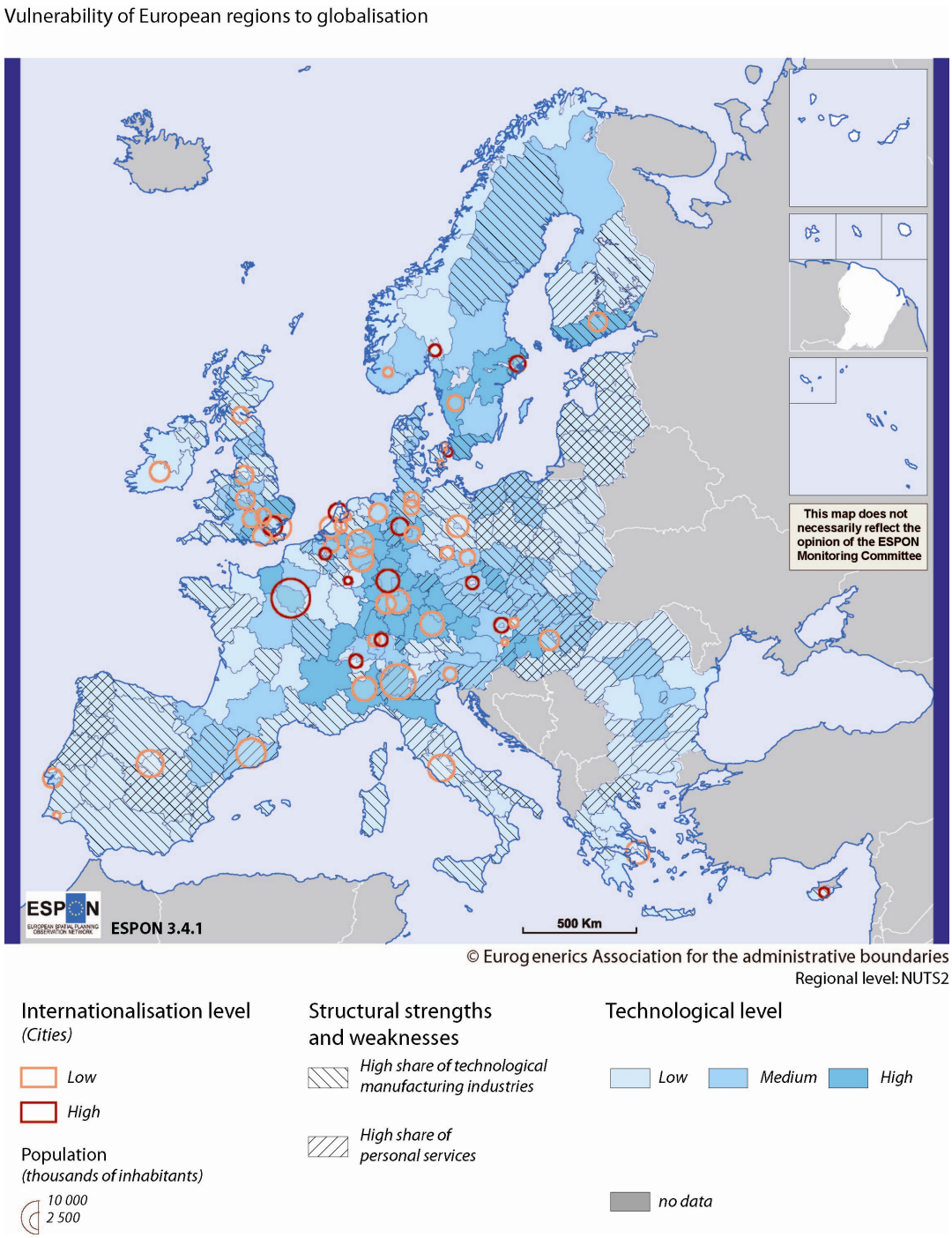


Figure 7 Vulnerability of European regions to globalisation[11]

[11] Source: ESPON Project 3.4.1. Europe in the World. Draft Final report

2.3 Europe on the way towards a new energy paradigm

2.3.1 EU's growing external energy dependence and related strategic issues

The EU is relatively poor in conventional energy reserves. The EU imports around 80% of its oil. With the foreseeable depletion of North Sea oil reserves and still growing demand, external dependence would rise, under baseline hypotheses, up to 90% by 2020. Main suppliers are presently OPEC countries. Gas import dependence of the EU is presently 40%. It is expected to rise to 66% by 2020. Main suppliers to the EU are Norway and Russia. Although new suppliers are entering the market (North Africa, Middle East, Central Asia etc.), dependence on Russia is increasing considerably as a result of EU enlargement. As far as coal is concerned, the enlarged EU still has substantial reserves (the UK, Germany, Spain, Central and Eastern Europe), but imported coal is far cheaper than domestically produced coal (four times cheaper in the case of German coal). Production in Europe is falling and is likely to continue to do so, in particular in the new member states of Central and Eastern Europe. As a result, coal imports into the EU are increasing although demand is decreasing. Europe is poor in nuclear resources (uranium). EU demand for uranium has stabilised at about 20 000 tons per year. Future trends in demand are unclear, given the uncertain future for nuclear power in several member states. Demand for uranium in the EU will increase if demand for nuclear electricity significantly increases. This will create greater dependence on external resources (from Russia, Canada and Australia).

The increasing external dependence of Europe for its energy supply implies that strategic issues at world level are of considerable importance for the future of Europe. As far as world oil demand is concerned, it is growing rapidly under the influence of large emerging economies such as China, India and Brazil, as well as of other developed economies like the USA. This explains the sharp increase of crude oil prices since 1999 ($9/barrel in 1999; $80/b by mid 2006). Looking at the future, the evolution of the oil sector is rather serious because of the probable progressive depletion of oil resources. According to a number of experts, a geological process of oil production peaking at the world scale is likely to happen between 2010 and 2020. In the best case scenario, new resources will be discovered, but their conditions of exploitation will be much more difficult and expensive than those which prevailed up to now. This means further growing oil prices.

Gas reserves are, compared with oil, relatively well distributed around the globe. The former Soviet Union is the major source of gas reserves, with the Middle East a close second. Other major reserves are spread throughout Asia-Pacific, the Americas, Africa and Europe. Worldwide, the prospects for gas supply are relatively good in the short term, predicted to peak in perhaps 20 years or so. This will depend upon the rate of global gas consumption. In the long range (by the year 2030), however, gas production peaking at world scale will most probably have taken place and the situation will be similar to that of oil. Almost 80% of world coal reserves are concentrated in North America, Asia-Pacific and the former Soviet Union. Reserves in Europe, based on caloric value, are estimated at 72 billion tons of coal units (of which 70% is hard coal). Coal reserves are being used at a far slower rate than oil and gas. Significant expansion of nuclear energy production would be confronted with limitations and obstacles in the medium range.

2.3.2 Potentialities for renewable energy sources

The contribution of renewables to energy production across the EU is around 6%, of which hydropower represents about 2/3. Renewable energy sources are currently unevenly and insufficiently exploited in the European Union. Some countries, such as Austria, Sweden, France and Italy have a large renewables sector. Some, such as Germany, have intensive programmes or legislation in favour of renewables and some have little exploitation of renewable resources. Outside the EU, both Norway and Switzerland have significant renewable resources, mainly of hydropower. Large-scale hydropower is the largest producer of renewable energy, both the best exploited and the most mature. Within the EU, hydropower supplies cover around 14% of electricity demand. Most economically feasible sites have been exploited in Europe. Reserves still exist of small-scale hydropower (< 10 MW) for local decentralised generation. A growth of some 2500 MW is anticipated in the EU by 2010. Further potentialities exist in the offshore sector (wave and tide energy), in particular in the Atlantic area. Technologies still have to be developed.

Installed capacity for wind energy has more than doubled during the 1990s and the same happened over the past five years. There is potential for further strong growth. A quadrupling of market potential by 2020 is possible, thanks to offshore installations, greater capacity wind turbines, large dispersed wind farms etc. There is also significant potential for solar, thermal collectors which produce low temperature heat for domestic applications. Installed capacity is increasing, but paradoxically, more in the northern half than in the southern half of Europe. Photovoltaic electricity production is on a very small scale in the EU. Cost is a decisive factor. Installed capacity has not grown as quickly in the EU as in the rest of the world. It is however estimated that a significant market potential exists, as high as 2000 MW by 2010, compared with 200 MW in 1999. As far as biomass is concerned, potential is very significant and there are numerous applications. Biomass is used for the production of heat and/or electricity, for instance in CHP plants (Combined Heat and Power). Biomass will also be used more and more to produce bio-fuels for the transport sector (mainly bio-diesel and bio-ethanol) as a complement or substitute to oil products. Geothermal energy depends on similar technology to the oil industry. "Hot dry rock" technology aims at "mining" heat of 200-250°C which is available in many places in the EU at a depth of 5000m. The installed capacity of the EU has risen gradually in the 1990s and is likely to continue to do so, but the market potential by 2010 is unlikely to exceed 2700 MW. As far as heat pumps are concerned, there is significant potential for the heating of dwellings and offices. But it is necessary to take account of the real energy efficiency of such technologies (ratio between energy produced to primary energy consumed), which is less favourable than the ratio energy produced/electricity consumed.

2.3.3 Main characteristics of the new energy paradigm

A logical consequence of the increasing imbalance between energy supply and demand is the increase of energy prices. This is already obvious in the oil sector. Gas prices, which are indexed to oil prices, are progressively following the trend. Through substitution effects, other energy sources are also becoming more expensive. Europe is thus moving towards a new energy paradigm driven by the increasing prices of oil and gas and their potential depletion, the main characteristics of which are the following:

- the need to further improve the energy efficiency of consumers. The energy intensity of the European economy (share of energy consumption in total GDP) has significantly decreased since the 1970s oil shocks as a result of the adoption of energy saving measures and of energy efficient technologies, as well as from the structural changes in the European production systems (abandonment of heavy industries which are highly energy consuming and development of high-tech industries which produce higher added values with far less energy consumption). This trend is likely to continue and even be accelerated. High oil prices generate investments in energy efficient production techniques and will also speed up

the structural transformation of the European economy (towards a more technologically and service-based model). There are however significant disparities among European countries in terms of energy intensity, with most new member countries in a far less advanced situation, what is more or less shared though is a need to;

- accelerate the exploitation of renewable energy sources, in particular, solar and wind energy as well as biomass and bio-fuels;

- reconsider the issues around "conventional energy sources", such as coal or nuclear energy. Significant societal debates related to environment and security will emerge soon as to which appropriate answers have to be prepared, including those related to technological solutions (for instance coal gasification or production of nuclear waste with low radiation);

- rethink energy issues around transport and mobility functions. This is not only related to the possible evolution of modal shift, but also the potential for mobility reduction, including wider use of telecommunications and also the development of new settlement systems requiring lower mobility levels;

- consider the impacts of climate change on the energy sector. Climate conditions have important impacts on energy consumption patterns. Climate change with longer periods of high temperatures in summer time generates higher energy consumption for cooling offices and dwellings in a number of regions of Southern and even Central Europe, but less heating in the winter in the northern parts. Climate change also has impact on energy production systems. Sustained drought in Southern Europe has significant negative impacts on the production of hydro-electricity, because of lack of water in barrages. Acceleration of climate change will not be neutral in energy terms.

- strengthen at the EU level the geopolitical dimension of energy supply issues. The growing external dependence of the EU for its energy supply gives a new dimension to EU external policy. Energy supply in Europe is becoming an integral part of geopolitical relationships. In case of oil depletion and scarcity, it is likely that international tensions will emerge. Peaceful solutions will have to be looked for at the highest level.

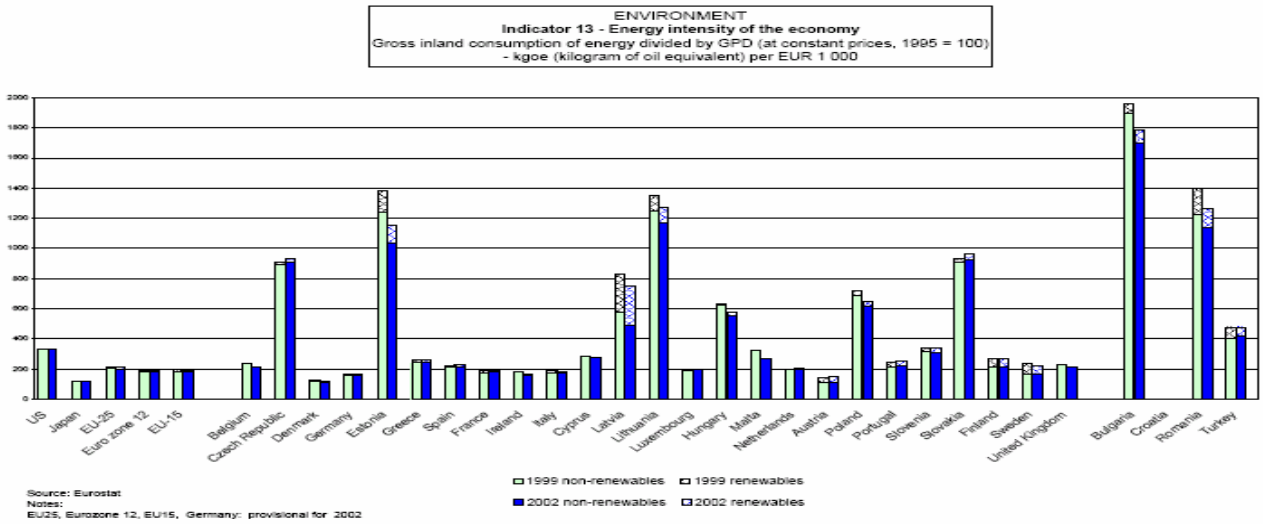


Figure 8 Energy intensity of European national economies

2.4 Changes in European society

2.4.1 Population ageing becomes a tangible reality

Europe has, over the past three decades entered its 'second demographic transition' with populations failing to replace themselves, which is itself a major driving force for change. Structurally then, there is an increasing proportion of old people which is likely to continue as the 'baby-boom' generations reach retirement age. Irrespective of how this phenomena is explained (post-industrial etc.), it is clear that the contemporary demographic behaviour of the EU is different to what it was 30 years ago. Compared with major global population trends at world scale, Europe is famously out of line with its natural population evolution declining, or at zero in the majority of European states. But as with other parts of the world, it is experiencing high levels of immigration. In nation state terms, the countries with the highest levels of population ageing are Italy (share of population over 65 in total population: 18.0%), Greece and Sweden (17.3%), Belgium and Spain (16.8%), Portugal (16.4%), Germany and Bulgaria (16.2 %) and France (16.0%), while those with youngest populations are Cyprus (11.6%), Slovakia (11.4%) and Ireland (11.2%). At territorial scale, European demographic developments are characterised by extremes; parts are very congested, others experiencing severe depopulation. On the whole the natural population movements are negative, but this is not generally the case in areas of high density. In such regions, on the whole large agglomerations, a combination of a high proportion of young people and immigrants have produced populations out-growing available jobs and services and out of synchronisation with the demographic situation across the rest of Europe.

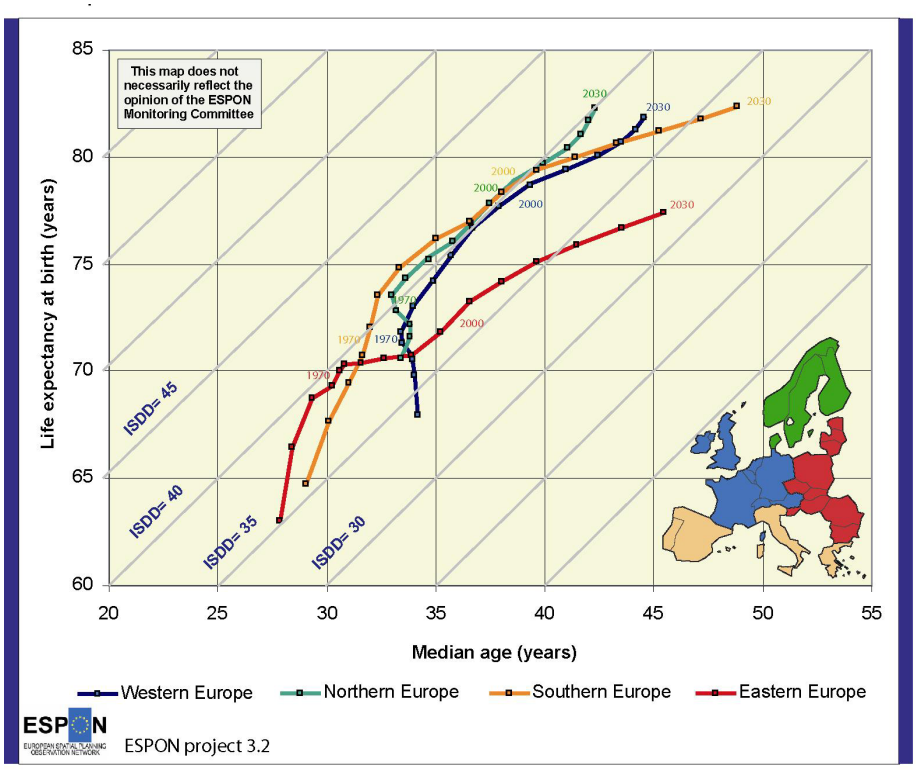


Figure 9 Life expectancy, median age and index of sustainable demographic development

If the former trend continues on its present path the labour force will inevitably shrink as there will be insufficient entrants to replace those leaving, although a decrease in unemployment will compensate for this, partially at least. This would make economic expansion difficult to sustain and make preserving welfare levels difficult. Specifically as the number of people dependent on retirement benefits increases, the viability of this expanding element of social security systems may become fiscally unviable, though increasingly difficult to challenge as the political weight of the aged constituency grows. There are also clear indications of increasing mobility and different consumption patterns of older citizens.

To meet the challenges of an ageing society, Europe attempts to mobilise people to enter the labour market and to create policies to further promote women's employment in all age brackets but in particular in the older ages, and to fully utilise the female employment potential among immigrants. The challenge is also to close the gender pay gap and to facilitate reconciliation of work and family life for both women and men. All these measure are limited however by the fact that if job creation remains low, these new entrants will not find employment, or only displace existing job holders.

2.4.2 Immigration and integration issues are gaining in importance

A variable but growing number of immigrants in EU member countries

Immigration from outside Europe is the sole means by which many national population levels are being maintained. While most countries in Europe have been a desirable destination, some countries are considered much more so (such as the UK and France) resulting in imbalances across the EU and high rates of illegal immigration. Nonetheless all EU countries with the exception of Latvia, Lithuania and Poland currently have a positive crude net migration rate. The share of population originating from external immigration is therefore not insignificant in Europe. The composition of the immigrant population according to nationality obviously varies in each destination country, being dependent upon: the migratory tradition within the country; the nature, scope and coverage of the networks established by previously established foreign communities; the employment opportunities offered at the destination; the geographical proximity between the country of origin and the destination country and certain determining factors such as historical and cultural links with former colonies and protectorates. Hence immigration to Portugal is sourced largely by Cape Verde, Angola, Guinea and Brazil, France by North and Sub-Saharan Africa, the Netherlands by Surinam and the Former Dutch West Indies. Recent developments in Central and Eastern Europe have given rise to new migratory waves, thereby increasing the in-take of immigrants from neighbouring states. Eastern European countries host large numbers of refugees and internally displaced persons, in particular from Armenia, Bosnia and Herzegovina, Croatia, Georgia and the Russian Federation. Many of the refugees and internally displaced persons have not been able to return to their countries or homes and face an uncertain future throughout the region.

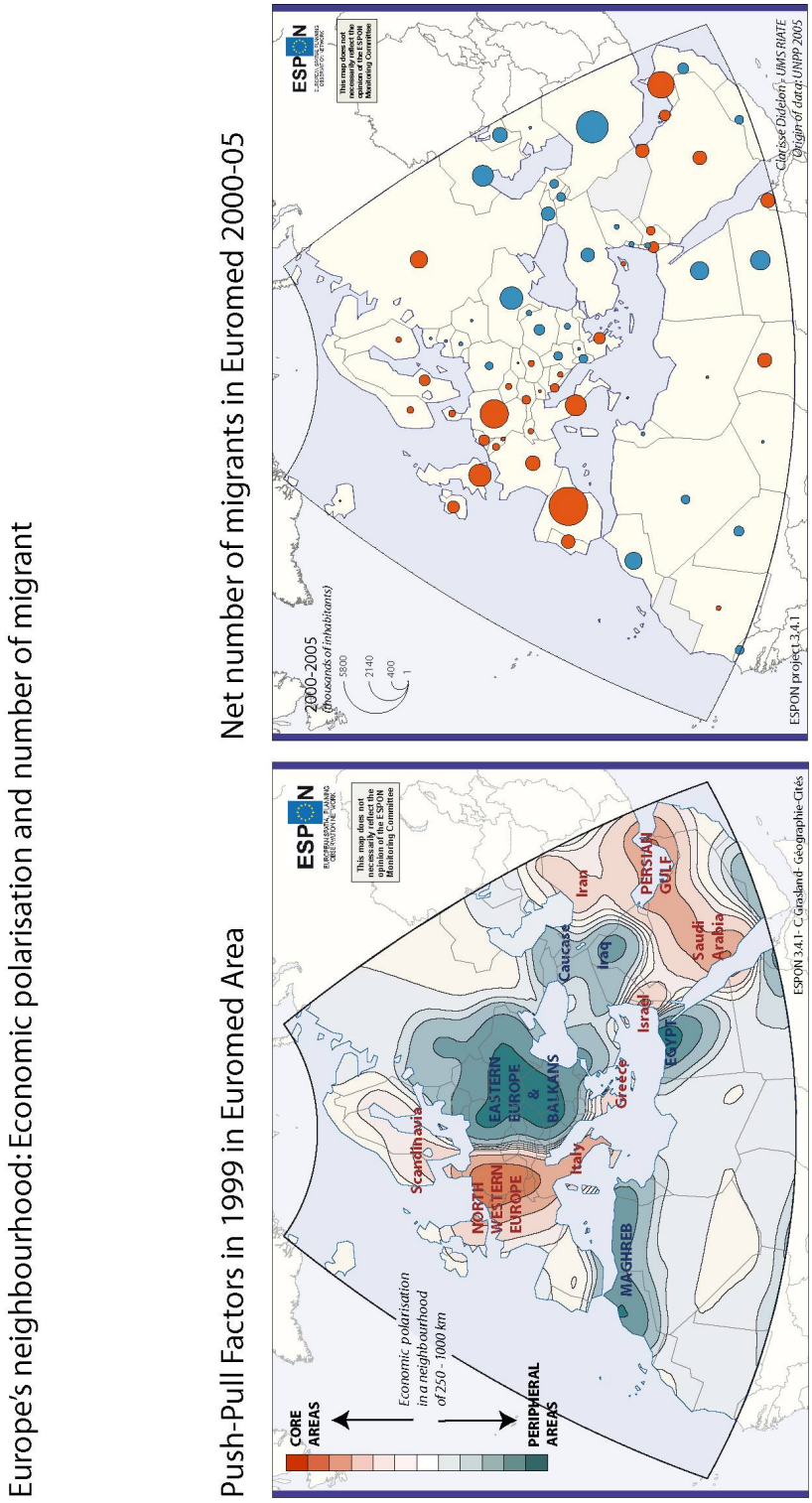


Figure 10 Europe's neighbourhood: Economic polarisation and number of migrants[12]

[12] Source: ESPON Study 3.4.1. Europe in the World. Draft Final report

Immigrants generally concentrate in large urban areas

The significant variable when it comes to the location of a high proportion of foreign population is the urban–rural one. Most cities and notably most capital cities have a much higher proportion of foreign nationals, foreign-born and second and third generation immigrants than other towns or outlying rural areas. For instance in the Netherlands, 48% of the population of Amsterdam can be defined as immigrant, approximately half of these being defined as ethnic minorities, while in the Netherlands as a whole it is 8%. Obviously, countries with a colonial past, and capital cities with a history of migration, have a significantly higher proportion of foreign residents than those with neither. Thus the highest percentage of foreign citizens is maintained in countries such as Germany, France, the Netherlands and the UK and in cities such as Luxembourg (59.15%). There are marked increases in capital cities with a more recent history of immigration, such as Madrid (12.75%), Dublin (8.4%), Rome (6.6%) and Lisbon (6.27%). In capitals with a longer tradition of migration the percentage of children of immigrants (first, second and third-generation) is high, such as in Amsterdam (20%), Luxembourg (23.7%) or Berlin (18%) and the proportion of foreign or ethnic minority communities will increase significantly over the next 25 years due to the higher fertility rates of most in-coming groups. Even in countries without links with former colonies and no strong history of immigration the pattern is clear, thus in Vienna the percentage of foreign nationals is over 16% compared to the national average of approximately 9%.

According to the Urban Audit (European Commission) European cities are becoming more international and cosmopolitan. *W*hile 84% of the cities have experienced a decline in the proportion of national citizens between 1981 and 1996, the average proportion of people of foreign citizenship - and especially non-EU nationals - increased from 4,6% to 6,6% in the same period. This is a trend characterising all European cities of today. According to the findings of this survey the attraction of cities as settings for migrants and ethnic minorities can also be explained by factors such as the extended supply of services available in the cities and access to housing. Furthermore, to a higher degree than smaller cities and towns, larger cities enable migrants and ethnic minorities to live close to family and kin, which can be an important point of departure for integration in everyday life. In that sense, cities and larger urban areas constitute a kind of safety net for migrant and ethnic minority groups.

Access to employment is of key significance for social inclusion. The employment rate of immigrants varies according to the place of origin and the level of education. Foreign born residents from other industrialised countries have a similar or higher employment rate and a lower unemployment rate than the EU average, while immigrants from other parts of the world have substantially lower employment and higher unemployment rates than the EU average. Differences in employment rates are greatest among women. There is also evidence that immigrants from non-industrialised countries are more often subject to poverty and social exclusion. Social exclusion is a very broad concept which includes not only deprivation, lack of housing facilities, but also problems of social and political relationships, such as social isolation, non participation in social protection measures and lack of citizenship rights. In practice, exclusion has a financial dimension (poverty) often rooted in a poor relation with the labour market (long-term unemployment, insecure employment or dependence on the informal (unregulated and untaxed) economy).

Multi-culturalism: from factual evidence towards a policy concept

It is obvious that Europe has progressively become, over the past decades, a multi-cultural society. The most important contributing factor has been sustained immigration from outside the EU and largely from outside Europe (North Africa, Sub-Saharan Africa, Middle

East, Asia etc.). Local socio-cultural instability is developing with the strengthening of ethnic communities on the one hand, and the defensive reactions of the endogenous population on the other. Insufficient socio-cultural integration is a growing challenge, added to that of economic integration.

As a policy concept, multi-culturalism (public policies aiming at preserving and promoting the cultural identities of the various groups composing society) has become an issue within the EU, with the growing emancipation of previously marginalised national and ethnic minorities and immigrant communities. The main instrument for preserving the cultural identity of the newly arriving immigrant communities traditionally was education, formal and informal. However the role of education has come under the spotlight in recent years with evidence that segregated schooling has contributed to the polarisation of different communities. The debate around whether assimilation is a preferable objective to maintaining separate ethnic and religious identities has consequently become more intense with much of the focus on education and its potential as an effective tool of integration. The role of the mass media in cultivating and reinforcing identities and affiliations has also become critical once more.

Territorial footprints of changing life styles

During the decades of high economic growth in the post-war period, the western world experienced mass consumerism as the dominating lifestyle. This period has been highly detrimental to the environment. During the 1980s and 1990s, lifestyles have changed under the pressures of economic constraints and growing unemployment. Environmental consciousness started developing. At the same time, a number of factors (growing immigration and related cultural differences, people ageing etc.) led to strong differentiation of lifestyles in Europe leading to a more individualist form of consumerism, while others of more global character (technological developments in the field of media ICT etc.) caused stronger homogenisation of certain aspects of lifestyles. The growth in information intensification is also providing society with new means for both information collection and communication. More and more people in Europe, although not yet the majority of them, are coming to the awareness that an ever-improving standard of living can no longer be expected. They design their lifestyle without the expectation of continuing income growth and therefore pursue security and adopt a more passive, but rational attitude towards consumption.

In the countries of Eastern and Central Europe, the situation is quite different as regards the history of consumption patterns. These countries were not affected by the consumerist wave which flooded Europe from the 1960s to the end of the 1980s. On the contrary, consumption was severely constrained by the former regimes. Since the beginning of the 1990s, consumption patterns have attempted to catch up, but are still limited by purchasing power. Simultaneously, these countries are also subject to the new consumption trends and changes which are taking place at global scale, so that an overlapping of contradictory trends can be observed there.

Demographic changes have important impacts on lifestyles. There are for instance clear indications of increasing mobility and different consumption patterns in older population groups. Growing ethnic heterogeneity, associated with specific socio-economic characteristics also has a strong footprint on lifestyles. Under the influence of economic globalisation, international experience is becoming an increasingly common phenomenon in the life of the average person, affecting lifestyles, consumption patterns and basic values.

Mobility is undergoing important structural changes which has significant impacts on lifestyles. In general terms, people's mobility has been steadily increasing and diversifying as far as purposes are concerned. As far as work-related mobility is concerned, a number of

contradictory trends exist. The globalisation of production and trade systems increases the long-distance mobility of professionals. At local level, commuter flows are also growing in distance and in volume as a result of progressing suburbanisation. Increasingly, consumption and entertainment-oriented lifestyles are important factors, driving the increase in non-work-related trips. On the other hand, the development of ICT is also important in terms of mobility. While in many respects telecommunication can be substituted for physical mobility, the increasing flows of information accessible through the Internet generate needs for higher mobility. Tele-working and home-working will certainly continue to spread in the world of work, whereas in some sectors tele-working will be more and more substituted by home-working with employees turning into self-employed contractors.

The lifestyles of Europeans with regard to leisure activities have undergone some substantial changes over the past few decades. More frequent 'long week-end' travel has become more popular, while shorter holiday periods have become a general rule. The decreasing price of air fares encourages long-distance leisure mobility. Increases in disposable income, at least for a part of the population, and related consumer expenditure have brought about steady growth in leisure markets. New forms of consumerism are however more orientated towards the consumption of services and less towards the consumption of goods, as compared with the 1960s-1980s period. Changes in leisure lifestyles have in this respect been supported by the development of concepts such as branded restaurants, multiplex cinemas and fitness centres that have relied less upon technical progress and more on innovation and organisational and marketing expertise. The feminisation of leisure results from an increase in women's disposable income and implies a consequent opening up of new markets for female special interest activities (e.g. health and fitness).

In the opposite direction, a crisis has progressively developed in Europe during the past two decades with an corroding impact on 'social trust'. Social institutions and public organisations are facing a sharp loss in public confidence. In addition to the crisis of the welfare state, there are growing uncertainties and fears, such as higher unemployment rates and the perception of worsening public safety. The perception of equality has been eroded and advancing hierarchies, based on and strengthening the social divide, are undermining traditional occupational openness. All these changes, added to issues of security in cities, point in the direction of developing more self-protective attitudes.

2.5 Main transport challenges for the wider Europe: containing the growth of traffic congestion and improving accessibility

Increasing traffic congestion in central regions and new member countries versus isolation of more peripheral regions

The past decade saw not only a worrying increase in traffic congestion in urban areas, but also a new phenomenon of congestion of the major arteries of the trans-European network, increasing the number of bottlenecks. Missing links in the infrastructure, and a lack of inter-operability within specific transport modes and for intermodal transport systems, are all reasons aggravating this congestion of the network. All transport modes are affected: road transport, but also railway transport – the railways themselves estimate that, on the basis of existing technologies, 20% of the railway track is bottlenecked. In the new member countries, growing motorisation generates congestion on low-capacity, obsolete road networks. Also air traffic is increasingly affected by delays. In contrast, the peripheral regions still suffer from isolation due to a lack of connections with the centre of the continent, and also congestion on the central parts of the network. The peripheral countries

of the European Union are thus directly affected by the deterioration of traffic conditions in transit countries. EU-enlargement and increasing integration accelerates this traffic growth, in particular for freight. At the same time, the provision of infrastructure does not keep pace because, amongst other things, of a lack of public financing and the current difficulty of mobilising private funds.

European transport suffers from an imbalance between transport modes, to the detriment of railways, more particularly in the rail freight transport, of maritime shipping and of inland waterways. While this reflects the fact that some modes have adapted better to the needs of a modern economy, it is also a sign that not all external costs have been included in the price of transport and certain social and safety regulations have not been respected, notably in road transport. In the present transport programmes of a number of member countries, motorways are consistently prioritised over other types of linkages, raising the spectre of Europe being unable to keep to its Kyoto deadlines on CO2 emissions etc. The trend towards wider car ownership continues apace and EU statistics as a whole for this factor will show a marked increase in the coming years as the new Eastern European members see a significant rise in personal car ownership. Though oil price increases may have an impact here it is likely that prices will have to rise to a truly phenomenal level to significantly impact this situation as the desire for the 'freedom' that car ownership potentially brings is basically inelastic in economic terms.

Accessibility

Accessibility can be measured in a variety of ways. Potential accessibility is based on the assumption that the attraction of a destination increases with size, and declines with distance, travel time or cost. The most accessible regions by road to the population (accessibility index higher than 120% of ESPON space average) are basically those of the pentagon, with an extension eastwards to include East-Germany[13]. The least accessible regions (accessibility index below 40% of the ESPON space average) are all located in the European periphery (Nordic countries, north of Scotland, Ireland, Portugal, western and southern parts of Spain, Corsica, Sardinia, Greece, Cyprus, Malta, eastern parts of Romania, Baltic states). In terms of potential accessibility by rail, the most accessible regions (accessibility index above 120% of the ESPON space average) are largely contained in the pentagon, with some extensions towards East-Germany as well as towards the Rhone valley and the Loire valley in France. Areas with low accessibility by rail in the European periphery (accessibility index below 40% of ESPON space average) are more extended in the case of Spain, Bulgaria and Romania. Potential accessibility by air provides a completely different picture, compared with those on land transport accessibility. The map of Europe is converted into a patchwork of regions with high accessibility surrounded by regions with low accessibility.

Various factors affect the evolution of accessibility, both positively (TENs, HST etc.) and negatively (congestion, impacts of hazards on infrastructure etc.). A particularly important factor in this respect is the emergence of low cost air companies. This does not only increase general air traffic which becomes competitive even against railway transport on relatively short distances, but it also boosts the development of regional airports, including the related noise and air pollution. The map of air traffic flows in Europe has considerably changed in a few years due to low cost companies. In many respects, this has been beneficial to the accessibility of more peripheral or land-locked regions. The increase of oil prices may however limit in future the competitiveness of low-cost air transport.

[13] ESPON Study 1.2.1. « Transport services and networks : territorial trends and basic supply of infrastructure for territorial cohesion ». Lead Partner: University of Tours (France)

2.6 New territorial challenges for environmental sustainability and impacts of climate change

The environmental situation in Europe has generally improved over past decades thanks to more constraining regulations and to changes in the economic structure of the European economy. Nevertheless, a number of environmental challenges persist which have a particularly significant territorial dimension. These are mainly:

Water stress and quality

Water stress concerns the excessive withdrawal of water relative to available water resources. In general, water stress in Europe has decreased in the 1990-2005 period. Agricultural water consumption has been rising however, though slightly, particularly in southern regions. Household consumption is stable in the west, but rising in the east due to increasing welfare. Manufacturing water consumption remains stable. With regard to water quality, the issue of point sources has been addressed following the 1991 EU urban waste water treatment directive. 50% of all environmental budgets went to water pollution control. Improving sewage systems and reducing pollutants at source (e.g. phosphate in detergents) have had good results, particularly in Western Europe, where rivers became less polluted. The EU-10 are catching up, although major investments in sewage systems are still needed. The main source of diffuse pollution is agriculture, particularly nitrate as a result of fertilizers and manure. Ground water is expected to become more polluted in the coming decades, since nitrate is reaching groundwater very slowly. While rivers are recovering from severe pollution as a result of a sharp reduction of point source pollution, diffuse pollution will continue for decades, and will pose a threat to the quality of drinking water in all agricultural areas.

Air pollution and greenhouse gas emission

Emissions causing ozone generation have been reduced by a third since 1990. Ozone concentrations are highest during warm smog periods. Fine particulate emission is declining (40% in EU-15 since 1990), but up to 55 % of the urban population is still currently exposed to fine particulate concentrations above the air quality limit set by the EU. However, uncertainty exists as to whether this decline will be reflected in air concentration, since other factors play a role (such as weather conditions). The greatest damage is evident in the Benelux countries, northern Italy and in parts of Poland and Hungary. Sulphur dioxide emission has declined by two-thirds since 1980. Sulphur dioxide has caused serious acidification of ecosystems (lakes, forests), particularly in Northern Europe. Ecosystems are recovering now, but this recovery is slowed down by other acidifying gases like nitrogen oxides. Nitrogen oxide emissions have also been reduced by a quarter from the 1990 levels. However, reductions are not the only issue, returning all ecosystems back to a healthy status entails reducing acid deposition below their critical loads. The implementation of the Kyoto Agreement is contributing to the reduction of greenhouse gas emissions.

Natural areas and conservation policies

European nature is suffering from a loss of biodiversity, fragmentation, and an erosion of the total area of natural value. Most vulnerable are wetlands, low-intensity farming systems, semi-natural grasslands, and mountain areas. The most important driving forces behind changes (mostly negative) in natural areas are the following: urban sprawl and new infrastructure causing decrease and fragmentation of natural areas; intensification of agriculture in the most productive areas polluting and eutrophicating the environment, thereby reducing biodiversity and the possibilities for migration of species between one natural area and the other; the abandonment of low intensity agricultural areas leading to

the invasion of a limited number of shrub species and consequent forest fires leading to widespread desertification; tourism and second housing in attractive areas putting sensitive ecosystems as wetlands and particularly mountainous areas under pressure. The EU policy objective is to halt the decrease of biodiversity by 2010 (Natura 2000, promotion of environmental practices in CAP, etc.).

Territorial impacts of climate change

Looking at the current evidence of climate change, some important indicators speak for themselves. The earth's climate has warmed rapidly by about 0.7 □C in the last century, with an increase of 0.95 □C in Europe. The hottest years of the 20th century which were in the1990s, show an acceleration of the process. Impacts can be categorized along two lines: the atmospheric events themselves and their indirect results. Atmospheric events, in turn, can be differentiated between long term trends (increasing average temperature) and changing frequency and/or magnitude of extreme events (storm surges, heat waves, etc.). Indirect impacts are related to these two categories. Sea level change or prolonged growing seasons result from changing average temperature. Increased flooding frequency is directly caused by more high-intensity rainfalls. Both processes taken together might exacerbate the impacts. More storm surges on a certain coastline together with a higher sea level increases the risk of coastal flooding. Climate change has accelerated during the past decade. One can reasonably assume that it has already caused important damage in European regions and current evolutions are potentially threatening territorial and environmental balance. The most damaging impacts of climate change with damaging impacts are flooding, drought and storms/hurricanes. Increasing average temperature also has important impacts with a rise of sea levels and the destruction of glaciers in mountain regions. Floods have been numerous and very damaging during the past 10/15 years. Although most of them took place in the northern half of Europe (Rhine/Meuse basin, Elbe and Oder basins, English river basins), a number of floods have also had tragic impacts in southern Europe (north-west Spain, southern France, northern Italy). Drought is particularly affecting the southern half of Europe. In recent years, it has been detrimental to agriculture with a significant reduction of harvest and yields. Cattle breeding and dairy production are suffering from the lack of fodder. Fruit production in southern regions is affected too, with a large number of trees under threat. Fish mortality in rivers is significant. Risks of forest fires have strongly increased. Storms and hurricanes had strongly damaging impacts in winter 1999, in particular in France and Germany, as well as in winter 2004/2005 in northern England/Scotland, northern Germany, Denmark and Poland. The heat wave during summer 2003 has caused an estimated 30,000 human deaths in Europe.

2.7 Urban and rural Europe

2.7.1 Evolution of urban Europe

The evolution of urban systems in Europe is conditioned by a wide variety of factors stretching from technological evolution to socio-cultural issues over accelerating globalisation. The impacts of such trends are not similar however in all countries and regions, because the national urban systems are not all at the same stage of the long-range urbanisation cycle which has crossed Europe for more than a century, starting in England and reaching progressively the continent and, later on, the European peripheries. This cycle comprises various phases from urbanisation caused by rural-urban migration, maturation, de-urbanisation and urban sprawl, re-urbanisation combined with the widening of catchment areas of large agglomerations etc. It must be added to this that the countries of Central and Eastern Europe have been subject to a specific urbanisation process during the

post-war period, related to the communist regimes and the planned economy. Urban Europe is therefore rather diversified, both in terms of morphological patterns, of evolution characteristics and of urban-rural relationships.

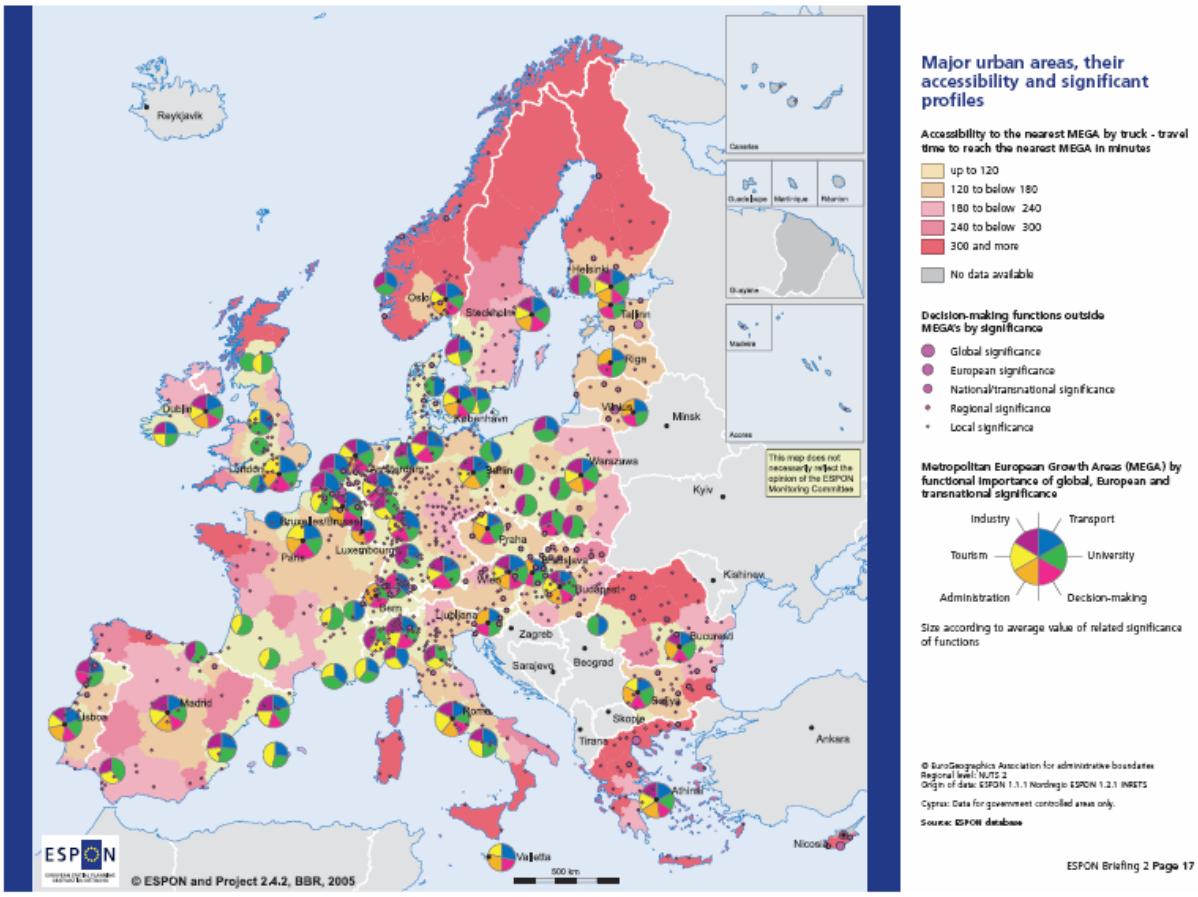


Figure 11 Major urban area, their accessibility and qualitative profiles

Global European level

Considered at this level, the EU urban system constitutes the main motor of the core-periphery divide of the European space. The "core" corresponding to the pentagon (i.e. the area cornered by London, Paris, Milan, Munich and Hamburg) includes both the European Global Nodes (Paris, London) and the large majority of strong MEGAs (Metropolitan European Growth Areas) which hold highly developed RTD, financial and tertiary education activities, company headquarters etc. It also benefits from a stronger networking/complementarity among Functional Urban Areas facilitated by a high accessibility. In the present context of accelerating globalisation and growing external competition, of rapid technological development and of further European integration, the global European urban system is subject to both polarisation and dispersal forces. The pentagon, understood as the area comprising the leading European urban functions, tends to expand along major corridors in various directions: towards the East, as a consequence of the recent EU enlargement, especially along the corridors leading to Vienna/Bratislava/Budapest, Prague and southern Poland, Berlin and Warsaw, but also towards the north (Copenhagen and southern Sweden) and towards the south (Rhone valley and connection to the metropolitan areas of the "Latin Rim"). In England, the pentagon

progresses towards the Midlands. The peripheries of the EU territory contain comparatively few MEGAs, unequally distributed over different macro-regions. The urban systems of the European peripheries are often characterised by a stronger hierarchy between cities and towns, according to their size and by much lower interactions and synergy within the urban system.

Intermediate level

Polycentricity at national level depends to a large extend upon national situations. In southern European regions, strengthening the role of the capitals and other large cities in EU-wide perspective often occurs at the expense of polycentricity at national and/or regional levels. In the new member countries, a similar process is taking place. Restructuring (before and after the enlargement) favours the bigger cities, mainly the capitals, while cities with a large, obsolete industrial sector as well as medium-sized and small cities located in rural areas are often subject to decline. This evolution creates serious goal conflicts for future EU spatial policy oriented towards a balanced, polycentric territorial structure of Europe. In the context of accelerating globalisation and of enterprises' relocation towards countries with low-wages and booming markets (Asia in particular), medium-sized towns are generally more affected than metropolitan areas, both in Eastern and Western Europe. It should not be concluded, however, that only regions with very large cities are prone to growth. In present European society, the residential and tourist economy plays an ever increasing part and favours a number of rural regions, provided they are attractive and easily accessible. The increasing number of retirees is strengthening the residential economy of numerous regions in Europe. European integration is also an important factor for the development of urban systems at the intermediate scale. Networks and clusters of cities are emerging in various transnational areas such as the Baltic Sea Region or the so-called Triangle[14] of Central and Eastern Europe. The new TEN-T as well as the EU support mainly through the INTERREG programs (though this support remains limited) also enhances the potential for empowering Transnational Urban Systems in the meso-regions of the EU periphery.

Local/regional level

A significant diversity of factors generate important, and sometimes contradictory dynamics in urban systems considered at the local/regional scale. Despite general population ageing and decelerating population growth in Europe, large cities, especially the metropolitan areas, are still subject to population growth. This is not only a consequence of the changing structure of the European economy with its stronger emphasis on services and high-tech and R&D activities, but also of internal and international migrations. The population of large cities remains generally younger than the respective national averages and continues to grow, while numerous retirees move towards rural areas. Further suburbanisation and sprawl can be observed in and around many European metropolitan areas.

Mobility at regional scale is an important characteristic of modern society, comprising commuter flows related to home-work journeys, but also to education, culture and leisure activities. Mobility had generally increased and has become more diversified in nature and in time. Increasing motorisation generates larger flows of car traffic, in particular in the countries of Central and Eastern Europe where a clear catching up process is taking place. In western cities, the development and modernisation of public transport cannot completely compensate for the growing demand in mobility. Increasing car traffic and related emissions is also therefore an important issue. ICTs are playing an ever increasing part in the provision of public and private services (e-commerce, e-administration etc.) and in home-

[14] The recent enlargement undoubtedly enhanced the development potential of the "Triangle"[14] in Central Europe which covers the transnational territory between Warsaw in the east; Poznan (and possibly Berlin) in the west; and Krakow, Saxony (Dresden), Prague, Bratislava, Vienna and Budapest in the south.

working. There is however so far no clear evidence that ICTs have positively contributed to curb physical mobility. The strong and sustained increase of energy prices (oil and gas) is already having impacts on urban settlements at the local/regional scale. Stronger use of public transport and increased car-sharing can be observed. The need to shorten commuting distances through different choices in residential location can also be perceived. Much stronger impacts can be expected in this field in years to come, with a general evolution towards more compact cities or settlements and better integrated urban functions, even if driving forces towards suburbanisation are not eliminated.

A growing issue in a number of European cities is that of the economic, socio-cultural and educational integration of population groups (in particular the young) and often originating from immigration. Although the origin of the problems is often economic in nature (very high unemployment rates caused by lower educational level and greater difficulties of integration in the labour market), the impacts are being felt more widely in the socio-cultural sphere with the strengthening of ethnic or religious communities and trends towards radicalisation. The social divide in cities is growing; cities become more fragmented and various forms of segregation are progressing. This issue can be considered as a very serious one with strong impacts in the years to come.

2.7.2 Evolution of rural Europe

Diversification of rural areas

Rural areas are diversifying more and more. Rural areas in urbanized regions situated on the periphery of important agglomerations (especially in the pentagon) and near large cities often benefit from the presence and development of residential areas, industrial estates, and recreational amenities. They are affected by intense socio-economic dynamics in terms of population density and urbanisation. This reinforces the scattering of settlements and the pressure on land-use. Many coastal areas have a well developed tourist industry and can be characterized as rural areas attractive for tourism. The same is true for mountain areas. The tourist industry contributes to a high economic viability and to the in-migration of many young people from surrounding areas. In high seasons, however, nature, landscape and environment are put under pressure. Rural areas where agriculture dominates can be divided into two subcategories: areas with a highly productive agriculture and in which the processing industry plays an important role, which have a high or moderate socio-economic viability, and areas with low productivity in which agriculture is traditional and which have a low socio-economic viability. In the first category, intensive large-scale agriculture generally puts the environment under high pressure, while in the second category, the environment is under lower pressure. Another category of rural areas can also be identified, which are highly dependent on agricultural activities but where additional activities, like service for out-door recreation and manufacturing generate additional incomes. Socio-economic viability here is moderate: in some areas agriculture survives; in other areas the economic structure becomes more diversified. Landscape elements are developed to some extent in these areas. A number of these areas are attractive for the location of retirees and so develop a residential economy. Rural areas with low accessibility, e.g. mountain and peripheral areas are characterised by large natural landscapes and/or small cultural landscapes dominated by marginalised agriculture. The out-migration of young people results in the ageing of the population. Many such areas loose the critical mass which is necessary for the maintenance of services.

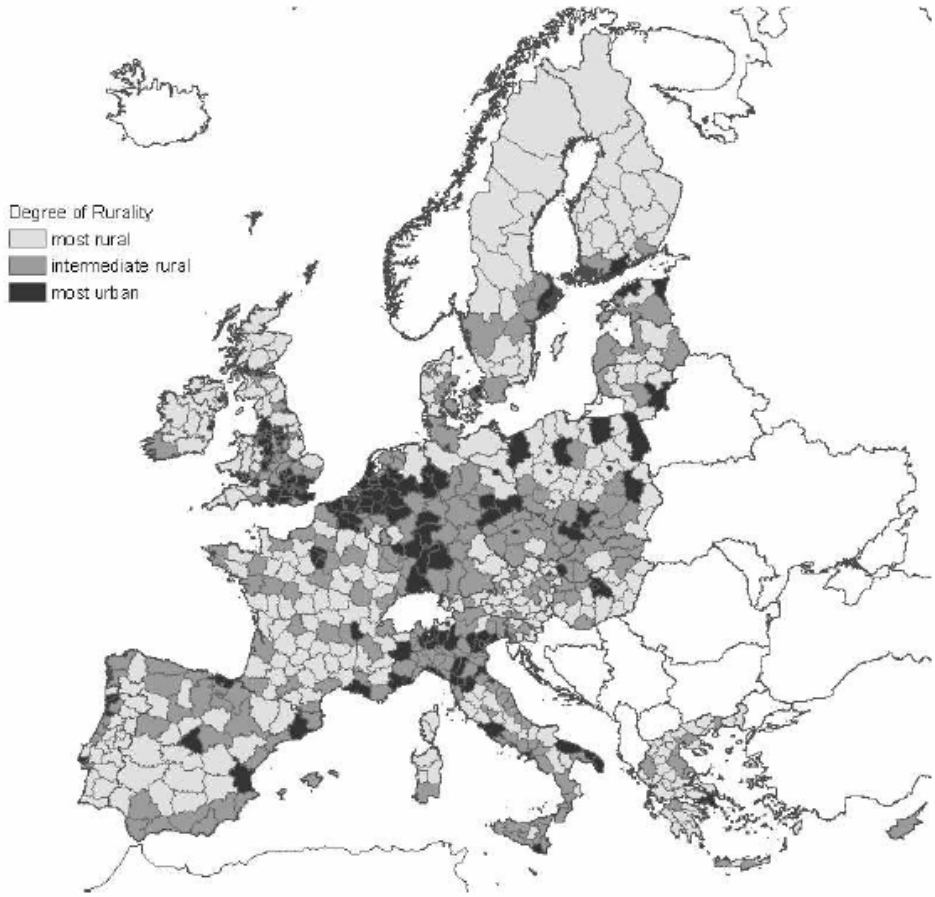


Figure 12 Degree of rurality[15]

Evolution of agricultural systems and impacts of the CAP and Rural Development Policy

Agricultural and forestry activities concern nearly $^{2/3}$ of the European terrestrial area. The sectoral contribution of agriculture to total GVA (Gross Added Value) is limited to a few percent, both in the EU-15 and the new member states. However, in most rural regions this share is higher, varying from 3% in the most rural regions of Germany, Austria and the UK, to 15% in Estonia and Latvia. On the whole the share of agriculture in GVA is below that of its share in total employment, revealing a relatively low productivity per agricultural worker, sometimes enhanced by underemployment of agricultural labour[16]. Agriculture has been experiencing substantial *structural changes*. In the EU-15 the number of farms dropped from 7.4 million in 1995 to 6.8 million in 2000. Small farms (0-5 ha) dominate, with 3.9 million in 2000. Only 0.6 million farms are larger than 50 ha. In 2000, the average area of a farm in the EU-15 was 18.7 ha. The difference between member countries is remarkable:

[15] Source : Scenar 2020, "Scenario study on agriculture and the rural world". European Centre for Nature conservation et alia. First interim report March 2006. European Commission. 2006

[16] Scenar 2020 p 48-50 "Scenario study on agriculture and the rural world". European Centre for Nature conservation et alia. First interim report March 2006. European Commission

the smallest average areas existed in Greece (4.4 ha) and the largest in the UK (67.7 ha). In the CEECs the number of holdings is large: 9.2 million (30% more than in the EU-15). Cultivated land, however, amounts to 50 million ha (40% of that in the EU-15). In all CEECs the share of small holdings in the total number of farms is high: from 42% in Latvia to 97% in Bulgaria. Most of them are subsistence farms. Large farms (more than 50 ha) include mainly commercial companies and co-operatives.

Regarding agricultural production the following trends can be observed. The production of *major crops* continued growing. Community support to cereals, oilseeds and protein seeds as well as a fall of the number of cattle induced an increase in the crops for sale. The CAP reform of 1992 only modestly affected this major trend. *Permanent crops* decreased. Between 1975 and 1995, *surfaces still in grass* decreased by 12% in the EU-9. The cattle and sheep rearing areas in plains were most affected. Only some cattle-rearing areas (e.g. Ireland, Limousin, Umbria) saw their surfaces still in grass increasing. The period was marked by the milk quotas (1984) and the decline of livestock-farming resulting from it. A dualisation process of agricultural production has taken place. Concentration and intensification of production occurred in the most fertile areas while more extensive agriculture and agricultural abandonment took place in LFAs (Less Favoured Areas). In the new member countries, the existing dualisation is also a major problem. Intensified arable and diary farming have caused serious damage to landscapes and the environment in open fields, polders and deltas. The scaling-up of production has also occurred most profoundly in these areas. In many British areas bocage landscapes changed into open fields. There are also many areas in which agriculture is marginalising, e.g. in mountain areas. Pollution by agriculture has been reduced but not stopped. The intensification of production, particularly cereals, is still topical. The expansion of irrigation also contributes to it. Livestock-farming in or near the cereal areas further intensifies. Positive developments, however, can also be observed. Between 1992 and 2001 for instance, 500,000 ha have been afforested.

The CAP, having its foundations in the *Treaty of Rome* (1957), was established to counter the fluctuations in the availability and prices of food and to raise the level of production. The most important measures were income support, price support, import tariffs, and export subsidies. The CAP was so successful that within 20 years Europe produced more than enough food for its own population. Exports were rising sharply and surpluses mounting. The philosophy of the CAP then changed (McSharry reform of 1992, Agenda 2000) due to international pressure and internal policy and budgetary considerations. The most important changes have been a shift from market price support to income support, and the de-coupling of income support from production, being linked instead to public goods such as environmentally friendly land management, public and animal health. While the reform process brought about a significant reduction of export refunds and public intervention as compared to the earlier years of the CAP, there are still a number of markets which rely on these forms of support. Import tariffs still play an important role in supporting agricultural prices. The WTO Doha Round, although currently faced with difficulties, foresees the phasing out of export refunds, a reduction of import tariffs and increasing market access. This might well lead to necessary adjustments of a number of market organisations, in particular as regards cereals and dairy.

2.8 Territorial cohesion and spatial integration at stake

Polarisation and dispersal

In the early 2000s, a number of trends have been pushing Europe towards territorial cohesion, while others are counteracting such processes. The concentration of population and activities in the central parts of the European territory is the dominating factor of territorial imbalances. At EU-15 level, this is exhibited in a high concentration of economic activity and population in the central area or pentagon which covers 18% of the EU15 land area while accounting for 41% of population, 48% of GDP and 75% of expenditure on R&D. New trends however show signs of a more balanced development, with the growth of a number of urban areas in peripheral parts of the EU, including[17]:

• an extension of the core towards the east with growth of cities such as Berlin, Munich and Vienna;

• capital cities in Scandinavia, Stockholm and Helsinki, in particular, have become strong economically, especially in new technologies;

• a number of urban areas in peripheral parts of the EU, such as Dublin, Athens and Lisbon, have also experienced significant growth in GDP per head over the past decade;

• a number of urban regions located outside the core seem to have a population and economic potential strong enough to attract research activities and to link up over time with the main European, and even international, centres of decision making. These appear to be capable in the future of stimulating the growth of peripheral areas and of bringing about a better balance of economic development in the EU.

In applying the methodology developed in the Final Report of ESPON project 3.1, it is possible to measure the economic and demographic polarisation, based on a multi-scalar computation of economic and demographic potential using various spans of 'gaussian smoothing'. The following map is the synthesis of 4 criteria: Local demographic polarisation (LDP), Medium demographic polarisation (MDP), Local economic polarisation (LDP), Medium economic polarisation (MEP). A synthetic index of polarisation is then calculated[18].

Factors favouring and counteracting territorial cohesion

Demographic factors with long-term significance are likely to favour some countries and regions and to disfavour others in terms of both labour markets and the national/regional consumption of goods and services. In a Europe-wide perspective, countries and regions with the most constraining demographic evolution (strong population ageing and negative outmigration balance) are to be found in the eastern periphery (large parts of the new member countries with the exception of Poland, Cyprus and Malta) and in some parts of the southern, northern and western peripheries (a large proportion of northern Spain and of Portugal, western Scotland, much of Sweden and eastern Finland).

[17] Third Cohesion Report. 2004. P. 27-28
[18] See methodology in the appendix 2

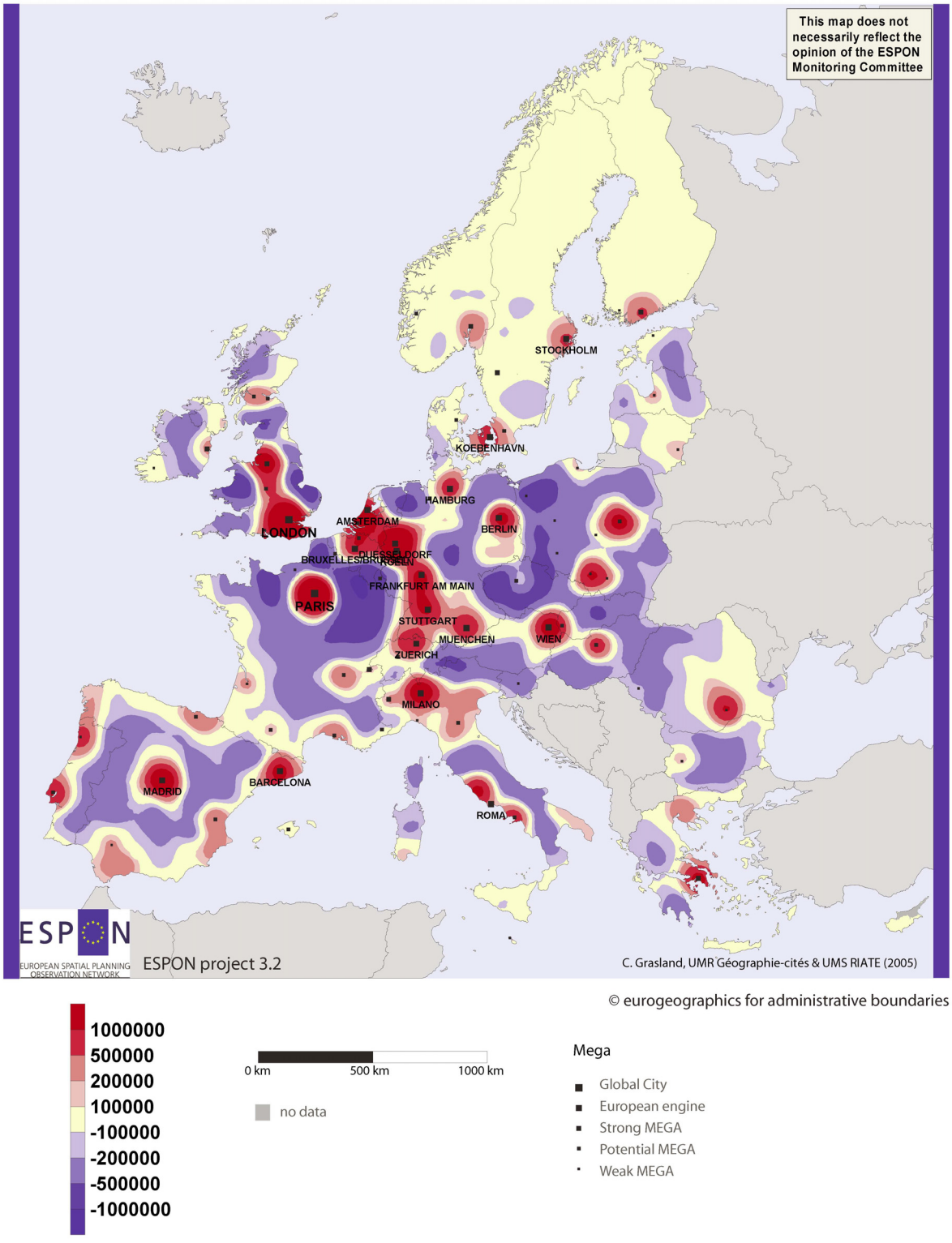
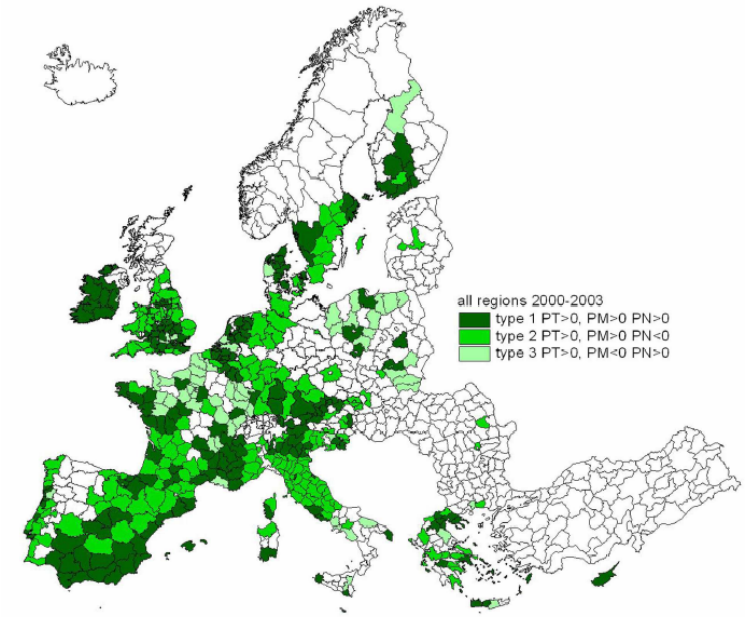


Figure 13 Polarisation and dispersal areas

In the more central parts of the wider Europe, this type of negative evolution can mainly be identified in large parts of the new German Länder (with the exception of Brandenburg) and in central France (northern parts of the Massif Central).

Demography can be considered as a positive factor for the evolution of various countries and regions. These are largely concentrated in the central parts of the wider Europe, such as the regions of the "Blue Banana" (encompassing the Benelux countries, Alsace, northern Switzerland and southern Germany) as well as the regions of the French Atlantic coast, the Loire and Rhône regions, parts of Catalonia. But they also comprise a large number of peripheral regions, especially the metropolitan ones (hence metropolitan regions of Thessaloniki, Lisbon, Porto, Copenhagen, Stockholm, as well as wide areas of Ireland, southern Spain, southern Norway, southern Finland and western Poland).

All types of regions with a positive population development



All types of regions with a negative population development

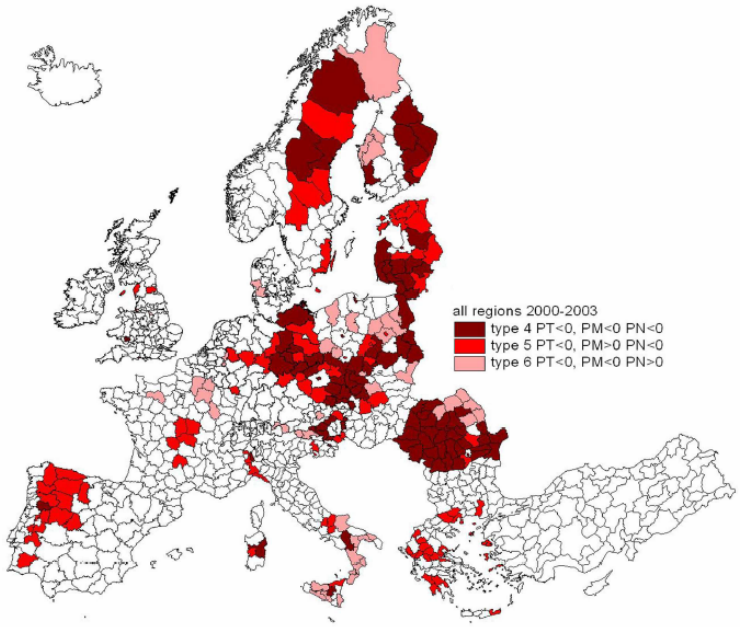


Figure 14 Types of demographic development (PT=Total population variation; PM= migration balance; PN= Natural population variation)[19]

[19] Source : Scenar 2020, "Scenario study on agriculture and the rural world". European Centre for Nature Conservation et alia. First interim report March 2006. European Commission. 2006

Accelerating globalisation naturally favours the regions with the most advanced economies or with specific comparative advantages, such as a low-wage labour force. In this respect, in Europe metropolitan areas are largely favoured, when compared with the more rural areas, but a number of east-European regions are witnessing significant foreign investments because of lower labour costs. The east/west divide is progressively being replaced by a metropolitan/non metropolitan divide and this trend is likely to become stronger over time, although a number of factors, such as the proportion of the population which is highly educated, expenditure in R&D activities and the registration of patents still favour most western regions, especially those of the pentagon and of Northern Europe.

With regard to accessibility and transport infrastructure endowment, Europe is characterised by a clear east-west divide in terms of motorway density by inhabitant. The regions of the pentagon are clearly favoured, but also a large number of Spanish and Portuguese regions with low population density and having benefited from significant EU supports for the development of their transport infrastructure. A catching up process has started in Central and Eastern Europe and is favouring mainly the major corridors connecting metropolitan areas, between themselves, and with the EU-15. The picture is rather different when it comes to potential European multi-modal accessibility. The divide is clearly between the pentagon and the peripheries, irrespectively of their eastern, southern, western or northern location. A striking aspect of this differentiation is that large parts of the new member countries of Central and Eastern Europe, especially the parts adjacent to the EU-15, have a multi-modal accessibility level much higher than that of a number of EU-15 peripheries, such as Greece, southern Italy, the southern and western parts of the Iberian Peninsula, Ireland, northern Scotland and the Nordic countries. The new member/accession countries and regions with very low European multi-modal accessibility are in particular the Baltic States, Bulgaria, the eastern parts of Romania, Cyprus and Malta. The accelerated development of transport infrastructure in the new member countries will be of advantage to them, but it will not fundamentally change the pattern of multi-modal European accessibility, which has more to do with the geographical position of regions (centre vs. periphery) than with the real endowment of transport infrastructure.

In terms of territorial cohesion, the emerging new energy paradigm is likely to have diverging impacts. It certainly will be less detrimental for the regions and local economies least dependent upon transport functions and costs. These are the more central regions of the pentagon. It will also be less harmful to the regions with a lower share of traditional, energy-consuming manufacturing activities. The regions which will benefit from it are those where renewable energy can be produced or exploited, such as fertile rural regions and forestry regions (biomass and bio-fuels), southern regions (solar energy), coastal and hilly regions (wind energy), Atlantic coastal regions (wave and tide hydropower). Regions with mild climates will also be less disfavoured. The new member countries of Central and Eastern Europe are in a unique position regarding the new energy paradigm. On the one hand, they are strongly developing their road and motorway networks under the pressure of growing motorisation, though they do have pre-existent and extensive, but partly obsolete, railway networks. This evolution is likely to make them more vulnerable to strongly increasing oil and gas prices. Their economies also have higher energy intensity in than in Western Europe. On the other hand hand, the share of solid fuels in their total energy consumption is still much higher than in Western Europe, a fact which protects them from growing oil and gas prices. Recent transport policies, not only in the new member states, favour again road transport against more sustainable transport modes. It seems that this evolution, which is driven by a more liberal approach to the economy and by the need to boost economic development, has not yet taken account of the new energy paradigm. In more general terms, the new energy paradigm will certainly be an obstacle to the development of mobility and it will favour substitution to physical mobility through

telecommunications. It is also likely that the location patterns of households will change and will favour areas well serviced by public transportation at the expense of locations distant from cities and only accessible by cars. More compact cities will result from this evolution.

As far as the potential geographical spread of climate change impacts is concerned, a first, tentative attempt to regionalize impacts in Europe is presented below. Two aspects are taken into account; the impacts themselves, and possible mitigation and adaptation measures:

- *Coastal plains and delta areas* are confronted with increasing risk levels of inundation. These are parts of the Baltic states, Denmark, northern Germany, the Netherlands, Belgium, some deltas in the UK, France and Spain.
- *River valleys in Northern and Eastern Europe* will have to deal with increased flooding. Adaptation measures are infrastructure and movement out of river valleys.
- *Mountainous areas* are vulnerable in two ways: one is decreasing winter tourism as a result of declining snow cover; a second is the frailty of ecosystems, since species have no place to migrate to when ecosystems are shifting to higher altitudes as a result of global warming.
- *Southern European agricultural areas* will be affected by water shortages. Savings on water use will be a big issue, as well as the possibility of exploiting water resources over large distances and at substantial environmental cost.
- *Southern European cities* are confronted with water shortages and heat waves. The same effects as for agricultural areas hold true. These problems might affect quality of life in such a manner, that these cities loose attractiveness and people and businesses start to move out.
- *Southern European tourism areas (coasts)* could suffer a decreasing number of visitors in summer due to risk of heat waves and water shortages, although there might be sharp increase in the number of visitors in other seasons.
- *Northern European fringe north of current agricultural areas* might prepare for increasing possibilities of a change to agricultural production. Opportunities of income generating activities will have to be balanced against the cost of building infrastructure and giving up existing land use (forest plantations, nature)
- *Depopulated areas in southern Europe* are now facing problems of desertification. Natural processes would aggravate this problem. However, forestation programs could become beneficial if sink areas are being paid by climate change policies, leading to vast tracks of forested areas.
- *Depopulated areas in Northern and Eastern Europe* can be attractive not only for forestation to create carbon sinks, if technological developments switch towards the use of bio-fuel, these regions might convert themselves to one of the world's main producers.

Summing up, the territorial impacts of climate change are likely to be rather detrimental to territorial cohesion, although a number of rural or peripheral/disadvantaged regions could draw some benefits in the future, in particular in the northern half of the EU.

It is important to observe that close interactions exist between climate change and the energy sector. Such interactions are numerous and of varying nature. While the general 'warming up' is reducing energy demand for heating (spring, autumn and winter time), it also increases energy demand for air conditioning, in particular in southern regions. Increasing drought is detrimental to the production of energy crops and biomass in the southern European regions and related forest fires reduce the availability of wood for heating. Drought is also responsible for the reduction of hydro-power potential in southern regions and therefore for the increase of demand of other types of energy supply, including the traditional polluting ones. The ongoing changes in the present balance between climate and energy are therefore rather detrimental to territorial cohesion.

In the early 2000s, a number of new technologies have been emerging in a variety of fields (biotechnologies, nanotechnologies, new forms of energy and transport technologies, ICT etc.). The territorial impacts of the generalisation and maturation of such technologies will very much depend upon the use which is made of them. It is rather difficult to anticipate whether or not they will be favourable to territorial cohesion. It seems however that a number of these technologies have a potential for benefiting territorial cohesion if they are properly applied. These are in particular biotechnologies and new technologies related to the exploitation of renewable energy sources which may benefit a number of rural areas. Such include those located in the European peripheries; the further development of ICT which may enable the de-concentration of activities out of metropolitan areas and reduce passenger transport needs and the extension of the HST networks towards more peripheral regions (Eastern Europe, Iberian Peninsula).

The present evolution of the transport sector is rather contradictory as far as territorial cohesion is concerned. The renewed emphasis, in recent years in a number of member states, on road transport (in opposition to the recommendations of the White Paper) enables the improvement of accessibility in peripheral regions, the (provisional) reduction of congestion in the more central ones and the catching up of the new member countries in terms of infrastructure endowment. In this respect, it can be rather beneficial to territorial cohesion, provided there are not more investments in motorways in the central regions than in the more peripheral ones. With respect to the changing energy paradigm, present policies favouring road and motorway transport should be considered as short-term ones, because the steady oil price increase will be detrimental to road transport in general and demand for other transport modes is likely to increase. In particular the regions most dependent upon road transport, which are generally the most peripheral ones, are likely to be more affected than others by changing energy supply conditions. The objective of territorial cohesion calls for a reconsideration of transport policies integrating the new energy constraints as well as a higher degree of sustainability.

Environmental sustainability, as a component of territorial cohesion, is improving in a number of fields thanks to EU regulations and also to changes in the European economic structure, but new threats are also emerging. The Framework Water Directive in the EU is likely to contribute significantly to the conservation of water resources along river basins. Climate change is likely to further constrain the availability of water in the southern European regions, which is already a severe problem in various Mediterranean regions and also along the southern Atlantic coast. A potential risk exists of a revival of intensive agriculture related to the production of energy crops and of raw materials for industrial purpose. As far as natural areas are concerned, the implementation of the Natura 2000 programme is undoubtedly a sign of progress, but a reduction of protection measures in semi-natural areas outside the Natura 2000 schemes can be observed (because of the lack of resources, which are mainly absorbed by the Natura 2000 sites). Natural areas in southern Europe are increasingly threatened by drought which regularly causes devastating forest fires. The abandonment of a number of rural areas (desertification) is damaging for cultural landscapes. Pressures on natural areas are also being observed on numerous coastal regions, resulting from the steady densification process.

A number of changes in lifestyles are likely to have impacts on territorial cohesion at the micro-scale. Mobility for instance, is a factor of behaviour affected by contradictory trends. Recent decades were characterised by significant trends of increasing short and long distance mobility and increasing motorisation rates contributed to this. Changes in mobility are noticeable, under the influence of both ICT (tele-work, e-shopping, e-services) and, even more, of increasing energy price. With population ageing, mobility patterns are also changing. Settlement systems will be affected by new mobility trends. Changes can also be observed in leisure patterns. New forms of tourism are developing, with shorter duration but with higher cultural or activity content. Most important changes in lifestyles have taken

place in the new member states during the transition period and are still going on: the most significant features being travelling; changing consumption patterns and increasing motorisation.

Territorial integration is progressing throughout Europe. Economic, societal and technological factors contribute to it. The most striking manifestation has been the progressive integration between Eastern and Western Europe since the 1990s after several decades of the Iron Curtain. Less impressive but also powerful is the territorial integration along national borders within the EU and also with Switzerland and Norway. Interactions of various types are strengthening (home-work relations, leisure, shopping, access to services and education etc.). Although a similar process is developing in the new member countries of Central and Eastern Europe, cross-border permeability remains limited[20]. Thus while in the past, a relatively dense network of roads and railways connected the accession countries with neighbouring third countries, according to estimates, just 40 percent of existing roads and 50 percent of existing railways crossing these borders are currently used as international border crossings. Some roads can be used only by citizens of the two neighbouring countries or regions; some are open only for a few hours daily; some are open only on holidays or during special events; and others are never used, for example when rails have been removed.

[20] ESPON in Progress. Preliminary results by autumn 2003.

3. Integrated baseline (trend) scenario

3.1 Objectives and principles of the integrated baseline scenario

By nature, a baseline scenario is based on the continuation of trends and on the principle that no major changes occur in main-stream and on-going policies applied which have played a part in shaping them. It is however important to consider that in certain fields, such as demography, the evolution over past decades (structural development of the European population, with decreasing fertility rates and mortality rates, leading to population ageing) is also valid for the coming decades, while in other fields, such as energy (particularly price), the recent developments seem much more relevant for the future, than trends over a longer period. In addition, a baseline scenario has also to consider a number of policy measures adopted recently (such as the Kyoto agreement), even if the impacts of such measures are not yet well known. In other words, a baseline scenario is not identical to the extrapolation into the future of long-range past evolutions.

3.2 Hypotheses of the integrated baseline scenario

Demography	- Reduced population ageing as a result of lower fertility and mortality rates - Stable total European population (+ enlargement) - Increasing, but globally controlled external migration - Unchanged constraints on internal migration
Economy	- Slowly increasing total activity rate - Slowly growing R&D expenditure, but constant technological gap vis-a-vis the USA - Decreasing public expenditure
Energy	- Steady increase of energy prices - Stableor decreasing European consumption - Increasing use of renewables
Transport	- Continued growth of traffic, but moderately curbed by energy price with possible modal shift - Constant increase of infrastructure endowment, but below demand needs - - Partial application of the Kyoto Agreement
Rural development	- Further liberalisation of international trade - Increasing industrialisation of agricultural production, including the production of bio-fuels - Further diversification of functions of rural areas; stronger dependence upon the residential economy and new forms of tourism - Progressive reduction of CAP budget
Socio-cultural sector	- Heterogeneous and insufficient policies related to integration - Growing ethnic, religious and social tensions
Governance	- Increasing co-operation between cross-border regions - Increase in multi-level and cross-sectoral approaches, but

	limited to specific programmes (rural development); - Maintenance of competition and incoherence between - policies devoted to innovation and competitiveness and - others devoted to cohesion
Climate change	- Moderate overall climate change (+1°) - Increase in extreme local events - Moderate emission levels due to new technologies - Few (too few) structural adaptation measures
Enlargement	- Bulgaria & Romania by 2007 - Western Balkans (with Croatia acceding first) By 2020 - Turkey By 2030 - Continued combination of deepening and widening - Modest impact of neighbourhood policy

3.3 Scenario process

Demographic changes and related territorial impacts

From 2005 onwards, the demographic evolution in Europe shows a basic pattern of accelerated ageing. This pattern is however far from being homogeneous in all European countries or regions. The ageing process already observed in the early 2000s has been amplifying up to 2030, despite a revival of fertility rates in a number of countries[21]. By 2030, most of European regions have reached a median age above 45 years, with a number of regions even above 50 years: north-west Spain, northern Italy and Sardinia, Corsica, East-Germany, Scotland, central Sweden. A few exceptions are western and southern France, England, Ireland, southern Norway, southern Finland and a few regions along the eastern borders of the EU. The regions with lowest median age in 2030 are metropolitan regions of Northern and Western Europe like Paris, London, Brussels, Amsterdam, Hamburg, Luxemburg, Stockholm, Helsinki, Oslo, Copenhagen, etc. More generally, population ageing is slower in north-west European regions than in eastern and southern ones. Life expectancy at birth remains much higher in Western than in Central and Eastern Europe. The worst situations are observed in Romania and Bulgaria, the most favourable in southern France, northern Spain, Italy, Switzerland, Austria and southern Sweden. In terms of demographic potential (ISDD Index of Sustainable Demographic Development combining life expectancy at birth and median age), the Nordic regions, Ireland, the London metropolitan area, Ile-de-France, Rhône Alpes, Nord-Pas de Calais and large parts of Benelux are in more favourable situations, Cyprus, Crete and North Portugal showing in general rather stronger demographic potential. The situation in other parts of Southern and Eastern Europe is however generally weaker and regionally divergent.

The ageing process has many impacts on European society. Larger and larger cohorts of people are retiring from professional life, precisely those born during the baby boom of the 1950s. This significantly influences the labour market. In a context of accelerating globalisation, of progressing knowledge economy and of related economic adjustment and restructuring, demand for highly skilled people is growing in Europe. The shortage of highly skilled people becomes therefore accentuated, despite the fact that the proportion of university graduates in the new generations becomes higher. Competition between regions in attracting young skilled people is increasing, not only within individual countries but also in the cross-border context and, more generally, at trans-national level. Although the large number of retirees and the growing demand for workforce in the sectors of health care and

[21] The method used for the calculations is described in Appendix 1

of social and cultural services for the elderly are supposed to alleviate unemployment, the high proportion of people without sufficient qualifications to successfully integrate into the labour market and the large number of illegally employed low-skilled people strongly reduce the opportunities for a more balanced labour market.

A closer examination of the demographic evolution at more regional and local scales reveals widely diverging situations. Population is generally growing in metropolitan areas, both in Western and Eastern Europe, under the combined effect of higher fertility rates and of the attraction of migrants in relation to the development of advanced economic activities, with a number of exceptions generally in old industrial regions. The knowledge economy favours metropolitan regions, in both Western and in Eastern Europe. Large cities also attract the majority of unskilled immigrants. By contrast, a quite significant number of rural areas in the eastern and western peripheries, but also in some central parts of Europe (especially in Germany, central and northern Italy), are becoming more and more depopulated under the effects of advanced population ageing and/or of the out-migration of younger age groups.

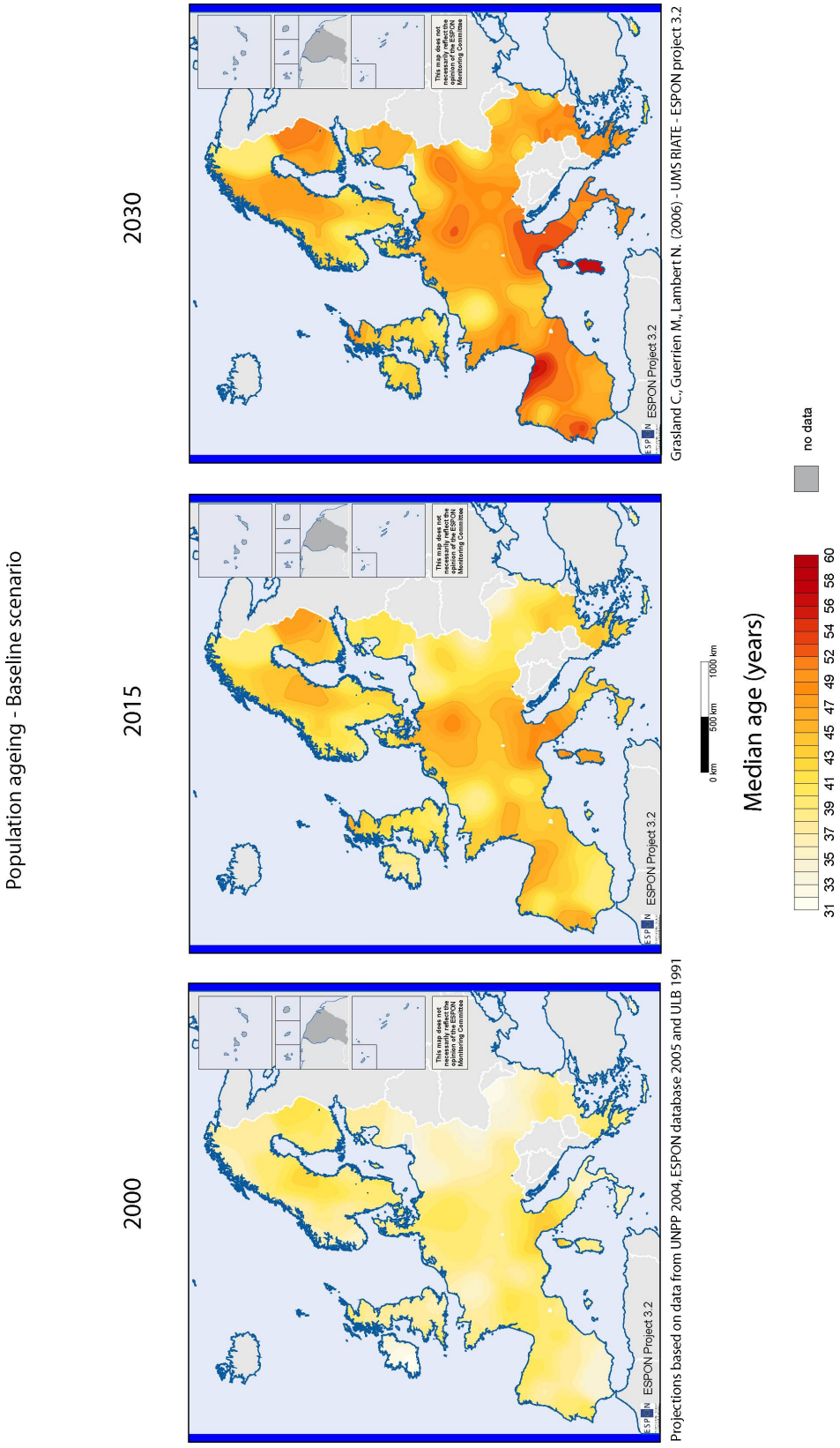


Figure 15 Population ageing

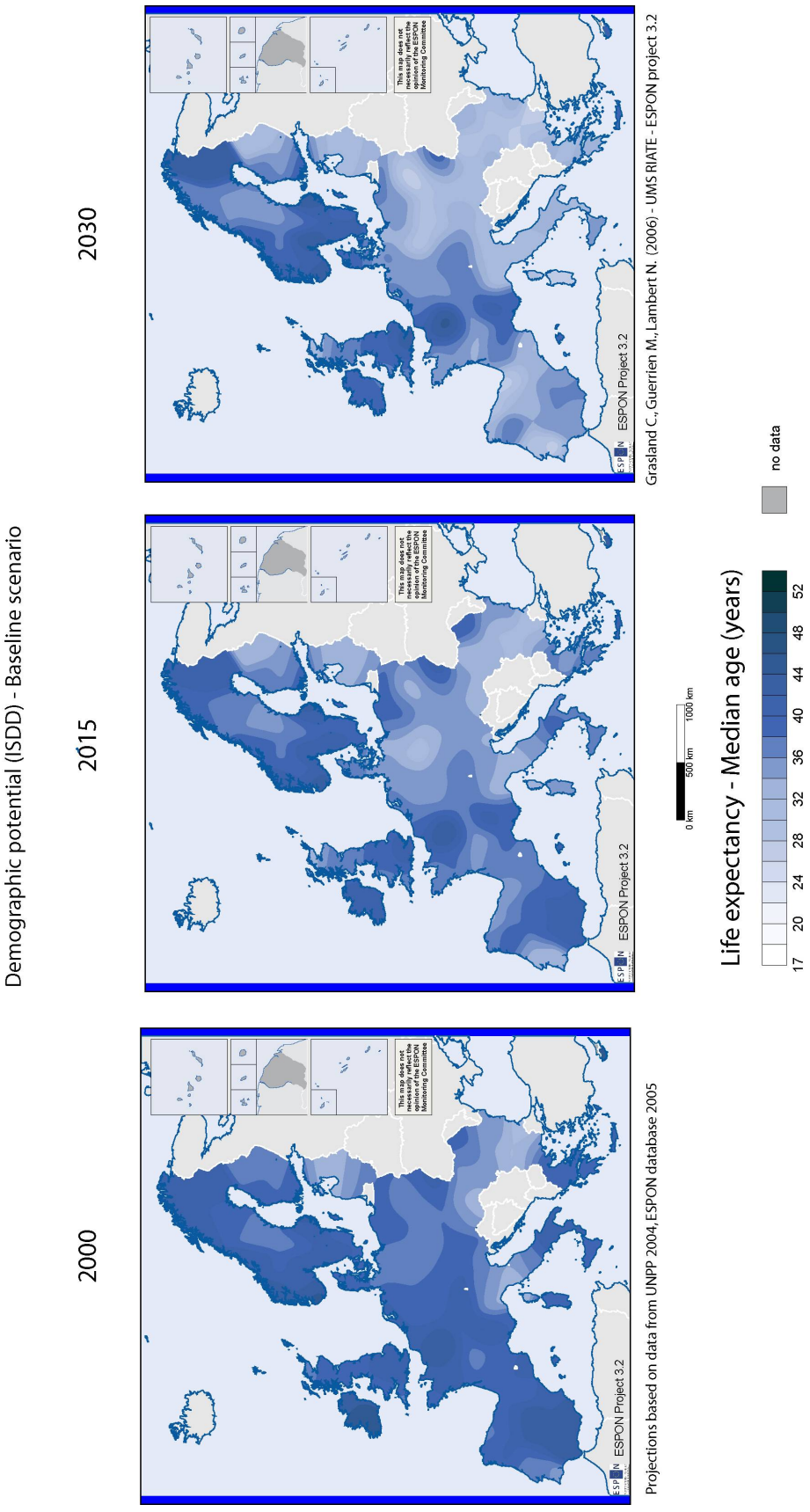


Figure 16 Demographic potential (ISDD)

This trend is particularly significant in most parts of Central and Eastern Europe and in the western European peripheries. Some exceptions are Andalusia, Ireland, most parts of Finland and of Portugal and central Scotland). In between, one can find a large diversity of situations. A quite large number of attractive rural or medium-density areas, especially in Western Europe are subject to population increase, as a result of the migration of retired people and of free-lance workers from large cities towards areas with a better environment. In this respect, coastal areas are particularly favoured as well as the piedmonts of mountain regions. The regular influx of newcomers counterbalances natural population decline in a number of these attractive areas. Even in a context of general ageing, they can thus achieve demographic stabilisation in the long term. There are however also numerous areas with low or intermediate density where the stabilisation process cannot cope with the natural decline of the population and where, accordingly, population is diminishing, apparently permanently. In a number of these regions, the situation is not tragic, but the number of empty houses increases. In others, demographic decline is stronger and has detrimental impacts on the vitality and attractiveness of the whole region, because the quality of public and private services is declining and new investments are barely made, a process which accelerates the ageing of buildings and infrastructures.

Immigration from outside Europe is contained by public policies, but not really stopped. The process of illegal immigration continues, bringing into Europe mainly people with low education and skill levels who are facing tremendous difficulties in becoming integrated into society and the labour market because of their legal status. The European Mediterranean regions, especially in Spain, Italy, Greece, France and Cyprus are subject to strong immigration pressure. In the countries of Central and Eastern Europe, immigration from countries farther to the east (Asia, the Caucasus and Middle East) intensifies. Immigrants generally locate in large cities, but a growing number of them also locate in intermediate and rural regions where ethnic communities also develop. The socio-economic integration of specific population groups (in many cases young generations of non-European origin) progressively becomes a serious issue in numerous European countries and generates different socio-cultural manifestations. Youth unemployment is a key factor and it fuels the polarised development of some ethnic and/or religious communities and groups. Measures are being taken at local level, but incoherently and with insufficient resources to really alleviate and solve the problems. Periodically, violent demonstrations and riots take place in metropolitan areas. Reactions to this take various shapes, from political radicalism and increasing xenophobia to the development of protective measures, including population movement to the rural areas surrounding cities or the development of gated communities near large cities and in high-level tourist and retirement areas. The counterpart of this evolution is the development of derelict sites with multiple deprivation in cities and suburbs. Socio-economic dualisation and socio-spatial segregation is progressing in numerous European cities.

Territorial footprint of economy and technology

Globalisation is an ongoing process stretching over the period until 2030, driven by declining transaction costs and a growing openness of the markets for capital, goods and services. Not only are trade flows growing between Europe and non-European countries, but intercontinental interactions in the ownership of businesses are also significantly developing. While a number of European enterprises become world leaders in their specific sectors and expand their activities to other continents, growing parts of the European economy are also owned or controlled by non-European multinational enterprises. The European economy is still too fragmented to face successfully the accumulation of capital in energy producing and other emerging countries. The global European policy tries to cope with the challenge of

both widening the EU and deepening the integration process, especially through the Lisbon Strategy. The adoption of the "acquis communautaire" in the new member countries also allows for the reduction of transaction costs, with a positive impact on trade and on FDI. Europe as a whole benefits from the new enlargements. The international division of labour undergoes further progress and the competition among regions becomes stronger. Although labour mobility restrictions are progressively given up by various EU-15 countries, re-location of firms towards the new member states continues.

Technology is progressing in a variety of fields. ICT use in production is rapidly changing work organization in the business sector. Not only are intra-firm procedures being re-organized with related productivity gains, but the re-organization of inter-firm relationships with customers and suppliers is of even greater importance. Significant added value is generated by the networking of efforts, especially in the R&D sector. ICT also play a major part in the internationalisation of services, as well as in public and domestic activities. Biotechnologies are producing a true breakthrough with a wide diversity of applications. Concerning green biotechnology, the production and cultivation of plants as raw materials for industrial use and industrial production plants are spatially combined in order to reduce transportation costs. The expansion of gene-modified products calls for a variety of new activities, including control and certification, R&D as well as separate distribution and logistic channels for gene-modified and traditional products for agriculture and food industries. The cultivation and transformation of energy crops are rapidly developing, leading to the mass production of new bio-fuels. Numerous applications of biotechnologies are also emerging in the field of environmental protection techniques and pharma-industries. Research, development, and production in the field of red biotechnology in regions with public and university research infrastructure is further developing. Grey biotechnologies find new applications, in particular in the new member countries, especially in relation to water purification and supply. Similarly, nanotechnologies become more widely applied, especially in the field of environment and health protection. New technologies applied in the energy sector ease mobility and decrease transport costs. The development of power cables, superconductors, quantum conductors of new nano-materials rewire electricity grid and enable long-distance, continental and even international electrical energy transport. The reduction of weight and volume also reduces transport costs. Although new technologies are further transforming life and production in Europe, only a modest number of them are generated in Europe which remains dependent upon discoveries, patents and licensing from other continents. The technological gap with the USA, Japan and, increasingly, other Asian countries, remains.

Considering the cumulative growth of GDP between 2002 and 2015 (Figure 17)[22], the catching up process of the East-European economies is obvious with regional growth rates largely higher than in West-European regions (showing a clear eastwards shift of the European epicentre of growth). Growth is particularly significant in the Baltic States, Poland, eastern Slovakia, western regions of Romania and Bulgaria, and Cyprus in the eastern Mediterranean. In Western Europe, the development pattern is more diversified. One can observe a greater performance in the eastern border regions in Western European (EU-15) countries, from Denmark to Germany and Austria, accompanied by a general slow-down in the growth of more peripheral countries and southern regions. While most regions of the pentagon show sustained, but not outstanding economic development, especially those with large metropolitan areas, such as London, Paris, Milan, Hamburg, Frankfurt, Düsseldorf, Stuttgart and Munich (exceptions are eastern France and some German regions), a number of regions surrounding the pentagon perform less favourably, such as those of central and western France, the "Third Italy", but others show stronger economic performances than most regions in the pentagon: the French southern belt, all Danish regions and a cluster with particularly strong growth along the Brenner axis, encompassing the Munich

[22] Figure 17 is derived from the mapping of projections of the MASST model through the application of smoothing techniques

metropolitan region, western Austria and the eastern Alps in Italy. In the western periphery, higher or medium growth rates are observed in regions with metropolitan areas like the Dublin region, central Scotland, metropolitan regions of Lisbon, Madrid, Rome Naples, Athens, Stockholm and southern Finland. They are also observed in some less urbanised regions such as southern Ireland, Northern Ireland, Wales and south-west Sweden), and in tourist islands like the Balearic Islands, Rhodes and Crete. Large parts of the western periphery show however weak economic performances: most regions of the Iberian Peninsula, the Nordic countries, southern Italy and Greece.

Winner regions[23], improving their relative position in 2015, are mostly present in eastern member states. Within these member states, the most successful areas are the agglomerated regions, namely capital regions and large city regions. A different picture is presented in Western Europe. In this part of Europe, in general regions lose their relative position with respect to the EU average: the loss is higher in rural areas like the central part of France and most of Spain, of Portugal, and of Greece). It is, however, more contained in agglomerated and mega regions like the pentagon area, southern England, the Greater Dublin Area of Ireland, most Italian and Greek regions, Catalonia, Madrid and Valencia in Spain and Lisbon and Porto (Norte) in Portugal.

Smoothed maps based on MASST results: cumulative growth (left) and change in relative position (right) - 2002-2015

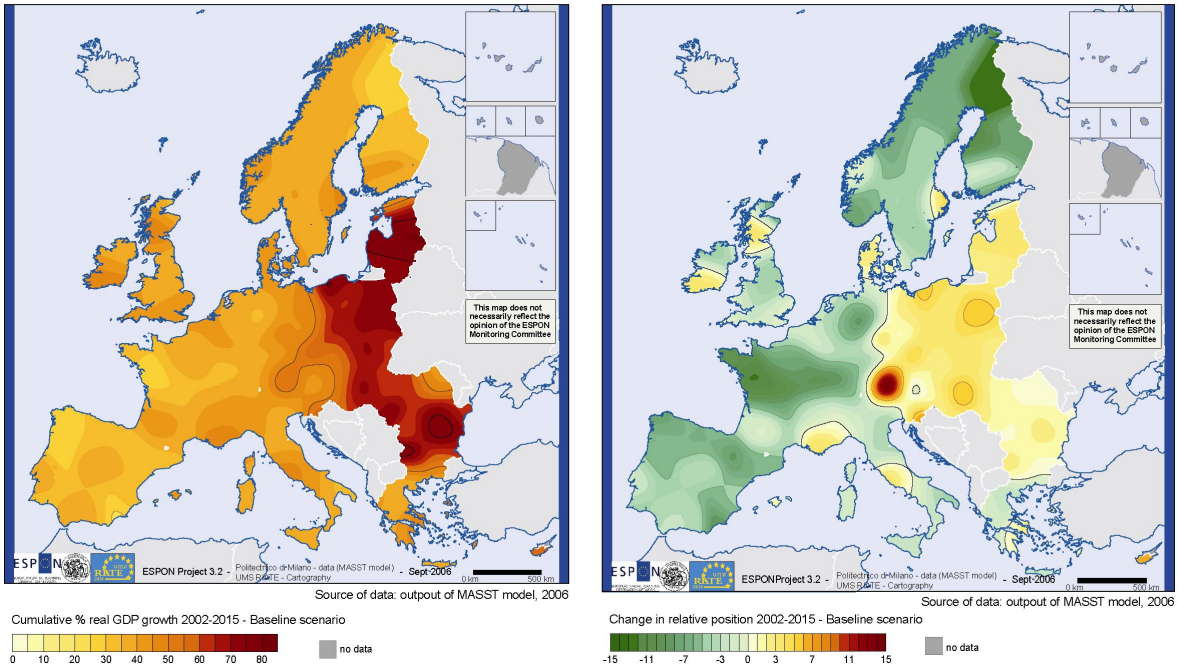


Figure 17 Smoothed maps based on MASST results: cumulative growth (left) and change in relative position (right) - 2002-2015

In the new member states and in Spain, East Germany and southern Italy, unemployment remains substantially higher than in the core areas of the EU. In the new member states, Structural Funds are being spent mostly on infrastructure, transport and environmental improvements. This does not raise employment substantially. In addition, in some

[23] Defined on the basis of the change in the relative position (with respect to the EU 27 mean) in per capita GDP level between 2002 and 2015.

countries such as the Baltic States, Poland, Romania, and Bulgaria – agriculture sets a large number of people free.

After 2015, the pattern of growth accentuates the contrast between metropolitan and non-metropolitan areas, both in Western and Eastern Europe, although the development of major transport infrastructure in eastern Europe is likely to favour a less concentrated growth pattern. This process of differentiation was also observed up to 2015 within the pentagon, the growth of which was not homogenous. Stronger differentiation can also be observed after 2015 within and between rural areas. Some become rather wealthy on the basis of residential and tourist functions, especially related to the attraction of retired people, or of intensive agricultural production. Others become subject to depopulation and marginalisation. The result of the CAP reform[24] – coupled with changes in product prices in the global market that favours bulk production in of cereals and sugar in Brazil, meat in Argentina and Australia, etc. – is that European agriculture follows a triple tendency: bulk production, niche-market development for high value products (taking advantage of high-productivity know-how, such as is required for organic farming) and extensive management of semi-natural areas (principally through grazing). Intensification and scaling-up of agricultural production in fertile areas are stimulated by the further liberalisation of agricultural production and the progressive reduction of the CAP budget. On the other hand, 'experience farming' increases in rural areas located in urbanized regions and in rural areas with small-scale landscapes in the Pentagon and in Eastern and Southern Europe. Consumers are willing to pay a higher share of their income for organic, regional and other quality products. In an increasing number of rural areas, where the demographic situation (ageing population), production conditions (poor soil fertility/increasing drought) and the appeal of the natural landscape are unfavourable, marginalisation and abandonment progress. This type of evolution is to be found both in Western and Eastern Europe.

Territorial integration has progressed up to 2030. The continuing European support for the border regions has contributed much to the positive changes along the internal borders. Beneficiaries are primarily the better-off border regions which have long since practised co-operation. Internal border-regions where prospering development cores with a diversified business landscape existed at the beginning of the 21st century, emerge as "integration zones", i.e. spaces of intensive inter-firm co-operation (e. g. the Saar-Lor-Lux-Region, the Upper Rhine Region, the Country-Triangle CZ-PL-D (Euroregion Neiße). However, in border regions, where endowment with factors of economic growth is rather poor, the quality and intensity of inter-firm cross-border co-operation remains low, even if inter-municipal co-operation is evolving relatively successfully. Contrary to the internal borders, the quality and intensity of cross-border co-operation along external borders is still significantly lower, since strict border-control-procedures set limitations for cross-border mobility. Furthermore, deficits in terms of infrastructure (both border crossing infrastructure and accessibility of the hinterland) set limitations to the evolution of "co-operation spaces". Whereas many internal border regions tend to become spaces of integration and co-operation, the majority of regions along external borders remain "spaces of division". The most problematic regions remain the border areas between Poland and Belarus, Poland and Ukraine, Hungary and Ukraine, Slovakia and Ukraine, and (after 2008) Romania and both Moldova and Ukraine. Summing up; the "battle" for scarce EU funding which had already emerged in 2000, now results in a situation where neither sufficient progress regarding the global competitiveness of Europe, nor a sufficient degree of territorial cohesion can be reached before 2030.

[24] Scenar 2020 p 48-50 Scenario study on agriculture and the rural world. European Centre for Nature conservation et alia. First interim report March 2006. European Commission

Transport and accessibility

The transport situation is conditioned by the general economic conditions of modest economic growth in Europe. Transport flows however continue to grow under the influence of progressing European integration and of accelerating globalisation. In addition, the nature and geographical distribution of flows is changing under the influence of structural evolutions in the economy (a progressive move towards a more intangible economy with less heavy industry and more high-tech productions and high-level services) and of EU enlargements. The sustainable character of increasing energy prices (in particular of oil) is a major constraint in the transport sector, both for goods and people's transport. The new energy paradigm also has significant impacts on mobility and on technological development. From 2004 onwards, the behaviour of European citizens regarding mobility has been progressively changing with a new trend of car sharing, the search for residential locations closer to cities and other working areas, more intensive use of public transport and the substitution of physical mobility through the use of ICT services. Population ageing and the increasing number of retirees generate new forms of mobility, very different from the classical home-work relations, more linked to recreation, cultural activities, travelling, health care etc. The territorial differentiation of demographic structure (younger generations in metropolitan areas and more retirees in rural areas) is accompanied by a corresponding territorial differentiation of mobility patterns. Technological evolution plays an important part in the evolution of transport systems in Europe. The network of high-speed trains expands within the pentagon and also in the direction of more peripheral countries (Iberian Peninsula, countries of Central and Eastern Europe). New engine technologies are being developed (hybrid cars, fuel cell engines) which become rapidly popular despite somewhat higher investment costs in the short term. In addition to lower energy consumption, the popularity of these new car generations is also justified by their lower environmental impact. Another sector of technological evolution in transportation is the generalisation of Intelligent Transport Systems, combining information and transport flows.

Transport policies in the baseline scenario are somewhat contradictory. A number of measures are being implemented which contribute to alleviating the environmental footprint of transportation, such as road pricing (aiming at a better balance of transport modes), the development of less polluting engines, the promotion of public transport etc. On the other hand, the low economic performance of Europe in the early 2000s and the acceleration of the globalisation process lead a number of countries to adopt a much more liberal market-oriented approach, with a revival of motorway programmes and the abolition of restrictive measures to road transport. At EU level, the ERDF and the Cohesion Fund support significantly the development of transport infrastructure in the less developed countries and regions, especially in the new member countries. Main trunk connections between metropolitan areas and between Western and Eastern Europe have highest priority, at the expense of more local connections. In Central and Eastern Europe, transport systems are evolving to the advantage of roads and motorways. More and more public-private partnerships are developed to provide the necessary financial resources. The privatisation of networks is also progressing. Liberalisation is progressing in the railway sector, to reach finally passengers' transportation and urban public transport.

The pattern of accessibility evolution between 2000 and 2030 (Map...) is a concentric one. The area of high accessibility broadly covering the pentagon is widening in almost all directions, while the accessibility handicap in most peripheral regions is being attenuated. In some peripheral regions, however, such as Northern Ireland, northern Scotland and Greece etc., the level of accessibility does not really improve. By 2030, disparities in accessibility between centre and peripheries remain significant.

Energy

The sudden increase of oil (and gas) prices after 2003 generates a variety of changes in the complexity of energy systems and in attitudes towards energy production and consumption which can be considered as the emergence of a new energy paradigm. Already by 2005, and increasingly in subsequent years, a number of significant changes can be observed in various fields related to energy consumption. Numerous industries in East and West invest in energy saving techniques and technologies. Households invest in house insulation and in complementary renewable energy sources. People contain their mobility, develop car-sharing and make more frequent use of public transport services, in particular in home-work relations. Some energy-intensive industries (for instance those producing aluminum or steel) are relocated outside Europe because of heightened energy prices. The third oil shock is further boosting the process of diversification of energy supply systems from 2004 onwards.

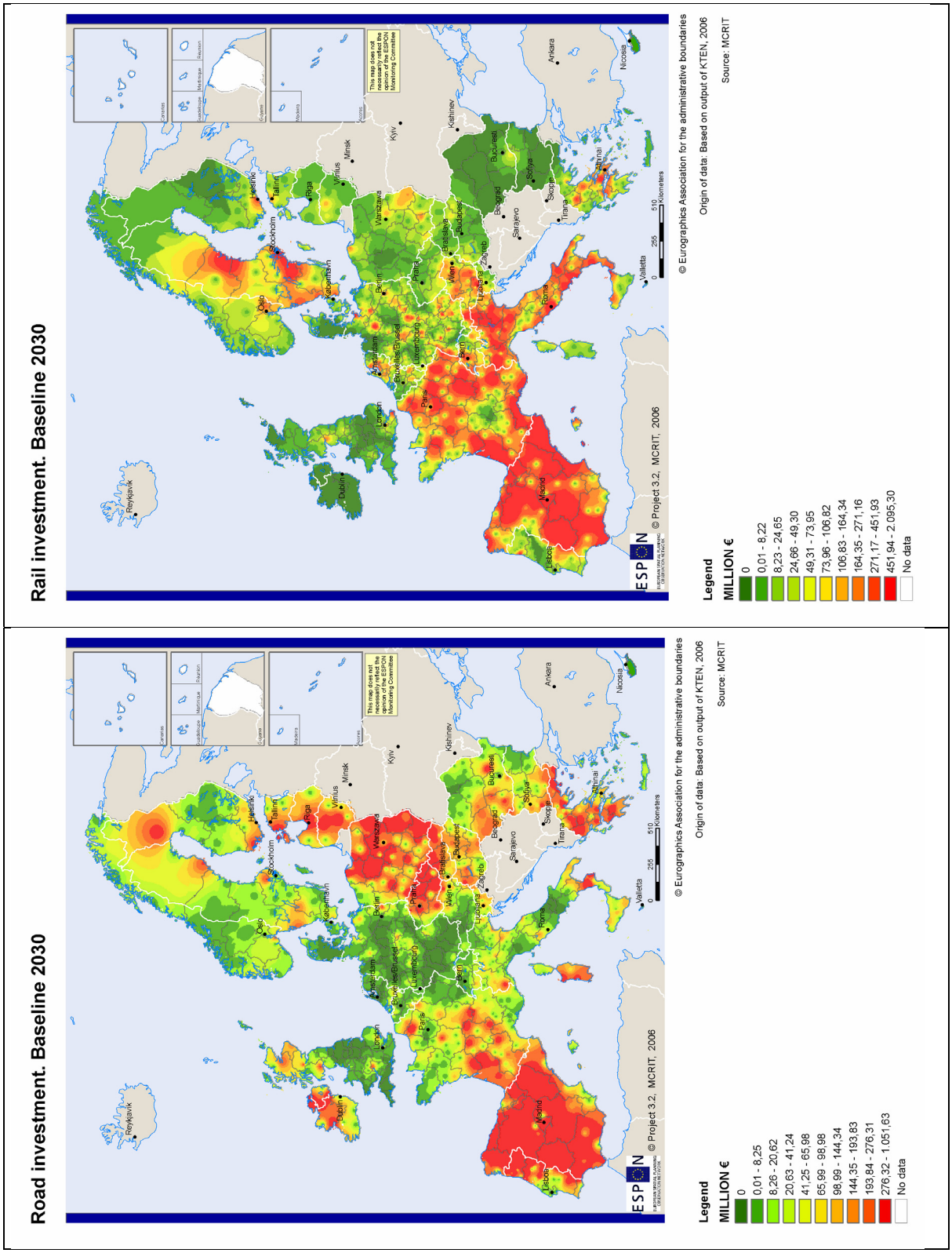


Figure 18 Road and rail investments until 2030 (KTEN Model)

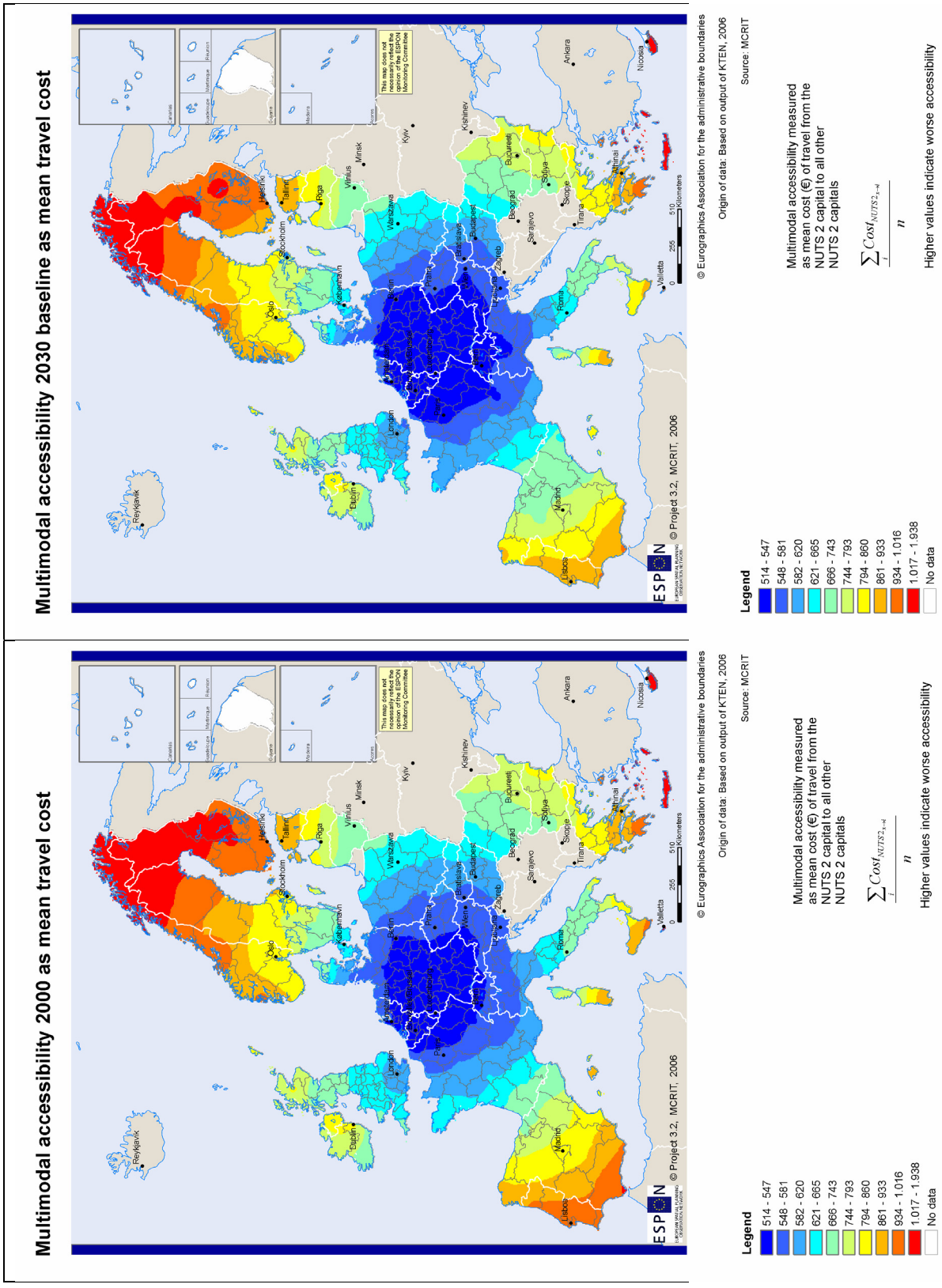


Figure 19 Multimodal accessibility 2000 and 2030 as mean travel cost (KTEN Model)

The main beneficiaries of this diversification process are the renewable energy sources (solar, wind, biomass and bio-fuels, geothermal energy, wave and tide hydro-power etc.). Their development is progressing rather significantly throughout Europe. Not only do the advanced economies of Northern Europe engage in the exploitation of renewable energy sources, but also various other peripheral countries and regions of southern Europe, such as Portugal or Greece. A significant revival of nuclear electricity production can be observed in numerous European countries thanks to new generations of nuclear power plants and to the pressure of certain lobbies (France, Italy, Slovakia, UK). Experimental projects are also carried out in the field of coal gasification and liquefaction, but the cost of such processes remains an obstacle for a long time. The production of hydrogen as an energy driver also looks promising for the future, but the cost of primary energy (natural gas, electricity) needed to produce hydrogen is a significant handicap to mass production. Nuclear fusion remains a potentiality for the very long-term, with the "Iter" project being implemented as a unique pilot project in this field. In addition to the diversification of energy sources, new technologies are developed on the basis of conventional fossil energy supply, such as hybrid cars with both conventional and electric engines. Hybrid heating systems of houses using solar energy and fuel or natural gas become rather widespread and also contribute to the reduction of air pollution in towns and cities.

Increasing energy prices add their impacts to the factors causing low rates of economic growth in Europe because of the high and increasing external energy dependency of Europe. While energy-intensive production sectors have progressively been abandoned, the immaterial economy has strongly progressed and Europe has become the world leader in technologies related to renewable energy and to new energy systems, favouring the technologically advanced regions of the Pentagon. Increasing energy prices thus affect more strongly the countries and regions with traditional industries, both in Western and Eastern Europe. At European-wide scale, peripheral regions whose economies are more dependent upon transport, are losing a part of their competitiveness because no major substitution possibilities to road and air transportation are possible. This trend works against polycentricity at the global European level. The availability of renewable energy resources (such as climatic factors in the case of solar energy or biomass) is not by itself a factor of economic or demographic distinction, but in combination with other factors (economic endowment, quality of life, accessibility etc.), it certainly is. Migration flows towards regions with attractive climatic conditions or the development of tourist activities in these regions are bringing with them wealth and jobs.

Rural areas are significantly affected by the new energy paradigm, both in positive and negative terms. As a consequence of high-energy input; agricultural production methods (for heating, treating and fertilizing), increasing energy prices lead to higher consumer prices for food produced in the EU. This in turn results in less competitiveness compared to farm products from outside the EU, where less energy is used in the production process. Higher transportation costs from and into rural areas disadvantage agricultural production in the most remote areas, as farmers from these areas are less competitive than farmers on the perimeters of urban areas. On the other hand, high potentials exist for the production of bio-fuels. The production of energy crops progressively brings new sources of income to farmers, alleviating somewhat the problems of agriculture in peripheral rural regions. Set aside land is being reconverted into energy production. Southern regions are however less favoured in this respect because of increasing drought. Wind and solar energy are also of importance for numerous rural regions.

A move away from suburbanisation and towards more compact cities is taking place, although it is still counteracted by increasing prices for dwellings and houses in cities.

Settlement systems are increasingly coupled with public transportation. Urban and housing policies are favouring more energy-efficient types of settlements and buildings, making possible additional energy savings and greater use of renewables. Home working is strongly developing, as well as other types of ICT applications such as the access to public and private services, e-shopping, educational and cultural programmes etc. The progressive change of the energy paradigm brings with it both positive and negative aspects concerning the quality of the environment. Various factors contribute to improving the environment: lower consumption of oil and gas, use of renewable energy sources, development of hydrogen technology, emergence of new transport technologies (hybrid cars) etc. Other factors have detrimental impacts on the environment, such as the resurgence of intensive agriculture (energy crops), the negative impacts of wind energy on landscapes and tourist frequentation and the revival of coal and nuclear power plants. Climate change has various impacts on the energy sector. First, it changes the pattern of energy consumption, mainly territorially. Global warming reduces the need for heating during spring and autumn in numerous European regions, but it increases the need for air conditioning, in particular in Southern Europe. The impact of climate change on energy production is also significant, mainly in southern European regions. Regions prone to drought have to face a double constraint: rainfalls are not sufficient any more to provide enough water to hydro-power plants and to enable the production of energy crops in agriculture. Drought favours forest fires and reduces the availability of wood and biomass to be used as energy sources.

Environment and natural resources

As far as water resources are concerned, water shortage is an increasing problem in Southern Europe because of alarming drought trends calling for a number of new strategies. This forces politicians and business to take decisions on water prices and investments in alternative ways to deliver water (desalination, water transfers from other basins, etc.). Irrigation techniques become slightly more efficient, due to water pricing and increasing risks of an insufficient availability of water. The most water-consuming crops (e.g. corn) progressively disappear. Lack of water increases the risks of forest fires and makes landscape management in semi-abandoned areas more difficult. As far as water quality is concerned, pollution levels of European rivers have generally decreased by 2030, particularly in industrial zones and urban fields. But ground water quality is deteriorating in most areas with intensive agriculture, leading to high costs for drinking water production. In Western Europe, the most affected areas are the Paris Basin, the Benelux regions, northern Italy and northern Germany. In the fertile areas of the EU-10, the use of fertilizers rapidly catches up with western levels. Increasing heavy rainfalls in Northern and Central Europe, but also in Southern Europe, where they may reach extreme intensity, cause more damaging river floods and hazards, which are only partly attenuated by spatial prevention measures, like the reservation of water retention areas. Resources affected to prevention measures are insufficient because they require significant investments often considered as non-productive.

Continued road traffic growth, despite higher energy prices, driven by economic development and infrastructure investments means more potential emissions. Technological evolution and more severe legislations make it possible however to contain and even reduce, to a certain extent, air pollution. Environmental legislation fosters technological developments and accelerates the implementation of certain existing technologies (carbon black filters). Other technologies (hybrid cars, fuel cells engines) lead to lower air pollution levels, in particular in urban areas. Air quality improves more rapidly in Western Europe than in Eastern Europe, mainly because new technologies are more rapidly adopted. In addition, the move towards the service economy is stronger, which leads to a reduction of the environmental footprint of manufacturing industries. The health situation has nevertheless been improving in most European cities and territories. In spite of this, hot spots of high traffic volumes remain with high concentrations of small particulates.

The evolution of natural areas and biodiversity is subject to contradictory evolutions. The Natura 2000 sites are sufficiently protected, but connectivity between different protected areas, as foreseen by the Directive, are not fully reached. Urban sprawl and fragmentation of natural areas take place in and between growth regions, particularly in the pentagon area and in economically well performing metropolitan areas in Central and Southern Europe. Under the pressure of infrastructure, tourism and second homes, many coastal areas are further developed at the expense of valuable natural landscapes and wetlands. Pressure on accessible, attractive mountain areas rises. Overall, biodiversity decline has been only curbed, up to 2030, but not stopped, due to remaining lack of connectivity between protected areas, and a continuing pressure on natural areas. Widespread energy crops production introduces monotonous landscapes potentially causing a further decline of biodiversity. Emigration from areas unprofitable for agriculture, takes place particularly in Southern Europe, and leads to the abandonment of low-intensity farming systems. This causes the invasion by a limited number of species, forest fires and further desertification. Shifting climate zones urge species to move northward or to higher altitudes. Many natural areas in the new Member States are changed into farmland. In the open fields in the polders and deltas where agriculture increasingly industrialises, many elements of the natural landscape are removed. Many small-scale landscapes are changed into open fields. The environment is affected by the increased use of chemicals and irrigation. This is compensated, to some extent, by nature development and forestation programmes.

The impacts of climate change have been becoming significant up to 2030, as in the increased occurrence of natural hazards (floods, droughts and heat waves) and shifting climate zones. Floods have caused much damage, more so in countries which had not invested in preventive measures. Drought leads to the abandonment of dry-land agriculture in Southern Europe. Desertification increases and biodiversity declines. Inter-regional tensions for the appropriation of water resources are emerging. In northern European regions, on the contrary, more favorable situations appear. In Finland, positive effects of climate change are observed in agriculture, forestry and in energy consumption. Climate change is therefore recognized as a major problem, but measures to adapt to its consequences are principally taken at national level. As a result, large differences develop between countries. Germany invests heavily in flood prevention, whereas Eastern Europe hardly does so. Ambiguity is reigning between severe and costly adaptation measures and a focus on most cost-efficient measures.

3.4 Territorial image of Europe by 2030

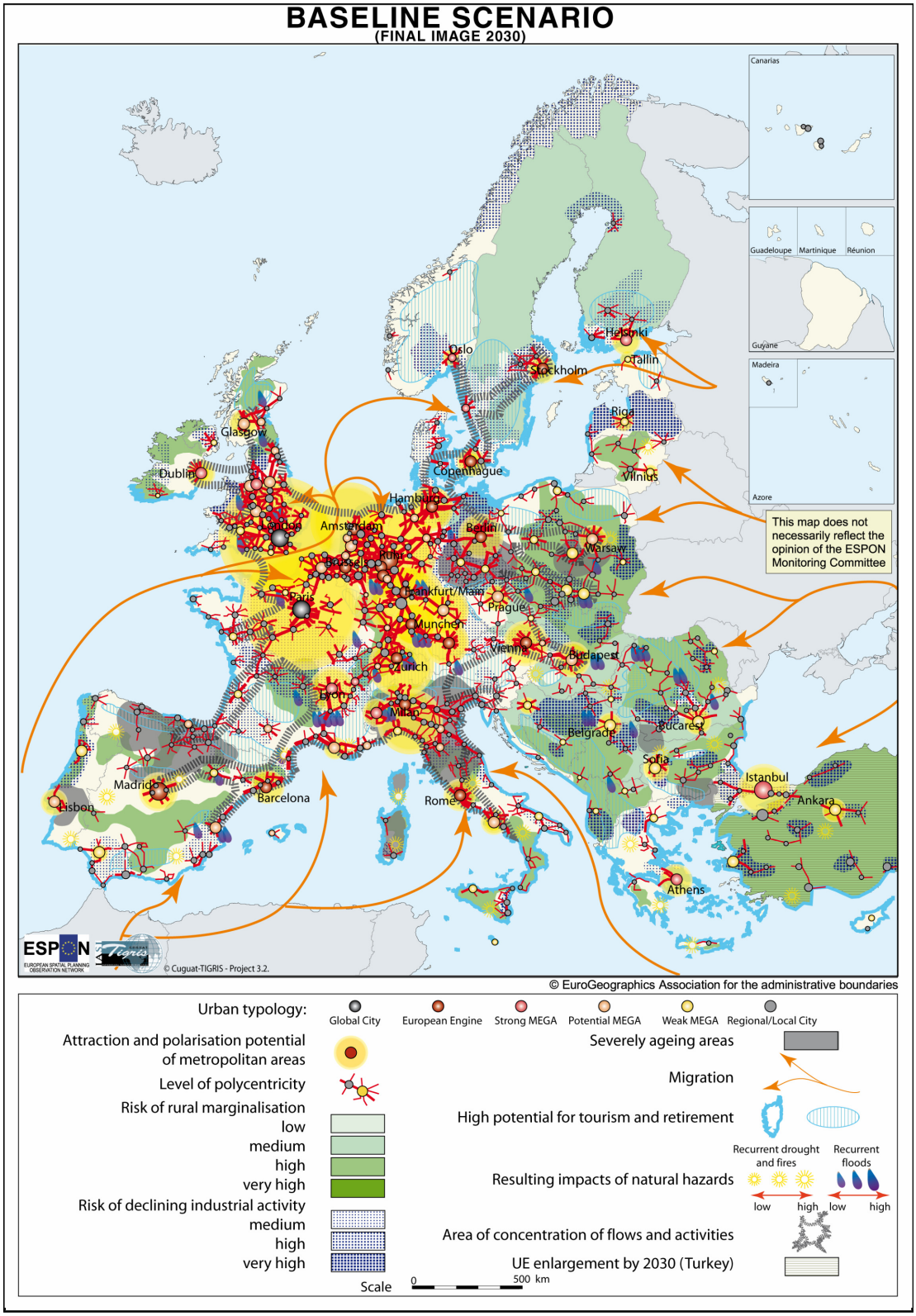


Figure 20 Schematic map of the final 2030 image of the baseline scenario

The map illustrates the ***attraction and polarisation of metropolitan areas*** in 2030. From this figure, we can see a remarkable concentration of strong metropolitan areas in the former pentagon, but also in less central regions (mainly capital cities and other European engines). The former pentagon of the early 2000s, grouping the ***areas of concentration of flows and activities*** has expanded, mainly along the main transport corridors, in the direction of important MEGAS like Barcelona and Madrid, Rome, Glasgow, Copenhagen, Stockholm and Oslo, Berlin and Warsaw, Prague, Vienna and Budapest. The basic characteristics of settlement systems in terms of ***polycentricity*** have not fundamentally changed. Various types of areas have run significant risks of economic decline in relation with progressing globalisation and European integration. The trend towards ***marginalisation of various rural areas***, already observed in the early 2000s, has generally continued, but with regional variation. In some areas, the number of available jobs declined significantly. In others, population ageing and even depopulation reached a critical level. Accelerating globalisation has affected a significant number of industrial regions with low or intermediate technologies, exposing **the *risk of declining activities***. The most severely affected areas lie in central and eastern Europe**.** ***External immigration*** (legal and illegal) has continued, with immigrants settling mainly in metropolitan areas, including central and eastern European cities. The ***areas with a high potential for tourism and retirement*** have specific geographical attributes (coastal, lake and mountain regions), while other ***ageing areas*** are mainly found in remote rural regions without specific attractiveness. Various regions are subject to the ***impacts of natural hazards of various nature***. The least affected regions lie in northern Europe.

In a baseline perspective, the characteristics of the European territory in 2030 reflect a number of important changes, compared with the situation in 2005. By 2030, the European population is, in average, much older than in 2005, with strong variations however, from region to region. The total population has declined, despite the existence of new growth impetus of fertility rates in a number of countries after 2000. Areas with a particularly old population (average age above 50 years) are East-Germany, northern Italy and Sardinia, Corsica, north-west Spain, Scotland, northern Sweden and central Greece. In the countries of Central and Eastern Europe, population ageing is counteracted by low life expectancy, despite very low fertility rates, both factors generating population decline. In regions with very old population structures, a number of related impacts can be observed, such as a weakness of labour markets which reduces the propensity of enterprises to invest and to create jobs, the slowing down of internal demand and the reduction of services of general interest caused by progressive population decline.

The result of three decades of moderate economic growth and of insufficient competitiveness in Europe in a context of accelerating globalisation is that a number of large European companies have been taken over by foreign multinationals from North America, Japan and emerging economies (Asia, Brazil). Strong restructuring and rationalisation has taken place in the related European branches. Europe is leader in a few sectors, such as aeronautics, some new energy technologies and specific sectors of biotechnologies. Especially in the capital-intensive sectors of biotechnologies, energy and transport (particularly railways) a strong concentration of enterprises has taken place. A number of successful privatised ports were taken over by foreign companies, especially from the Middle-East. A few large energy companies control the production and distribution of electricity, the sectors of renewables (in particular the production and transformation of energy crops, the wind energy parks), the development, renewal, operation and

maintenance of nuclear power plants, the distribution of natural gas, the coal gasification plants and the production and distribution of hydrogen. Service industries and advanced tertiary activities are much more developed than they were in the early 2000s, as are household related services. Conversely, numerous industrial activities with low and medium technological level have disappeared from Europe, even from the countries of Central and Eastern Europe, for reasons of insufficient competitiveness. The same has happened to energy-intensive industrial activities, especially metal production, petrochemical and basic chemical activities. These trends, accompanied by asymmetric shocks, have led to strong territorial differentiation and specialisation.

Considering the long-range economic trajectories of regions, the European territory of 2030 shows that sustained growth processes are specific to a few categories of areas, in particular those characterised by high-level metropolitan or gateway functions, those attractive for specific population groups such as retirees, tourists etc. or those with new, significant economic activities such as in the field of new energy technologies and renewable energy supply (production of bio-fuels in particular). The catching-up processes characterising less developed countries during the years following their accession to the EU, by contrast, is valid only for the short and medium term (generally not more than 15 years). After that, significant processes of territorial differentiation take place, based more or less on the same principles as those prevailing in the more central areas, with on the one hand, metropolitan regions continuing above-average development and, on the other hand, rural and intermediate regions lagging behind in their development pace, if they don't have specific advantages of attractiveness. By 2030, these types of long-range economic trajectories appear to be valid not only for the new member countries of Central and Eastern Europe, but also for a quite number of regions in the EU-15, in particular the peripheral ones.

Urban Europe

In a world-wide perspective, European global cities have become more competitive, compared to the early 2000s, but their distance from the global cities of North America and Asia has not changed. At Europe-wide scale, the metropolitan areas of the pentagon, together with a few others, have strengthened their leading European position. The pentagon, as defined in the late 1990s, has been expanding along major corridors with significant metropolitan areas, towards the British Midlands, the southern parts of the Nordic Countries, the Rhone Valley and the Danube Valley up to Budapest. The network of high-speed trains interconnects most of the metropolitan areas of the wider pentagon. A number of networks of cities have been emerging inside and outside the pentagon, supported by efficient co-operation in RDT. The consolidation of these networks has led to the development of wider areas, especially the Baltic Sea Region and the new "Triangle" of Central and Eastern Europe, formed by Vienna, Warsaw and Budapest, including Prague, Dresden and Bratislava. The development of polycentricity takes place through the expansion of the pentagon rather than through the development of alternative global economic integration areas.

Remote peripheral regions, and even those with large cities, have generally not been successful in generating or maintaining sustained development processes, so that no global economic development area emerged outside the wider pentagon. As a result, large cities in the peripheries remained rather isolated in their development process and have not significantly benefited from network and synergy effects.

At intermediate scale, the level of polycentricity in the national urban systems of the countries of Central and Eastern Europe and of the southern peripheries has been reduced, compared with that of the early 2000s. This is a result of territorial differentiation in the long-range economic trajectories of regions. In the countries of Central and Eastern Europe,

rural-urban migrations have been significant up to 2030, precisely because of the process of territorial differentiation. Nevertheless, a substantial part of the rural population has been urbanised in situ, i.e. without long-distance migration. Migration flows have also developed from small to larger urban centres. In Western Europe, both urban-rural migrations (retirees, self-employed etc.) and rural-urban migrations (young employed, students) have been co-existing during the three decades since the early 2000s, so that the demographic structure of large cities is generally much younger than that of numerous rural areas. A territorial division of generations has progressively taken place. In a significant number of regions with traditional industries, both in Eastern and Western Europe, the large, medium-sized and small towns have been declining in the context of accelerating globalisation and are facing, by 2030, serious difficulties in their attempts to recover and generate new activities. In the wider Europe, a number of regions attractive for residential and tourist functions have developed however, some of them strongly, even in the absence of significant cities. ICTs have contributed to such processes.

Important differences with the urban systems of the early 2000s can however be identified at the local/regional level. A number of factors with cumulative impacts have contributed to reshaping urban settlements, the two major ones being increasing insecurity in cities and increasing energy prices. Insufficient economic, social, educational and cultural integration of ethnic minorities (mainly young people from immigrant families) has strengthened social and physical segregation in cities and favoured sporadic troubles and even riots. The social housing estates where these people live, as well as their surroundings, have been left by the population of European origin and by the 'better-offs' among members of immigrants families, who moved to more "secure" and quiet areas, either in other parts of the agglomerations or into smaller settlements of the surrounding rural areas. In many cities as well as in tourist resorts, gated communities have emerged. Electronic security facilities are omnipresent in cities and in public transport. This type of evolution is stronger in the metropolitan areas of the pentagon and Mediterranean regions. As immigration has also significantly increased in the countries of Central and Eastern Europe; urban social and physical divides have been growing there also.

The impact of growing energy prices on settlements has been rather different to that on issues of integration. High oil prices have favoured compact cities, with lower volumes of commuting movements, higher use of public transport systems and better integration of urban functions. Recreation and leisure facilities were developed in the proximity of agglomerations. Densification and new urban developments took place in the surroundings of the stations of public transport networks. Home working has significantly progressed, so that numerous active people do not need daily commuting into cities and prefer residential locations in surrounding rural areas, in particular those well connected by public transport. The urban pattern at regional and local level is one of increased social/physical segregation combined with compact approaches to new developments and redevelopment. It is however clear that this global pattern is largely differentiated according to the types of regions. It takes different shapes in booming metropolitan areas and in declining industrial medium-sized cities.

The environmental quality of urban areas has progressed as far as air quality and noise levels are concerned, mainly through the widespread adoption of new car engines (hybrid cars, fuel cells engines). Social tensions and physical segregation has however led to the expansion of areas with a degraded environment and derelict character. The quality of the living environment in cities is more and more subject to a dual process with, on the one hand, areas of improving environment and gentrification and populous areas with poor living environments on the other.

Rural Europe

During the three decades following the year 2000, European rural areas were subject to strong dynamics. The diversification process already initiated in the 1990s in Western Europe continued and was also extended to Central and Eastern Europe. The new member countries benefited from the CAP support, the CAP itself being subject to some subsequent reforms, including the implementation of WTO decisions. The strong development of the production of biomass and energy crops gave new impetus to rural areas, including less fertile ones. Finally, the acceleration of climate change proved to be rather detrimental to rural areas in the southern half of Europe, while it was beneficial in the northern half.

By 2030, rural areas and landscapes in Europe are much more diversified than they were in the early 2000s, despite a strong trend towards dualisation in the agricultural sector. Some have substantial population density in relation with their proximity to large towns and metropolitan areas and to their attractiveness for residential and tourist functions. These are spread throughout East and West in the surroundings of large cities, in coastal areas, in attractive valleys of mountain regions and in a number of Mediterranean regions with a favourable climate. The degree of economic diversification of these rural areas is rather high. At the other extreme, a significant number of remote rural areas are more or less abandoned, particularly rural areas strongly affected by out-migration and population ageing and rural areas less attractive for residential or tourist functions. Various types of intermediate situations can be observed, with some rural regions taking advantage of EU support (CAP and RDP) for stabilising their economic performance over the long-term, while others with smaller production structures and declining industrial activities are engaging into a downwards spiral. Numerous rural regions of Central and Eastern Europe, with the exception of those surroundings large towns, have lost population after their accession to the EU, despite substantial support to agriculture.

Up to 2030, numerous changes have taken place in agricultural systems, both in Eastern and Western Europe. A dual system of agricultural economy has been consolidated, boosted by further liberalisation of agricultural exchanges and by European integration:

- in large, fertile areas and/or close to the main consumption centres (agglomerations, tourist areas), large-scale, highly mechanised agriculture has developed, employing very few people. Large farms dominated already in the early 2000s in the UK, in the Czech Republic, in Slovakia, in East-Germany, in north-west Poland and in a few regions in France. After 2010, a rapid concentration took place in Hungary, Romania and Bulgaria. These large and cheap agricultural areas attracted numerous farmers from Western Europe (Netherlands, Germany, Austria, Denmark, Sweden) to buy or rent land and to set up large farms. Large farms have successfully resisted the pressure of global competition and dominate in the production of agricultural products; a significant proportion of them develop export-oriented productions. In such areas, large energy companies have bought large agricultural estates to produce energy crops;

- in less fertile or less favourably located areas, especially those dominated by small farms, a more diversified evolution has taken place. The most successful of these regions could change the profile of their activity (rural tourism, traditional handicrafts, organic farming) or strengthen some specificities ("terroir" products, regional brands). CAP subsidies (direct payments to farmers) as well as the production of energy crops at smaller scale, also contributed to stabilise the economic performance of such regions. In less favourable areas, numerous farms have been abandoned, being pushed out of agricultural production by competition. Many areas of this type are to be found in the European peripheries, but also in some more central regions.

The impacts of climate change have been detrimental to numerous rural regions in the southern half of Europe. Drought has severely reduced agricultural production and has even led to the abandonment of agricultural activities in areas where irrigation was no longer possible and where alternative agricultural productions could not be successfully envisaged. Forest fires have generalised and permanently destroyed traditional landscapes, adding to the drought problems, because of the reduction of the humidity retention capacity of soil in mountain areas. Indirect negative impacts have taken place on rural and coastal tourism and on hydro-power production. As a counterpart, rural areas in the northern half of Europe have benefited from this evolution. Demand for specific agricultural productions has increased, as well as for rural tourism. A new impetus of growth benefited especially rural regions in the northern parts of Central and Eastern Europe (Poland, Baltic States, Czech Republic, Slovakia and East-Germany).

The rural environment has been subject to contradictory evolutions. The generalisation of EU environmental legislation throughout the wider Europe has brought with it positive impacts for the protection of nature and surface water, while the intensification of agriculture in the most fertile areas and the acceleration of climate change were detrimental to ground water quality and resources, to traditional cultural landscapes and to soil protection.

3.5 Territorial images by 2030 in the European macro-regions

Atlantic Area

The total population of the Atlantic Area rose slowly over the first three decades of the 21st century, but as a result of migration into the region rather than natural growth. Concentrations of population and their age profiles continued to develop unevenly. Generally speaking two inter-dependent trends were evident in the period up to 2015. Firstly, there was an inexorable growth of the main metropolises of Lisbon, Dublin, Manchester-Liverpool, Birmingham, Nantes and Bilbao, fed by a persistent inflow of - primarily young - people from within the region, outside it and from other parts of the EU. Secondly, the consequently intensified concentration and congestion contributed to pre-existent 'counter-urbanisation' trends, as 'those that could' moved their families and main residences away from built-up urban centres. Intra-regional EU migration and the persistent popularity of 'early retirement' among the growing middle classes strengthened the second migration pattern. This has reinforced a glove-like sprawl settlement formation – spreading outwards from established centres towards selected rural and coastal fringe areas.

The EU enlargement of 2008 had a substantial impact on the many Atlantic regions, as did that of 2004. Again the effects have been two-fold; initially boosting areas which had been suffering from population decline, but later further disadvantaging the most remote western areas whose geographical peripherality became more disadvantageous as eastern parts of the EU became more competitive. Most of the immediate demographic impacts were felt prior to 2015, largely as a result of earlier restrictions under the 'transitional rules' in France and Germany on migration from the accession countries. Ireland, the UK, Spain and Portugal thus became the favoured destinations of working migrants from Eastern Europe, in cases breathing new life into towns and villages which had been shedding populations. Nevertheless, despite the partial revival of some peripheral areas previously threatened with de-population, (such as the South-West of England, Scotland and Ireland) the out-migration flows from the extremities of the Atlantic Area, to the European core continued. Between 2015 and 2030, after restrictions to the free movement of workers within the EU were removed, the feared shift of the centre of gravity eastwards began to take its toll, with the popularity of some medium sized towns in the Atlantic Area proving short-lived, or at least

seasonally limited. Consequently the existent insecurity in the labour market was accentuated, communities become typically more transient and tensions between young people over limited resources inevitably arose and resulted in sporadic unrest.

The farming and fishing sectors, upon which much of the area was traditionally dependent, which had been hit heavily by the effects of de-population for decades, were still vulnerable in the first three decades of the 21st century with younger people still subject to the constant pull of the ever expanding conurbations. Further problems have arisen in both sectors due to the environmental effects of climate change. In addition, small farmers and fishermen have struggled to retain their competitiveness with cheap food imports and the greater productivity of large intensive, mechanised farms. Ironically, whilst some of these imports have come from within the EU, specifically from the new Central and East European member states, in all countries of the Atlantic Area migrant labour from Bulgaria, Romania (as well as, more controversially, from outside the EU) have been key to retaining agricultural productivity and viability, as have a growth in the popularity of local produce in some cases. However, between 2015 and 2030 intense environmental problems, such as increased precipitation levels[25] in Ireland, France and the UK and chronic losses of natural fish stocks along the entire Atlantic Rim[26] have resulted in overwhelming pressures on those earning their livelihoods from agriculture and fishing. The latter have also had to contend with, sporadic – but increasingly frequent - storms, further endangering an already dangerous source of employment. Under these circumstances only the most ambitious and well funded diversification efforts have been able to withstand external trade competition and environmental challenges. In terms of temperature, the effects of climate change are being felt more dramatically in the South than in the North of the Region. In Portugal, France and South-West Spain rising temperatures and, in Central and Southern Portugal repeated droughts, have resulted in problems related to water shortage. Between 2015 and 2030 though, the flow of persons from the North of the region and Central parts of the EU has increased, particularly of retired people. Established 'elder communities' have become embedded which has stimulated local economies, without the disruption and resentment caused by tourist developments dominated by the young. Nonetheless from 2015 onwards there have been outbreaks of frustration as different generational and socio-economic cohorts become spatially more segregated and the contrasts in their lifestyles more apparent, particularly where wealthier retirees and 'remote' workers are seen to occupy the most naturally appealing areas.

EU transport and external trade policies continued from 2007 to work towards increasing accessibility. There were inevitably conflicts of interests though as representatives argued over which measures and monies should be introduced to counter-balance the exaggerated peripherality of the region relative to the shift of EU attention and activity eastwards. Regional attempts to re-open international trade points across the Atlantic and with North Africa were broadly supported. By 2030 such efforts had met with varying degrees of success. On the one hand, exports from the EU were still handled mainly by ports in the North East and Mediterranean and most large ports in the region suffered from further falls in bulk and container traffic. On the other, the trans-shipment port west of the English Channel has been handling more feeder traffic consignments, linking the north-south network and the connectivity of the North-West of Spain has improved with the building of new high speed train lines. Also promisingly for small communites along the Atlantic Rim, there have been some indications of revival in ferry activity and other 'roll-on-roll-off' traffic.

[25]This has led to incidences of rotting and subsequent disease of traditional crops.

[26] Conservation measures intended to retain stocks in the long-term have increased pressures on the fishing sector in the period up to 2030 and although the development of aquaculture has supported some local communities, it has been arguably at the cost of increasing further damage to the surrounding sea and local fish populations.

The fate of tourism, important to the economy of the Atlantic Area, has also been determined more by global trends and the variable impacts of climate change than the, also variable efforts of local, regional, national and European level actors. The total number of non-EU visitors was still rising by 2030, but a large proportion still confining their attention to historical and cultural capitals. The appeal of coastal areas, relying mainly on EU tourists, has been more erratic. Some of the most popular resorts have been most subject to erosion, exacerbated by the previous concentrations of people and settlements. However for those seeking solitude the most underdeveloped inland areas and some of the most rugged coastlines have developed a new line in 'green' tourism, also offering an opportunity for landscapes to revert to their semi-natural state.

International trends in the decade leading up to 2030 had other pay-offs for some remote workers and regions. Developments in the field of telecommunications and satellite technology have contributed to the 'death of distance' in specialised spheres, encouraging distance work and creating more scattered settlements around the perimeter of old towns and cities. In turn though, the demand for individual mobility grew inexorably; increasing the pressure on 'home-grown' energy supplies. Private companies and national governments responded to this with the development or expansion of nuclear reactors along the coast of Portugal, France and the UK. Demand for energy and reluctance to rely on external sources also maintained the mining for coal in the North West of France and the UK and oil in the North Sea, resources permitting. Hydro-plants were expanded along much of the coast, as have investments in renewable forms of energy, most notably wind and wave power. The impetus for the latter has however relied on local support, research investment and trans-national co-operational and been somewhat lost as dependence on nuclear power has continued both inside and outside of the EU.

Initiatives fostering transnational co-operation were fairly successful during this period as governments struggled with problems with which they were clearly unable to deal with alone. While these have had positive implications for some communities in strategic locations, others have declined further and pockets of unemployment have persisted. The emphasis on ethnic, religious and regional identity since the beginning of the century has remained strong and promoted by the mass media. In this context, national integrative policies, where operative, have come under stress and the corrosive effects on cohesion of focusing of differences are apparent in parts of the most cities and in some medium-sized towns. Multi-culturalism is apparent increasingly in the form of 'separate development' with a flourishing of sectarian schools, care homes and even hospitals. The most deprived out-skirts of all twelve metropolitan regions have become 'ghettoised', functioning as dormitory settlements for the main cities whose finanacial and historical centres, by contrast, have retained their international appeal and competitive advantage.

North-West Europe

By 2030, North-West Europe (NWE) can still be considered the economic powerhouse of the continent. A significant part of the European 'pentagon' area falling in this region ranks highly in terms of productivity, innovation and competitiveness. There are relatively high levels of cultural workers in NWE, a sign that this region has been well poised to meet the demands of the new economy. The absolute level of urbanisation, density of infrastructure, economic production and energy consumption is still among the highest in Europe. Yet this does not necessarily mean that these indicators hold in relative terms: the density of road and rail infrastructure per capita, for example, can be much lower than elsewhere. Nor is the NWE territory homogeneous: some areas exhibit very high levels of economic development, whilst others have features more often associated with 'peripheral' regions.

There has been a continued and steady growth in major service centres such as London, Paris, Brussels and the Dutch Randstad. Even higher growth rates have been found in

regions outside of these central metropolises however, as the success of Denmark, central Scotland and Ireland demonstrate. As a whole, NWE has enjoyed a reasonable rate of growth, and most regions have maintained their position in terms of GDP/capita vis-à-vis the European average. It should be pointed out that the most dynamic growth in the European context has taken place in the central and eastern member states. Consequently, the relative position of NWE by 2030 is slightly less prominent than it was in 2005.

With regard to transportation and accessibility, after the current stock of priority projects have been completed, very few TENs have been initiated in NWE. Attention has shifted to missing links in the East, such as connecting Greece and Estonia. In 2030 NWE still has the highest density transport network in Europe, yet is showing serious signs of strain and congestion. Furthermore, various parts of the transport system are based on obsolete technology, ill equipped for the demands of the new millennium. This situation is aggravated by the ongoing growth of population in metropolitan areas, and the lack of policy attention at the European level. Economic growth has spurred increases in energy consumption, although the restructuring towards a more service-based economy has mitigated this. External energy dependency has increased in NWE since the potential for renewable energy is limited. In this regard, the high rate of urbanisation and consequent high land prices, especially in the core area, did not provide much room for biomass production in NWE, except in northern France and a few other rural areas, as an alternative to declining CAP support.

Like the rest of Europe, NWE has been subject to accelerated population ageing and a decline of population growth. In the global cities of London and Paris and MEGAs like Brussels and Amsterdam though, the ageing process is slower and population growth higher than in the EU as a whole. The reason for this is that these cities attract many young people, skilled as well as unskilled, and the fertility rates are higher than elsewhere. In areas with traditional industries like the Ruhr area and Lancashire however, the ageing process is faster and population growth is lower than the European average. These areas are unable to halt depopulation since they are only partly successful in restructuring themselves. Because of that, many highly skilled people have migrated towards the global cities and the MEGAs of NWE or to North-America and Southeast Asia.

Regarding urbanisation, the pentagon has been expanding towards the British Midlands, southern Scandinavia, the Rhone valley, and the Central European MEGAs of Prague, Vienna, and Bratislava. In urban areas with high transport density, like the Randstad and the Ruhr area and other metropolitan areas, growing energy prices have favoured compact cities with contained volumes of commuting movements, higher use of public transport and better integration of urban functions. In the global cities, spatial, social and ethnic segregation, manifesting itself in the development of 'no-go' areas and gated communities, has been increasing. In regions with traditional industries, large, medium-sized and small towns have been declining. These regions have been facing serious difficulties in recovering and generating new activities.

Public policies aimed at the reduction of illegal immigration have been unable to stop the influx of low-skilled people into NWE. These people, who usually settle in the global cities and MEGAs, have been facing serious difficulties with regard to the labour market and society. Measures taken by local authorities have been rather incoherent and resources insufficient to solve the problems. In cities like Paris, Antwerp and Rotterdam violent manifestations have periodically erupted. This stimulated a significant number of people to migrate to the rural surrounds of cities like Champagne, Flemish Brabant, and the Green Hart of Holland.

In more polycentric metropolitan areas like the Ruhr area and the Randstad, which have further developed as urban networks, partnerships between local authorities have

intensified, but are limited mainly to industrial and service estates, residential and recreation areas and transport infrastructure. Their effectiveness is limited because of the competition between local authorities and the lack of binding policy-instruments.

Rural areas close to metropolitan areas like Paris, London and the Randstad, experienced endogenous population growth and have attracted highly skilled migrants. These areas have evolved into residential and recreational landscapes, largely determined by market forces, and with few public investments. Recreational and natural values have been competing for space with residential, high-tech and intensive agriculture land uses.

The urban environment of the NWE region has continued to experience problems with air pollution, although the introduction of cleaner car technologies has improved air quality in cities somewhat. In spite of strict EU regulations, increasing transport intensity has made it difficult to improve the air quality in large metropolitan areas. These problems are common to all metropolitan areas and medium-sized cities in NWE.

North Sea Region

The NSR has fared relatively well with solid economic growth figures. The only areas which have lost ground, to some extent, are the port cities of Hull, Newcastle and Aberdeen in the UK and (to a lesser extent) Hamburg and Bremen in Germany. Other port cities like Rotterdam and Antwerp have developed better. The best performance in the entire region has been recorded in the metropolitan area of Edinburgh. Economic growth has had a positive impact on the development of maritime traffic between the ports of the Benelux and the Baltic Sea Region, especially Copenhagen. Rail freight lines have also developed along this main corridor connecting the two maritime basins.

The progressive depletion of the energy resources of the North Sea (oil and gas) has nonetheless been a major problem for the economy of the NSR, explaining partly the economic decline of a number of coastal sites which had benefited from decades of oil and natural gas revenues. The energy dependency of the NSR increased significantly and impressive renewable energy projects were initiated. Offshore and onshore wind parks were developed, taking advantage of the huge wind energy potential of the region, but sometimes creating conflicts with respect to the protection of landscapes and natural coastal sites (especially near residential and tourist locations along the Dutch and British coasts) and with maritime traffic in the straights (especially the Copenhagen region). Technologies in the field of tidal energy have become mature, allowing large-scale turbines to be implemented in select regions.

By 2030, MEGAs like Oslo, Copenhagen and Amsterdam have experienced a faster population growth than Europe as a whole and slower population ageing. These MEGA's have developed more advanced economic activities and have therefore attracted more young immigrants. A large number of attractive rural areas, particularly those located along the coasts from the Strait of Dover across to Belgium, the Netherlands and Germany to the Danish west coast have been subject to population increase as a result of the migration of retired people and of freelance workers from large cities. The same is true for medium-density areas, e.g. in south-west Sweden, Jutland in Denmark and north Germany. At the same time, port cities like Hull, Newcastle and Bremen, have become more and more depopulated. This is also the case in peripheral rural areas such as the Scottish Highlands, the inland areas in southwest Norway, and the Wadden islands.

Most of the metropolitan areas in the region are connected by a dense network of highways and high-speed train connections. The MEGAs and the many urban agglomerations with regional importance in the NSR, like Edinburgh, Bergen, and Groningen have become influenced by increasing insecurity; strengthening spatial and social segregation like 'no-go'

areas and gated communities. At the same time these cities have been also reshaped by growing energy prices, favouring compact cities with lower volumes of commuting movements, higher use of public transport and better integration of urban functions, as in the Dutch Randstad. Port cities like Hull, Newcastle, and Bremen, have been declining. They have been facing serious difficulties in recovering and generating new activities. Towns in peripheral rural areas have generally declined as well.

Illegal immigration has continued up to 2030 despite public policies aiming at the containment of this process. As a result, more people with low education and skill levels have settled, particularly in seaport cities such as Antwerp, Rotterdam, and Hamburg. They have been facing tremendous difficulties in becoming integrated into society and the labour-market, which has resulted in periodically violent manifestations in some cities. Reactions have ranged from increasing xenophobia to population moves towards the rural areas surrounding such cities, e.g. towards, the Cleveland Hills in the UK and the Green Hart of Holland, and towards high-level tourist and retirement areas, particularly along the North Sea coast from the Strait of Dover to the Danish west coast.

The evolution of rural areas has been differentiated, depending on the competitiveness of the agricultural sector and on the proximity of large cities. In the south (England, Benelux, Germany, Denmark), the focus has been on industrialised agriculture, with some small investments in protected areas and cultural heritage. Pressure from nearby metropolitan areas has increased. In the north (Norway, Scotland), rural development has been supported by promoting tourism.

Water is one of the most pressing issues in the NSR environment. The surplus of nitrate application in areas with intensive agricultural poses a real threat to water quality, particularly in the densely populated delta areas in the Benelux and Germany. Ground water is most affected in the long term. River water quality (Rhine, Elbe), on the other hand, has been increasing due to improved waste water treatment. Still, eutrophication remains a problem as a result of the nitrate surplus, affecting both local ecosystems, as well as north-sea water. Climate change affects the water regime of all river catchments, leading to increased flood frequency. The response in most cases has been to raise river dikes. Of course, this does nothing to stop the trend towards more and greater floods. Rising sea levels is an issue in the long term and is only broadly perceptible by around 2030. Storm events in combination with peak river discharges already pose a risk to many of the delta areas of all main rivers in the area (Schelde, Rhine, Elbe, etc.).

Northern Europe

The Baltic Sea and northern periphery area stand out as being fundamentally heterogeneous and dichotomous in nature, especially with regard to the population density divide between north and south, and the economic divide between the south-east and north-western parts of the area as a whole. Thus in demographic terms, by 2030, current trends continue to sub-divide the area along these north-south, east-west, and urban-rural lines. In Denmark and Norway population growth continues, while Finland and Sweden witness urban growth but rural decline. The south coast of the Baltic, Poland and the German part of the Baltic Sea Region (BSR) area see the reverse, with urban decline and rural growth in population terms although, at least in Poland, this may be attributed to urban sprawl around city hinterlands), while the Baltic States and the Russian BSR area all experience a continuing overall decline in population terms. MEGAs on the southern coast of the Baltic Sea however are not so affected. Population ageing increases across the area with the exception of the areas encompassing the major Nordic capital regions, with Poland and the Baltic States in particular seeing significant further population ageing. What's more, while immigration policy has little more than a limited impact on the 'receiving' areas (e.g. the Nordic capital regions) it further exacerbates the demographic problems within

particular age groups in the eastern part of the region. Outward migration continues to affect the Baltic States and Poland, and remains targeted to the EU15 countries, particularly Western Germany, Ireland, and the UK.

In economic terms, this region is again fundamentally heterogeneous in nature. While general economic growth in the region (with the exception of the German and, in particular, Russian BSR areas) continues to outpace the EU average, with labour productivity increasing, spatial polarisation is increasingly exacerbated. The main engines for development are the main metropolitan areas in the region: Stockholm, Helsinki, Malmö-Copenhagen, Oslo, Gothenburg, Hamburg, Berlin, Warsaw, Krakow, and St Petersburg. At the beginning of the period in question, the BSR area, while hosting many of the EU's wealthiest regions, also included 56% of the 100 poorest EU regions.[27] Moreover, sub-regional polarisation remains sharp in the German BSR, Poland, and in the Baltic States, where it is increasing, in the Nordic countries. Regional disparities increase across the board, with the urban-rural divide, or more precisely, the MEGA-rural divide, being particularly important here as economic development is generally concentrated to urban growth poles. In addition, the oil and gas pipeline system is upgraded, to reduce energy dependency and ensure energy security, particularly as this relates to the eastern parts of the region.

Similarly, in the nexus of transport, energy and environmental policies, the BSR region and its northern periphery extension are highly differentiated in many respects. One constant here is, however, the increasing reliance on nuclear energy across most of the region, although the BSR does remain committed to maintaining its lead in the development of 'alternative energy' products, particularly in relation to wind and hydropower (depending on local circumstances). A second is – despite energy price rises – increasing reliance on car transport and thus on motorway construction. The Baltic States do not have significant railway infrastructure and in Poland railways are being neglected.

In environmental terms, while the 'clean up' of the eastern part of the region continues, serious questions remain in relation to the prevailing conditions in contiguous areas such as Belarus and the Russian BSR, while global climate change continues to have a potentially fundamental impact on the fragile and vulnerable ecosystems of the far north. In addition, the impact of the dumping of hazardous materials and military waste in the Baltic Sea that occurred throughout the Cold War period continues to have a negative impact. Progress has however been made in decreasing emissions and in developing forests.

In sum, the area as a whole continues to develop at its own pace, though with marked spatial differentiation occurring at almost all levels. Economic growth has been much stronger in the major urban centres and their immediate surroundings, with the eastern part of the region in particular shedding rural, but also urban population, much of which then feeds the growth of the service sector in the cities or migrates to the west. The northern part of the region meanwhile undergoes a slow but steady decline, except where dynamic urban environments can attract a 'critical mass' of development potentials to counteract the general trend.

Alpine Space

Until 2030, population ageing has caused severe impacts in the Alpine Space. Since 2015, many peripheral areas in higher altitudes and remote valleys have lost a large part of their working age population to urban agglomerations in the foothills of the Alps like Milan, Zurich, Geneva, Lyon, Torino, Munich, Vienna and Ljubliana. This is where the population has been concentrating. Simultaneously, the overall population density for the Alpine Space

[27] Figure for 2002, measured on the basis of NUTS 3 areas.

has slightly risen. Given that the habitable space is very limited by topography, the settlements exhibit very high densification and an enormous urban sprawl. The remaining population in the peripheral valleys has entered a vicious circle of low infrastructure endowment and maintenance, reduced public services and less attractiveness for potential newcomers. As a consequence, by 2030, many traditional Alpine villages have been more or less abandoned. Some regional centres with good accessibility to transit routes, such as Grenoble, Lucerne, Innsbruck, Bozen, Trient, and Villach/Klagenfurt have experienced some growth, which enhances their resources for skilled manpower but also increases urban sprawl along valleys.

Despite the EU enlargement in 2008 and an increased external migration, these events have played no important role for the economy of the Alpine regions as immigrant workers have preferred the urban context of the agglomerations in the Alpine foothills. In cities like Lyon and Zurich socio-cultural tensions have grown as the integration measures for foreigners have not been sufficient. Most of the bigger agglomerations in the Alps have experienced problems related to the abandonment of city centers, including neglected infrastructure and buildings, leading to a further spatial expansion of the settlements and stronger segregation processes between core cities and suburbs. In the villages and towns located in the most beautiful parts of the Alps, there has been a strong demand for second homes, as for example in the regions of Mont Blanc, Gran Paradiso/Aosta, Valais, Engadin, Oetz Valley, Upper Tauern and the Dolomite Alps. This demand has led to the creation of ghost towns, which boast a highly developed infrastructure but are only inhabited three months out of the year. In order to cope with the seasonal imbalance in regional income, Switzerland, Austria, France and Italy have reinforced the establishment of regional natural parks both for the protection of the mountainous environment and the diversification of income through tourism and the promotion of regional products (as, for example, cheese, herbal products, berries, and local handicrafts).

Agriculture in the Alpine Space has been in continued decline, despite more direct payments and CAP adaptations. Small holdings in the higher altitudes are the first to be abandoned. Alpine agriculture has lost its competitiveness and its contribution to the GDP is minimal. Some surviving farms have become projection screens for nostalgia, marketed by tourism managers. Farmers in the upper Alps have turned into landscapers to conserve the 'near-nature character' of mountain areas for attracting tourism. Agricultural production has concentrated and intensified in bigger farms in the flatter lowlands of the Po and Rhone rivers, as well as in Bavarian Danube valley and the Swiss lowlands.

Due to climate change, the snow line has mounted and the season for winter sports has shortened by over one month on average. Tourism associations have taken adaptation measures to intensify tourism in the other seasons. Thus, tourism has developed in two ways: a concentration of mass tourism for winter sports in several Alpine tourist centres in high altitudes (for example, in Tyrol, Carinthia, Styria, Dolomite Alps, Grisons, Valais, Mediterranean Alps) and experience-based eco-tourism combined with wellness holidays (thermal cures, beauty, golf and other outdoor recreation) in the lower Alps, valleys and lake regions.

The overall increase in individual mobility and goods transport has led to a steady rise of transit traffic concentrated on the Brenner, Gotthard and Mont Blanc routes and tunnels. In parallel, frequent congestion on the North-South axis, noise exposure and bad air quality have led to strong efforts in central Switzerland and the Inn valley to limit road transport and accelerate the construction of railway tunnels for transit. By 2015, the new Gotthard basis tunnel has been put into operation, allowing for a massive transfer of road haulage onto rails and for high-speed railway connections between the Pentagon and Italy. The same effect has had the Brenner basis tunnel, finally finished in 2020, which is part of the TEN and key element of the Berlin-Verona transportation axis.

The taxation of greenhouse gas emissions from households and cars has been introduced but none of the Alpine countries were able to meet the goals of the Kyoto protocol. Ongoing climate change has resulted in the retreat of glaciers, droughts on slopes exposed to the South (especially on the southern and western side of the Alps in Piemont, Lombardy, Upper Savoy, and north-western Switzerland), regular flooding in river valleys and lakes, and environmental damages by storms and heavy rainfalls. Landscapes have been exposed to excessive erosion and destroyed. The agglomerations have also suffered under the heat island effect, thus increasing mortality rates of elderly people during the summer months.

In a period of ongoing globalisation, much industrial production in the Alpine Space has disappeared. Only high-quality products based on research and development have been able to expand on the world market, such as pharmaceutical production, aeronautical engineering, space technology, the watch industry in Switzerland, and ecological engineering (photovoltaic installations, wood pellet burners etc.) in Austria. Despite increasing revenues from tourism, GDP per capita has decreased in the central Alps, and the spatial structure has become clearer: competitive economic centres (like Zurich, Lyon, Torino, Milan, Munich and Vienna) in the Alpine foothill regions in contrast to tourist centres in the winter sport resorts, and peripheral, non-competitive rural areas with ageing populations inside or outside regional nature parks. The region of Munich dominates the Alpine Space in terms of GDP per capita, which is also high in Tyrol, Baden-Württemberg, the region of Lyon, and South Tyrol. Mainly the regions of Munich and the Tyrol have been able to improve their economic position. On the other hand, the regions of Besançon andDijon, Alsace, but also southern Germany, the French Alps, and the Veneto have lost in their relative importance for the European economy.

The non-EU countries Switzerland (mainly the cantons of central Switzerland) and Liechtenstein have continued their low-taxation policy and maintained their banking secrecy, thus attracting the European headquarters of a large number of transnational corporations. This has led to a strengthened banking sector in these countries and additional related jobs in the service sector. Monaco, too, has remained a fiscal paradise.

High oil prices and increased energy consumption have favoured the use of renewable energies. In addition to the traditionally high share of hydroelectric power, solar energy as well as geothermal sources have been further developed, and their overall energy efficiency has been improved. Also farmers in the lowlands have begun to produce bio-fuels as a natural by-product of agricultural production.

Central and Eastern Europe

The area is extremely differentiated in demographic and economic terms. It comprises some of the most prosperous and developed regions of Europe (Bavaria, Lombardia, Emilia-Romagna, Vienna) and also the poorest and least developed regions of Europe (Kosovo, Moldova, Albania), the regions with the largest natural population growth rate (Kosovo, Albania, Eastern Poland and Slovakia) and also those with the lowest (and sometimes strongly negative) growth rates (Germany, Austria, Hungary, Czech Republic, Bulgaria, Italy). By 2030, population decline has been especially strong in the Central and South-Eastern European countries, due to both low natural increase and emigration. A new phenomenon of migration flows has been that Eastern member states became also destinations of immigration. A growing number of Turks migrated to Hungary, Romania and Bulgaria, and a growing number of East Slavs to Poland, the Czech Republic and Slovakia and South Slavs to Slovenia (the similarity of language makes the environment more familiar and integration more easy). Economic disparities are even stronger.

Despite significant convergence trends, the welfare gap remained substantial in 2030. There was a very strong catching-up process between 1995 and 2010 (6-8% per year in some countries), but it was more or less a "reconstruction period". Growth rates decreased in the following period – partly because of the increasing energy costs - but were still higher than the EU average. Simultaneously, disparities within the individual countries continued to increase. Metropolitan regions like Prague, Bratislava, Budapest and Warsaw surpassed the EU average level of income generation substantially due to the extreme concentration of banking, financial and tourism services. Other regions, especially the more rural and peripheral ones, stagnated in relative terms, or continued to decline.

The growth and competitiveness of regions has been a function of the FDI. Moreover, since the location of FDI has been rather selective and rather indifferent to cohesion considerations, the result has been a dramatic increase of economic and income disparities among and within the countries of the Eastern CADSES area. Up to 2030 the share of foreign capital decreased slightly, but it retained its decisive role both with respect to economic growth and structure, and to location trends and disparities, giving preference to metropolitan areas and to areas closer to western markets and thus strengthening and/or petrifying existing disparities. Western border regions in these countries have partly lost their original privileged position for attracting FDI. FDI moved gradually eastwards in these countries, as a result of improving accessibility. Some enterprises, located here in the period immediately after the system change in the early 1990s, moved further eastwards looking for even cheaper labour. Furthermore, the former forms of "bazaar economy", utilising the opportunities offered by the economic, institutional and legal gaps along the collapsed "Iron curtain" lost their attractiveness and profitability. Simultaneously, similar, but less intensive opportunities and phenomena, emerged along the new eastern borders of the EU to the Ukraine, Moldova, Belarus, Russia and Turkey. On the other hand, the geographic and/or the political position of very peripheral and backward areas in Montenegro, Albania, Kosovo, FYROM and the Black Sea coast in Romania and Bulgaria changed very favourably and these areas exhibited a very dynamic development.

Most countries of the area have implemented a fairly large-scale motorway construction programme in the period 2000-2015. These programmes substantially improved the accessibility of some regions directly affected. Railway networks developed less intensively (except for main corridor routes linked by high speed trains). In less densely populated areas railways were replaced in many cases by road transport due to improvements in regional and local roads. With the passing of time, multi-modal transport gradually developed. In the early 2000s, there was an expectation with respect to the emergence of a new European Global Integration Zone in Central Europe, stretching from Warsaw and Berlin, through Prague and Vienna to Budapest. Indeed, these metropolises and their agglomerations have shown the highest rates of development. By 2030, these metropolises still might represent the corner stones of a future "Central European Triangle" (Berlin, Warsaw, Prague, Vienna, Bratislava and Budapest) which may potentially serve as an engine of such Global Economic Integration Zone.

With regard to the environment, disparities are also significant. Neither rapid economic growth, nor 'backwardness' are favourable to environmental protection. Traffic growth in and around metropolitan areas, combined with lower technological standards of the rolling stock (cars, trucks) resulted in suburbanisation and further air pollution. Intensification of agriculture in fertile areas (production of energy crops and cereals, cattle breeding etc.) generated ground water pollution. The environmental damage of climate change (flooding in main valleys, drought in the southern regions etc.) remained significant.

Southern Europe

While Southern Europe as a whole presents a significant level of integration, spatial integration is more intense both in South-Western and South-Eastern Europe. A second

division is obvious in Southern Europe among, on the one hand, regions which clearly belong to the European "south" i.e. they are more rural and very dependent on tourist development (as for instance the zones located closer to the sea) and, on the other hand, the zones of high level Research and Technology as well as modern service development (such as some zones of northern Italy, and Spain around important MEGAs as Milan, Barcelona, etc.). Some of the latter are already included in the pentagon, or integrated in an "extended pentagon".

Until 2015, population ageing has been more intense in north-west Italy, Sardinia, Corsica, northern rural Spain and southern Portugal. By 2030, the problem has also affected the rest of the Mediterranean area, with the exception of south-eastern France, Crete and Cyprus, as well as south-western France. Life expectancy is at higher levels in South-eastern France, Italy and North-eastern Spain than in southern Portugal and in Greece (except from the western regions). The Mediterranean area (especially Spain, Italy and Greece) has been subject to strong pressures from external immigration. It has also benefited from internal immigration from other West-European regions (especially retired people) in response to its favourable climate conditions. By 2030 almost all of the area has a weak demographic potential (in particular Sardinia, Corsica Portugal, northern Spain) apart from Crete, Cyprus and south-eastern and south-western France.

Only a few southern European regions have been improving their economic position in the European context (Lazio, Piemonte and Campania in Italy, Attiki and Epirus in Greece, Provence-Alpes-Côte d'Azur in south-eastern France and Cyprus). Most of these regions have large metropolitan areas, but this has not been an absolute pre-condition for success, since metropolitan regions in the Iberian Peninsula have not improved their relative position. In terms of GDP per capita, contrasts remain significant by 2015, with most regions of the Iberian Peninsula (except Madrid, Catalonia and the Bask Region), of southern Italy, of Greece, Cyprus and Malta, being far behind the regions of southern France and northern Italy. This reflects the fact that the Lisbon Strategy has not been efficient in the south-western and south-eastern peripheries of Europe, with very few exceptions.

As a result of the increase of oil and gas prices, peripheral regions of Southern Europe which are more dependent on transportation have become less competitive. Large cities like Milan, Rome, Madrid, Barcelona, Valencia and Athens and medium sized cities have been in a better position than the small, dispersed towns. Rural areas have been more affected by the new energy paradigm. This has become a major problem for Southern Europe because it includes many rural areas that are still very dependent on agriculture. However, because of the comparatively favourable climate conditions, the Mediterranean regions (particularly the coastal and insular areas) have had the potential to reduce the negative effects by developing the use of renewable energy sources (mainly solar and wind energy) and promoting tourism.

Support to the TEN-T networks in more peripheral countries and regions, has been of significant benefit to a number of regions of Southern Europe, mainly to the Greek and Portuguese ones. However, as TEN-T networks have given priority to the connections between metropolitan areas, polycentricity at national level in Southern Europe has been reduced. Large cities in the more peripheral zones remained rather isolated in their development process and have not significantly benefited from network and synergy effects.

Climate change has had detrimental impacts on water resources in Southern Europe because of severe and sustainable drought in most countries and regions, with the progressive abandonment of dry lands, the reduction of energy supply in areas depending on hydroelectric plants and a rise in the risk of forest fires. These have exerted irrevocable damage to traditional landscapes. The impacts of climate change have been detrimental to the economy of numerous rural regions. Drought has severely reduced agricultural production. Tensions for water have intensified (i.e. in Spain and Greece, between developed regions that need water and undeveloped regions than can provide more water).

Water pollution has generally been reduced (even in industrialised areas). However, intensification of agricultural production has been causing a rise in nitrate diffusion levels, such as in northern Italy. Not only the intensity, but also the frequency of heavy rainfalls has been causing important damage. Natural (especially coastal) areas have been subject to stronger pressures because of the development of tourism and second homes. Winter tourism has regressed in the mountains of Southern Europe (Pyrenees and the southern Alps), because of increasing average temperature. Gated communities have emerged in tourist resorts.

Tourist development and a growing demand for second homes combined with the growing immigration pressures, mainly in metropolitan areas, have supported the continuation of the development of the urban sprawl.

Spatial integration both in the entire southern Europe area and in its western and eastern parts, taken as discrete entities, has been intensified to a moderate degree. The pentagon has been expanding to a certain degree towards the rest of northern Italy, a part of southern France and a part of northern Spain. This expansion concerns mainly the important metropolises as for example Barcelona. In the central and southern part of the Balkan region spatial integration has been intensified to a moderate degree mainly based on an increase in the network relationships among the important metropolises of the region: Athens, Thessalonica, Sofia and Bucharest.

Areas with low population density

Areas with low population density (less than 10 inhab per sq.km) are essentially in the northern periphery (northern Norway, Sweden and Finland). Under baseline assumptions, these areas have by 2030 a population with a median age significantly higher than in the early 2000s, without reaching, however, the highest values found in various regions of southern Europe. By 2030, the oldest population is found in eastern Finland, with a median age above 50. In the Swedish and Norwegian regions, the median age is around 45 and in the upper north of Finland (Lapland), median age is lower (around 40). As there are no significant regional differences in life expectancy, the demographic potential reflects the median age. It is higher in 2030 in Lapland than in neighbouring regions. It is likely that population continues to decline in these regions, especially in the areas far from small and medium-sized urban centres.

In economic terms, the relative position by 2015 of the regions concerned has deteriorated, with growth rates below the European average, although the per capita GDP in these regions by 2015 is expected to be higher than that of other regions of the western European periphery, especially of the Iberian Peninsula, southern Italy and Greece. Clearly the low population density plays a part in this achievement. After 2015, the trend of falling relative competitiveness is expected to continue.

The Europe-wide accessibility of these areas and the accessible GDP, at less than 10 hours, have remained by 2030 among the lowest in Europe, with few investments in transport infrastructure, except for the road networks in the proximity of medium-sized urban centres (Oulu, Rovaniemi, Sundsval/Härnesand, Ostersund, Umea, Ulea). The very low level of rail infrastructure makes the transport system of these regions (road, airlines) more dependent upon oil. The continuous increase of oil prices has negatively affected the accessibility of these regions. A comparative advantage has however remained the important sources of renewable energy (hydro-power, biomass, wind) from which these regions benefit, added to the oil and gas resources of Norway.

Climate change had a number of positive impacts on these regions, with fewer cold winters, strengthening their attractiveness for winter tourism. They have benefited from a transfer of winter tourists from the Alpine area, more affected by climate change. Yet a negative

impact of climate change has been increasing hot summers with drought, producing damage to the vegetation, reducing the available biomass production and therefore reducing the outputs of forestry and related activities. Forest fires have also become more frequent.

Mountain areas

Mountain areas are extremely diverse in Europe with regard to both their natural and socio-economic characteristics. There are only few aspects held in common between the Norwegian mountains and the dry mountains of Mediterranean Europe. The impacts of the various scenario assumptions are therefore also diversified and heterogeneous.

Under baseline assumptions, there is no clear evidence of stronger population ageing in mountain areas than in other areas. There are in fact few mountain areas where the median age of the population particularly high in Europe by 2030 (north-west Spain, Sardinia, Corsica). By the same token it can also be observed that none of the large mountain areas (Alps, Pyrenees, Carpathians, Nordic mountains) have a low median age by 2030. In all of them, population ageing has significantly progressed between the early 2000s and 2030. The median age of the population in the mountain areas of Central and Eastern Europe is however lower than in those of Western Europe, because of lower life expectancy. The demographic potential by 2030 is low in most mountain areas, with a few exceptions (French Alps, southern Norway), when compared to the demographic potential of metropolitan regions. The depopulation of mountain areas up to 2030 has been much stronger in Central and Eastern Europe than in Western Europe.

With regard to the economy, contrasts in the evolution of the various mountain areas up to 2015 are stronger than in the field of demography. In Central and Eastern Europe, mountain areas (at least the valleys of mountain regions) benefit from a catching up process and have by then a better relative position than they had in the early 2000s. In Western Europe, only few mountain regions manage to improve their position (French, Swiss, German and Austrian Alps as well as the areas of medium-sized mountains of Wales and southern Ireland). These trends are likely to continue after 2015. But a number of structural changes have taken place. Agriculture in mountain areas has continued to decline because of low productivity and numerous small holdings in the higher altitudes were abandoned, while agricultural holdings in the piedmonts and lowlands have increased their size and were reduced in number. A large number of traditional industries in the valleys disappeared, while new activities with high added value and high technological content have emerged in privileged attractive areas of the piedmonts, there where the influence of metropolitan areas exists. This evolution has been particularly strong in the Alps. The piedmonts of other large mountain areas (Pyrenees, Carpathians) have been facing more difficulties in attracting modern activities.

Mountain areas have remained areas with relatively low accessibility at the local/regional scale, added to low Europe-wide accessibility in European peripheral regions. Exceptions are the valleys crossed by major transport axes of European significance. Increasing long-distance transit traffic has continued to cause environmental degradation. Improvements in this respect only occurred in the areas where new long-distance basis tunnels were built, serviced by modern, rapid railways.

Strongly affected by climate change, winter tourism in the Alps, Pyrenees and Carpathians has been seriously reduced, with higher snow lines and shorter seasons. Winter tourism has however intensified in the Nordic mountains, generating strong pressure on the environments. The environment of southern mountain areas has been deteriorating with increasing drought and frequent, damaging forest fires. Other negative impacts were on the

reduction of hydro-power capacity and of biomass production and related forestry activities. This has added to the desertification trends in these areas.

Ultra-peripheral regions

The territorial characteristics of the Ultra Peripheral regions (UPR) are extremely different from those of the regions of continental Europe. While continental Europe has been seriously affected by population ageing, most ultra-peripheral regions have been facing, by 2030, strong natural population increase, especially French Guyana, Martinique, Guadeloupe, Mayotte and La Reunion. The demographic evolution in the Portuguese and Spanish UPR has been less significant. In some remote islands of the archipelagos, population ageing and depopulation are even a problem. The pressure of external immigration has continued to be significant and has even been increasing. The volume of illegal immigration has been growing.

The economy of the UPR has remained excessively dependent upon mainland Europe. Because of higher labour costs than in the neighbouring countries on similar production (of bananas, sugar etc.), there are no markets for such products at proximity. Imports from extra-European origin are concentrated on oil products and main exports are oriented towards Europe. Transport costs are excessive compared with those of mainland Europe, with maritime transport taking care of the transport of goods and air the transport of people. Both transport modes are directly dependent upon the price level of crude oil. With increasing oil prices, the accessibility of the UPR has been decreasing, as no alternative transport modes exist between the UPR and mainland Europe or other countries. The development of low-cost airlines has however significantly alleviated the handicap of long distances, as long as fuel prices were not too high.

The labour market of most UPRs has remained weak and unbalanced with few qualified jobs and low availability of qualified manpower for existing jobs caused by the out-migration of qualified people. The economy of the UPR is more sensitive to various exogenous factors than that of continental regions, be it the impact of globalisation (trade liberalization of tropical products), of evolutions in neighbouring countries (economic evolution in the Indian Ocean region) or of public decisions (taxes on energy products, CAP evolution, structural policies). The UPR have therefore been more subject to asymmetric shocks than European mainland regions. In addition, the UPR play an important part in geo-strategic considerations of public or private stakeholders. Most of them are located on important maritime or air transport routes. They are also strongly related to the European policy of security and defense. These factors have contributed to maintaining a certain level of stability for specific functions (ports and airports and related services, control of immigrants etc.).

The UPR generally have a significant renewable energy (solar, wind) potential which has not been optimally exploited. They are also subject to significant natural hazards (hurricanes, typhoons, tornados, tsunamis), the impacts of which have not been sufficiently anticipated, with resultant damage. Some decisions in the field of environmental policies (for instance the disproportionably large share of areas designated under Natura 2000) are beneficial for the maintenance of biodiversity but detrimental for other land use types, including economic ones, because of the scarcity of available land on islands. Island regions are also more vulnerable to issues of maritime security and marine pollution. A number of UPRs have additional natural handicaps to those of insularity and remoteness: mountain areas, archipelagos with remote islands etc.

Under baseline assumptions, the UPR are more differentiated in 2030 than they were in the early 2000s because of differently changing contexts in the respective world regions where

they are located. The islands of La Reunion and Mayotte have benefited from booming economic development in the Indian Ocean region, while the UPRs in the Atlantic, especially the Caribbean ones, have been more affected by the competition of neighbouring countries. While the out-migration of qualified people has continued, illegal immigration has intensified. The UPR have been increasingly used by illegal immigrants as a bridge towards mainland Europe, although controls and measures against illegal immigration have also intensified. The support of the Structural Funds has been maintained but progressing liberalization measures, especially of the CAP, have affected indigenous productions. The benefits of low-cost airlines have been partly jeopardized by steadily growing oil prices.

3.6 Territorial issues arising in 2030 from the baseline scenario

Europe-wide level

Significant regional economic disparities still exist in Europe by 2030, but the disparities between East and West have become less than in the early 2000s. Between metropolitan areas and remote rural regions with low appeal, however, they have become more. New global economic integration zones did not emerge. Instead, the former pentagon has been widening along major corridors, encompassing a number of additional metropolitan areas. The wider pentagon is by far the most competitive part of the European territory. Differences in global accessibility between the wider pentagon and peripheral areas remain significant by 2030 and are accentuated by the strong increase in the cost of transport (oil). Outside the wider pentagon, the level of economic development is more modest (except for a few large metropolitan areas and some tourist regions). It is however much more modest in the East than in the West. The catching up process of weak and/or peripheral regions which generally took place after EU accession proved not to be of a long-lasting nature. After a period of 10to 15 years following accession, a differentiation process took place between regions with large metropolitan areas and those with a more rural character. A significant amount of EU public resources allocated to weak regions (various types of infrastructures) has not generated significant amounts of private investments (weak leverage effect). Pressure of illegal immigration is significant in most countries, but especially in those along the Mediterranean and eastern borders

Intermediate level

The level of polycentricity has been diminishing in the new member countries of Central and Eastern Europe and, possibly, in a number of western, less developed regions. In the new member countries, the relative accessibility of areas along major corridors has increased. In more remote areas, it has been reduced. Networks of cities have consolidated in certain transnational areas (Baltic Sea Region; Triangle of the CEEC), but not in all transnational co-operation areas. In some of them, transnational integration is still weak and few economic and technological synergies have developed. In a number of regions belonging to both East and West, the level of population ageing by 2030 is such that it generates a spiral of global decline which makes revival strategies difficult to implement. In a number of southern regions, the lack of prevention and adaptation measures related to climate change has produced long-lasting and substantial economic and environmental damage, especially in rural areas.

Local/regional level

The internal differentiation of cities has been strongly increasing, with urban areas becoming more and more attractive and others more and more repellent. Differences in real estate prices within cities are such that they accentuate the segregation process. Gated

communities have been developing. Problems of economic, social, educational and cultural integration of young population from immigrant groups have increased in various cities and have contributed to reducing their competitiveness and residential appeal. Numerous retirees and self-employed people have moved from cities towards attractive rural areas, where rents and real estate prices have strongly increased; creating or aggravating existing housing problems for the local population. A number of attractive coastal areas and mountain valleys are facing strong densification and urbanisation processes generating pressure on traditional landscapes and on natural areas. In fertile rural areas, the intensification of large-scale agriculture (export-oriented productions, energy crops) compounds environmental problems (ground water pollution, soil erosion).

4. Integrated prospective policy scenarios

4.1 Danubian Europe: Integrated cohesion-oriented scenario

4.1.1 Objectives and principles of the integrated cohesion-oriented scenario

This is a prospective, policy-oriented scenario. In this scenario, the main priorities of public policies at EU level, in a context of growing globalisation, are focused on economic, social and territorial cohesion and not on global competitiveness. This does not mean that the improvement of competitiveness is excluded, but rather, that in case of incompatibility between cohesion and competitiveness priority will be given to cohesion. This is for instance the case if growing competitiveness is likely to increase territorial disparities. It is however important to indicate that measures related to competitiveness in the context of structural policies are fully integrated in the scenario, even if they are likely to generate intra-regional disparities in less developed regions .

4.1.2 Hypotheses of the integrated cohesion-oriented scenario until 2030

Demography	- Restrictive external migration policies - More flexible retirement ages - Better balance of population structure through encouragement of higher fertility rates - More flexible arrangements for child care - Unchanged constraints on internal migration
Economy	- Maintaining the volume of the EU budget - Reinforcement of structural funds and concentration on weakest regions - Further harmonization of taxation and social security systems, as far as non detrimental to the competitiveness of less developed countries
Energy	- Steady increase of energy prices - Realisation of TEN-E - Promotion of decentralised energy production , particularly renewables
Transport	- Development of TEN-T with priority given to peripheral regions at different scales - Support to transport services in rural and less developed areas - Application of the Kyoto Agreement
Rural development	- Minor CAP reforms, but shift from pillar 1 to pillar 2. Priority given to less developed rural regions in the field of direct payments to farmers (pillar 1) - Priority given to environmental and animal health criteria - Promotion of quality products - Active policy for economic diversification in rural areas, including SMEs, tourism, residential functions etc.
Socio-cultural sector	- Promotion of regional and European identities - Integration of marginal groups like romany in peripheral

	areas - Proactive socio-cultural integration policies, particularly in cities - Increased fiscal and/or social investment in quality of life issues , like health, personal care, local environment, etc...)
Governance	- Active multi-level territorial governance, particularly in areas supported by structural funds - Strong role of public actors in territorial governance - Stronger role for the European Commission
Climate change	- Moderate overall climate change (+1°) - Increase of extreme local events - Constant emission levels - strict mitigation measures (taxes, road pricing as far as non detrimental to peripheral regions) - Wide range of adaptation measures like EU hazard funds and large investments
Enlargement	- Deepening preferred to widening - Brake on further enlargements (except Bulgaria and Romania) - Only lip service to neighbourhood policy

4.1.3 Scenario process

Demographic changes and related territorial impacts

A major difference with the baseline scenario in the demographic field is the revival of fertility rates in many European countries. This trend, which was emerging in a number of countries in the early 2000s, has been amplified by the support of public policies in favour of families. It is stronger in Western than in Eastern Europe. Immigration, the demographic variable with the most dynamic potential, becomes an increasingly contested issue in the policy arena. External migration thus becomes more restrictive. Migration policies within the EU are better coordinated and adapted to fulfil the goals of 'replacement'. They are strictly controlled by 'donor' country, area and region of destination and occupational group. Specific controls are also being introduced with socio-cultural integration in mind. Illegal migration continues however to supplement population, but the figures involved are declining substantially following the introduction of EU ID cards.

By 2030 there are indications of a more balanced population structure and of population growth in many areas, even those which had previously been threatened by serious de-population. This is caused by the new up-tum in birth rates, but also by strongly interventionist regional policies and strictly regulated and targeted migration strategies. Europe's structural demographic difficulties, however, have not been totally alleviated by these new trends and actions. Population ageing continues to affect various parts of the continent. Compared with the baseline scenario, population ageing (median age of the population in 2030) is less strong in western Spain, Portugal, East Germany, southern and north-eastern Italy, Slovenia, Ireland, south-eastern Poland and north-western Romania, but somewhat stronger in central Sweden and Finland, southern France, Hungary and central Scotland. The demographic potential (Index of sustainable demographic development in 2030) is somewhat stronger in southern and north-western Spain, southern Italy, southern France, Ireland, numerous Romanian and Polish regions, but it is weaker in central Sweden, southern Finland, southern Hungary, Estonia and Latvia. Falling total population is also continuing to impact many eastern, and some southern areas of Europe.

A significant difference with the baseline scenario regarding the impacts of demographic evolution is the introduction of more flexibility in a number of public policies in order to facilitate all forms of cohesion. Flexibility in child-care arrangements and pension ages are becoming the norm. Confronting institutional forms of ageism and removing compulsory retirement ages is part of this process, although it is less popular among certain occupational groups, particularly those involving physically demanding work. Flexibility is also extended to other aspects of life too, such as education; making family commitments more manageable. Allowances paid to grandparents and other older/retired relatives, instead of or as well as mothers are also becoming a widespread means of integrating the so-called third and fourth generations in community life and maintaining healthy life expectancy rates.

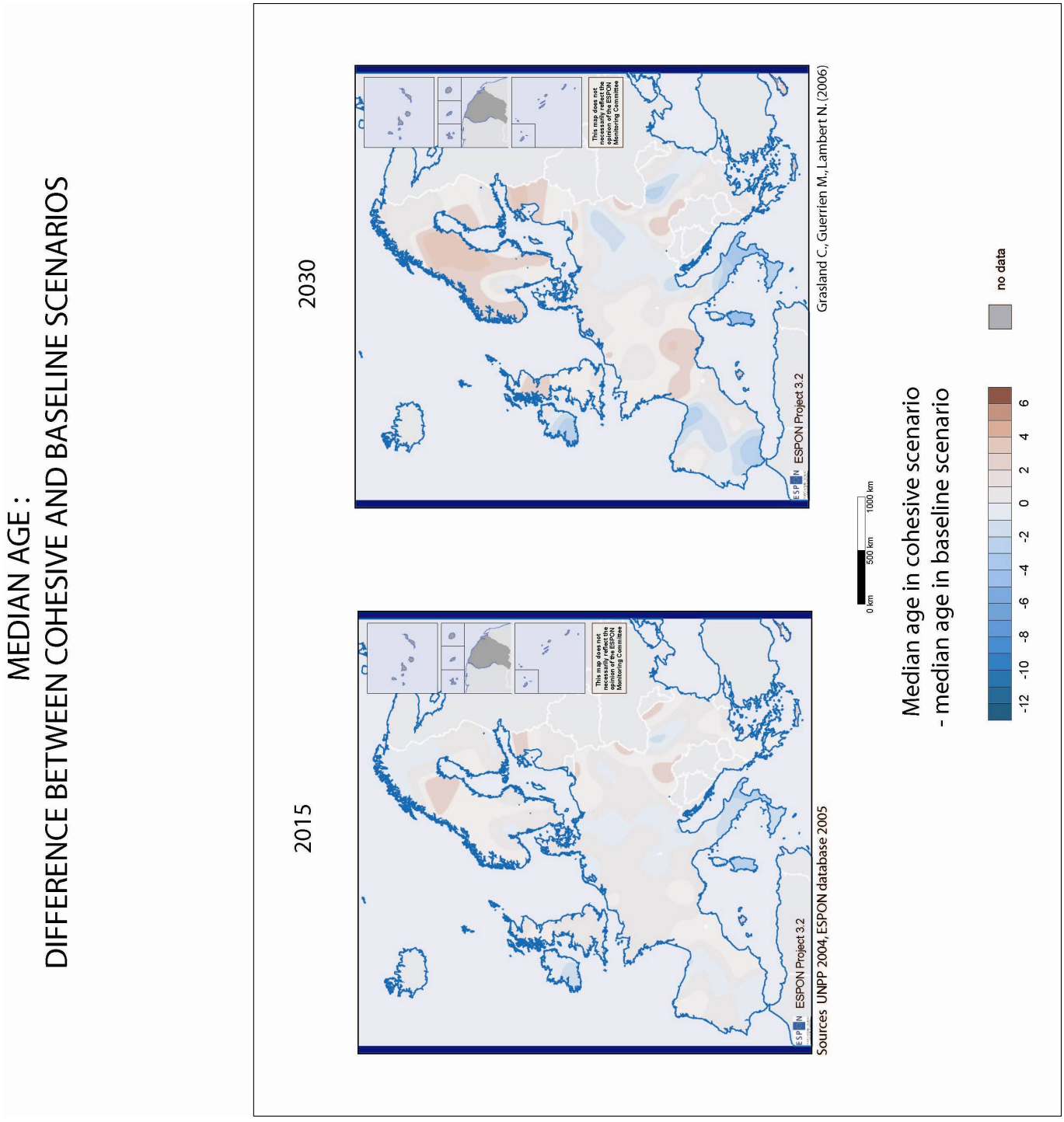


Figure 21 Median age: difference between the cohesion-oriented and the baseline scenario

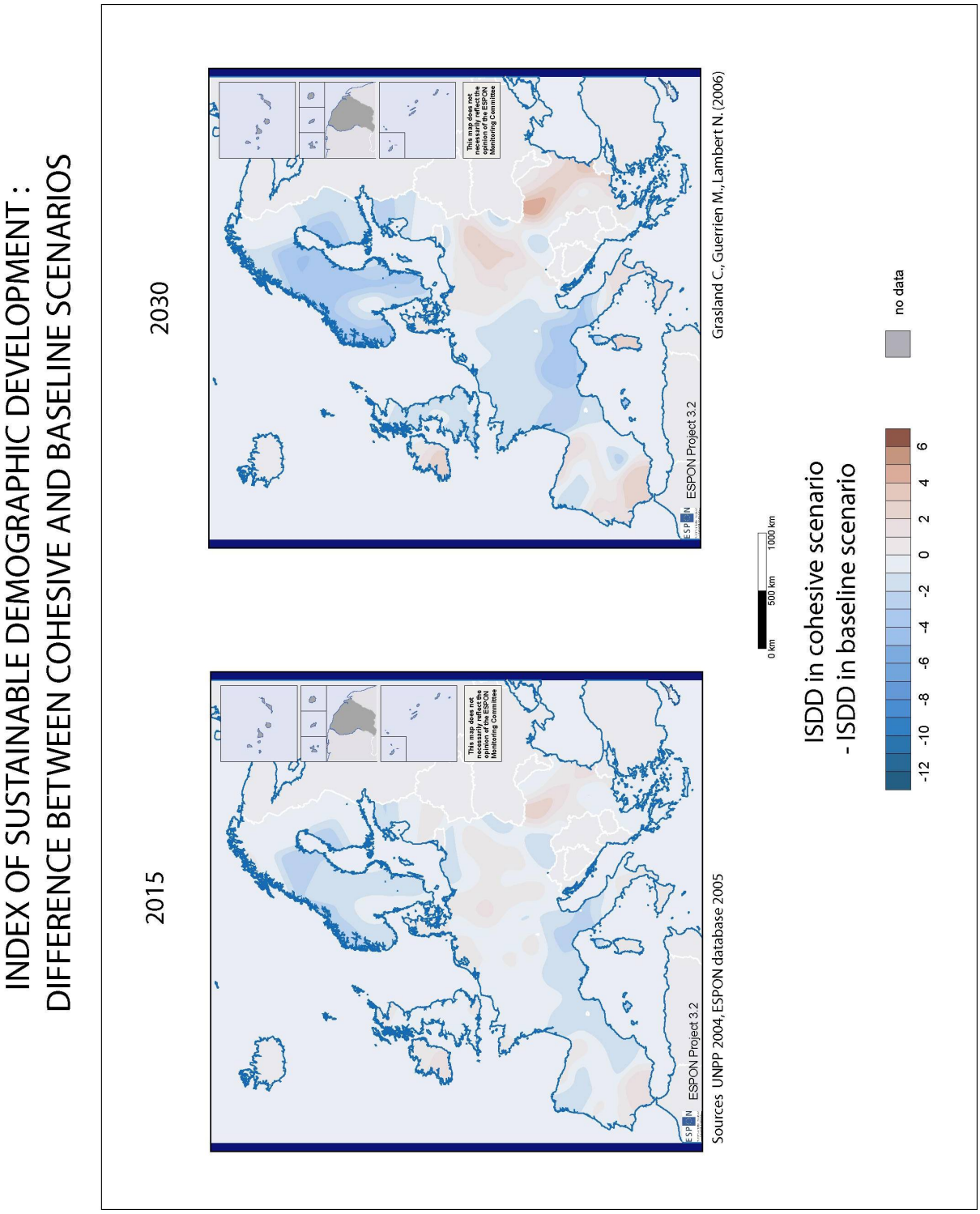


Figure 22 Index of sustainable demographic development: difference between the cohesion-oriented and the baseline scenario

Projects specialising in life-long learning are also becoming increasingly popular, opening up a wide variety of services and new forms of employment. Heavily subsidised through the tax system initially, many of these schemes are becoming self sustaining, profitable and 'exportable' as 'best practice' in welfare and community provision. Importantly in spatial terms the location of many of these new projects is at some distance from the major conurbations, deliberately engineered by financial incentives from the EU, regional and national administrations to reduce pressures on built-up areas and regenerate areas of declining population. The 'democratisation' of remote forms of mass communication (ICT etc.) also plays a part in re-establishing the viability of rural, semi-rural and some remote areas. This too is policy led.

The need to restore cohesion in Europe by re-building social and cultural integration is faced head-on by the 2010s with serious efforts to seek solutions to the challenge of religious and, racial diversity which appeared to be the source of much conflict. The largely media-driven absorption with individual identity is tackled through shared cultural events and activities designed to cultivate shared regional and European identities. Citizenship and language classes become a residency requirement and restrictions on religious schools is complemented by interventions to circumvent the segregation of minority groups with, for instance quotas set for the children of ethnic and religious minorities and the facilitation of inter-cultural interaction from an early age through educational exchanges etc. While assimilation is not forced, such 'soft' measures encourage more peaceable co-existence and sew the seeds for long-term integration of disparate communities. Early indications show that the integration of 2nd and 3rd generation immigrants from Asia, Africa, the Middle East and Latin America into the host communities is improving, especially with young people. A slight rise in inter-racial marriage appears to be a positive side effect of this policy. While the detail of policy provision to seek socio-cultural integration is generally devolved down to lower levels of regional and local administrations, there are exceptions. The situation of particular minorities who have experienced discrimination is of concern and protective measures from the EU and Council of Europe are enacted. The emergent nationalism in some areas which feed these problems also continues to be a source of concern and the policy of a 'Europe of Regions' is being actively promoted to try to contain it, with special status and provisions for minority groups which have no territorial base and are geographically disparate, such as Jewish and Romany groups.

Economy and technology

The macro-economic context in which the renewed cohesion policy is launched is similar to that of the baseline scenario. Globalisation is still accelerating and external competition from large emerging economies (China, India, Brazil) encompasses more and more high-tech products and not only products dependent on a cheap labour force. Both processes also impact the agricultural sectors (following WTO decisions) and service sectors. Energy prices, particularly oil and gas, are steadily increasing, reducing the profitability of energy-intensive productions in Europe, as well as the competitiveness of the most transport-dependent regions (mainly the peripheral ones). The gap existing between Europe and other advanced economies (USA, Japan) in terms of growth rates and technological development remains significant and the Lisbon Strategy, despite its renewed boosting in early 2005, is not efficient enough to reverse the trends. After the accession of 10 countries in May 2004, only Bulgaria and Romania become new members of the EU in 2007. The decision has been taken not to continue the enlargement process. Turkey and the Western Balkan's states only have the Status of "neighbouring countries".

A major difference with the baseline scenario is to be found in public policies addressing balanced regional development and territorial cohesion. Maintaining and even strengthening the EU cohesion policy is the result of both the EU enlargements and of a reaction to the territorial imbalances generated by accelerating globalisation in the early 2000s. Preserving

the vitality of less favoured regions appears as a fundamental long-term objective, because the economic and social costs of devitalised regions are, in the long-range, extremely high. On the other hand, this collective attitude does not ignore the requirements of competitiveness. The new cohesion policies include numerous measures aimed at increasing the competitiveness of the less favoured regions and avoiding their marginalisation with regard to globalisation trends. As a renewed and strengthened cohesion policy is also more expensive, EU budgets have to be correspondingly adapted and various resources diverted towards the cohesion policy. The CAP, the transport and the RDT policies are consequently being adapted to give prioritised support to less favoured regions. Further liberalisation of public services is not envisaged, because it would be harmful for less developed areas where such services aren't profitable. It is considered that the closing down of such services would be damaging for the demographic and economic evolution of these areas.

In the renewed cohesion policy, emphasis is put on efficiency-oriented support to the less developed regions. This support concentrates on preparing them to attract external investments and to enhance the opportunities for development of their own firms; on giving priority to the development of transport links between these regions and the core nodes of their countries, and also on strengthening the networks of business and research cooperation with the stronger regions. This support also concentrates on assisting the localities and companies which had already demonstrated their ability for restructuring, development and competitiveness. Unconditional assistance to territories, channelled only because they are adversely influenced by history and rules of competition-driven economic development, is of lesser importance. This assistance concerns mainly support to the improvement of the environment and of some basic facilities, such as water supply and treatment of sewage water, electricity supply, waste treatment etc. Cohesion policy at the European level is strongly related to the idea of maintaining the European "social model". Considerable spending for cohesion purposes is taking place. Furthermore, the deepening of European integration brings up a great number of new regulations at the EU level, e.g. in terms of environmental and consumer protection, which lead in turn to growing costs both for public budgets and for businesses.

Although there are similarities with the baseline scenario in the field of technological evolution, differences do exist in the regional patterns of innovation. In addition, various EU regulations are enacted to guide technological developments and their impacts more efficiently. Cohesive development implies, for instance, that consumer protection also becomes stronger at European level. As far as green biotechnology is concerned, gene-modified production indeed evolves, but within different regulation frameworks, at the European as well as at national level. At EU level, strong regulations are being set into force designed to avoid the contamination of certified GMO-free crops. Regarding red biotechnology, European or national policies intervene with regulations in research and development for gene-based technologies (such as of gene-tests, stem cell research, cloning etc.).

Support for technological development is concentrated on less-favoured regions. In terms of ICT infrastructure development, progress is made with the dispersion of broadband infrastructure into less densely populated regions. A supply-side improvement of broadband access in disadvantaged regions fosters the demand for internet services delivered by broadband, e.g. by the establishment of e-learning opportunities for citizens and employees in less densely populated areas and by offering e-government solutions. Also, policy actions and initiatives aimed at strengthening development poles in disadvantaged regions, contribute to improving and increasing the mobility and skills of the regional workforce. The digital divide tends to become smaller, and regional disparities decrease in European countries, as a consequence of European policies such as these. In the field of grey biotechnology, peripheral regions benefit significantly from the support of structural funds for environmental engineering (water treatment etc.). More generally, European and

national policies follow a strategy towards encouraging researchers and SMEs in less favoured regions, to enable their participation in innovation processes.

Smoothed maps based on MASST results: cumulative growth (left) and change in relative position (right) - 2002-2015 – Difference between the cohesion-oriented and the baseline scenario

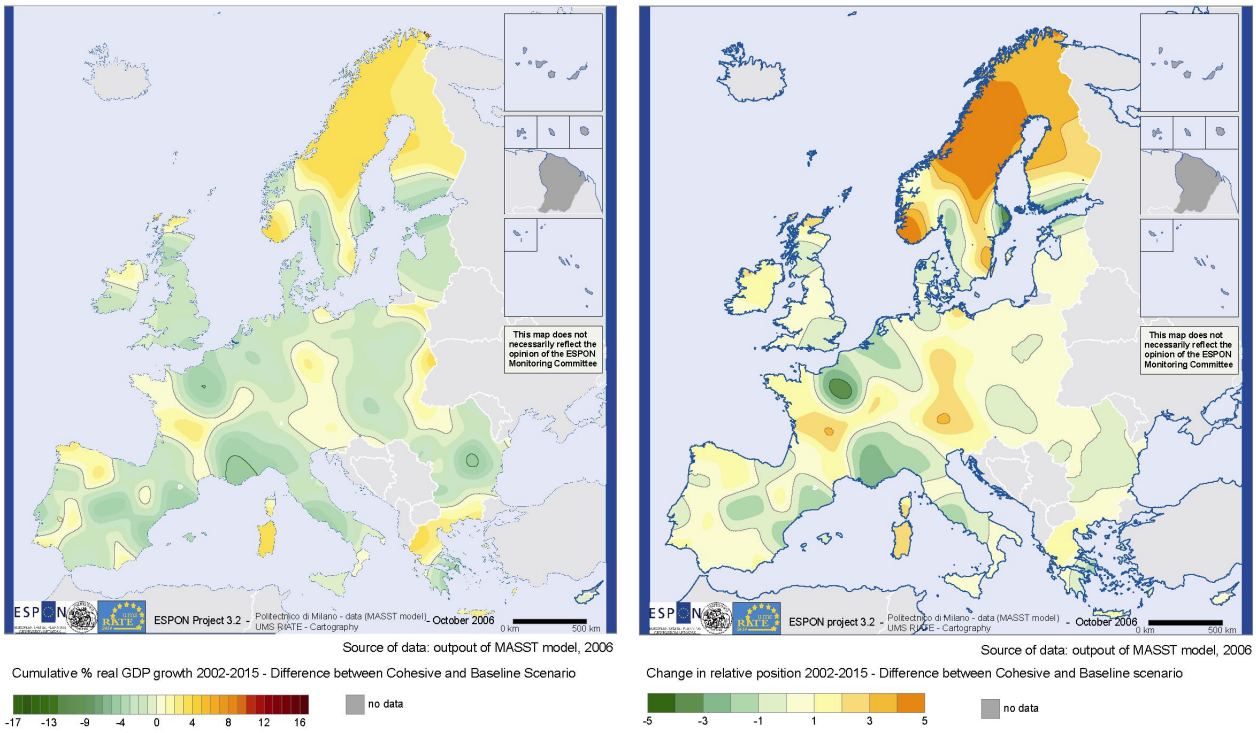


Figure 23 Smoothed maps based on MASST results: cumulative growth (left) and change in relative position (right) - 2002-2015 – Difference between the cohesion-oriented and the baseline scenario

In global terms, the cohesive scenario is less expansive than the baseline scenario. A lower GDP growth rate is registered up to 2015 for the EU as a whole, but it is significantly lower for the EU15 countries than for the New 10 countries (as well as Bulgaria and Romania), although these countries show also a lower performance than in the baseline scenario. The difference is however more contained than in the EU15. The epicentre of growth moves towards South-Eastern Europe, a tendency witnessed by a greater performance in Eastern Germany, Austria, Hungary, Greece, part of central and southern Italy. Fragmentation of relative growth rates in Eastern European countries is limited, while a more fragmented territorial picture characterises EU15 countries.

In general, the cohesive scenario provides a more diffused development, especially in rural regions, peripheral regions, and regions with a medium-low income level. The periphery of Europe grows more than in the baseline scenario: Greece, Sardinia and Corsica, various regions of Spain, Northern Ireland, the northern part of the Irish Republic and all Scandinavian countries. However, not all disadvantaged regions are experiencing an economic upswing. The approach consisting in concentrating policy support in locations within disadvantaged regions where a certain minimum of innovative capabilities, social capital, and sectoral concentration already exists, leads to a growing differentiation between the disadvantaged regions. The strongest among them experience an upswing whereas the rest continues to lag behind. In terms of change in relative position, the winning regions

are generally non-metropolitan regions of the periphery or located within or at the proximity of the Pentagon. The areas showing the highest differential in GDP increase in per capita with respect to the baseline scenario are regions belonging to Central Europe (Eastern Germany, south-eastern Bavaria, Austria and Trentino and Süd Tirol in Italy) as well as most Swedish regions.
Compared with the baseline scenario, metropolitan areas are less favoured, both in Eastern and Western Europe. This does not mean, however, that they do not progress in absolute terms. In the cohesion countries metropolitan areas and other large agglomerations are significantly supported, both in terms of infrastructure and of technological endowment. A major difference with the baseline scenario is, however, that small and medium-sized towns in less developed regions are more strongly supported, especially as far as services of general interest are concerned.

After 2015, the picture is more uncertain. The long-term continuation of a strong cohesion policy will very much depend upon the resources which can be allocated to it. As the global growth rate generated by the cohesion scenario is rather modest, it can be questioned whether a sustained cohesion policy is realistic for the long-term. It is not unlikely that the process of territorial differentiation between metropolitan and non-metropolitan areas shown in the baseline scenario takes over after 2015.

The progress of territorial integration and co-operation is quite different to that of the baseline scenario. Border regions within Western Europe, especially the wealthiest ones, receive much less support from EU border-specific support schemes. The support is more focused on the weakest border regions, thus on those of the periphery. However, the results are ambiguous (weak potential for cooperation because of lack of businesses and low population density). Some progress is reached though in regions where a minimum of characteristics is present. In a number of cases, the potentialities of the border situation can be exploited with EU support. But serious problems arise along external EU borders since regions bordering neighbouring countries which were denied EU membership face barriers which hamper potential welfare development.

Rural areas benefit from stronger support through the cohesion policies and from stable support of the CAP. The CAP budget is broadly maintained while resources are shifted from Pillar 1 to Pillar 2. The structural funds are concentrated on improving the socio-economic viability of marginalised rural areas in all member countries. Improving landscape and nature is also an important priority. In addition to the growing awareness of the environment and the priority given to territorial cohesion after the enlargement of the EU, other exogenous factors become important for the evolution of agricultural production. Consumers become more and more aware of the possibility of steering production in the direction of organic farming and regional and other quality products through their spending behaviour. In response to consumers, the coexistence of two farming types develop; cautionary measures in order to avoid the contamination of GMO-free crops are being taken and specific policies to ensure a certification and labelling due to coexistence are established. Technological innovations lead not only to higher agricultural production but also to reduced pollution and reduced water-use for irrigation. Rising energy prices stimulate the building of sustainable agro-production parks and lead to a growing demand for energy crops.

A basic difference with the baseline scenario is that intensification and scaling-up of agricultural production are moderated by the continued, if lowered, protection against the world market, by the regulation of the internal market and stronger regulation in the field of environment etc. Large-scale agriculture increases most in rural areas with low land-prices in Poland and the Baltic States; in North-West and Southern Europe large-scale arable and diary farming decrease. Many intensive cattle farms and horticulture settle in agro-production parks, mainly in the pentagon. Clustering reduces production costs and provides

possibilities for recycling manure, waste etc. Regulations for animal welfare limit intensification. Experience farming breaks through in metropolitan areas and in rural areas with small-scale landscapes in Eastern and Southern Europe. The increased and intensified regional development policy (RDP) programmes facilitate farmers' professionalism. The growing demand for cultural landscapes provides opportunities for agrarian nature and landscape management, particularly in small-scale landscapes. RDP programmes let subsistence farming in the peripheral regions of the CEECs almost completely disappear. The process of economic diversification of rural areas is much stronger than in the case of the baseline scenario. In the fertile areas of France, Germany, and Poland, agricultural production further modernizes. In these areas, food production competes strongly with the production of energy crops. In Eastern and Southern Europe rural areas, stimulated by RDP and the structural funds, become economically more diversified. Both types of rural areas become more socio-economically viable. In Western as well as in Eastern Europe there are a decreasing number of rural areas experiencing marginalisation and abandonment. These are rural areas where the demographic situation (high level of population ageing), the production conditions (low level of soil fertility, increasing drought) and the attractiveness are very unfavourable. Despite all efforts the socio-economic viability of these areas lags behind. Urban-rural relationships and partnerships intensify more in rural areas, and around medium-sized and small towns than in more urbanised regions around metropolitan areas, than is the case with the baseline scenario.

Transport

Transport policies in this scenario are more oriented towards cohesion and sustainable development than in the baseline scenario and market demand is less of an unavoidable criterion. Significant financial resources from the Regional and Cohesion Funds are allocated to the development of transport infrastructure in the cohesion countries and in the less developed regions. A main priority is the development of efficient transport infrastructure on major corridors in the new member countries as well as between the new member countries and the EU15. A difference with the baseline scenario is that, in addition to major corridors, support is also given to a number of strategic regional transport axes in the context of rural development plans, so as to connect as many medium-sized and small towns as possible to the trunk networks. The cohesive scenario pays also greater attention to a better balance of transport modes and promotes significantly efficient railway and waterway systems. In the countries of Central and Eastern Europe, obsolete railway systems are being modernised, in order to limit the growth of road and motorway traffic, a policy which takes also into account the constraints of oil price and oil supply.

With regard to investments in rail transport infrastructure up to 2030, the regional pattern is dominated by the construction of HST lines and by the construction and modernisation of conventional railways. The most favoured regions are those of the Iberian Peninsula, France, northern Italy and Slovenia, Czech Republic, Slovakia, southern Norway and adjacent Swedish regions, northern Poland, Lithuania and Latvia. Noticeable investments are also made in southern Italy, northern Greece and in various regions of the Benelux and Germany. The pattern of investments in motorways and roads is rather different. Although such investments also favour the Iberian Peninsula and southern France, they are also very significant in Central and Eastern Europe, especially in the Czech Republic, Slovakia, Hungary, Romania, Bulgaria, the Baltic States, southern Poland and in a number of peripheral regions of Western Europe, such as Ireland, northern Scotland, southern Sweden, southern Finland, Corsica, Sardinia, Sicily, Greece and Cyprus.

In terms of Europe-wide accessibility measured by transport costs, the regions more favoured than in the baseline scenario are mainly, the regions of the pentagon, a number of more peripheral regions such as western France, the western regions of the Iberian Peninsula, most regions of the UK and Ireland, Corsica and Sardinia, most Polish regions

and, to a lesser extent, regions of southern Scandinavia, Bulgaria, Greece, Lithuania and Latvia. A more economy-related measurement of accessibility (to GDP in less than 10 hours) in 2030 reveals a somewhat different pattern, with regions benefiting most being those of the Iberian Peninsula, southern France, Hungary, Slovakia, Bulgaria, northern Greece, northern Sweden and northern Finland. The more central regions of Germany, eastern France and the Benelux countries benefit less of accessibility improvement than in the baseline scenario.

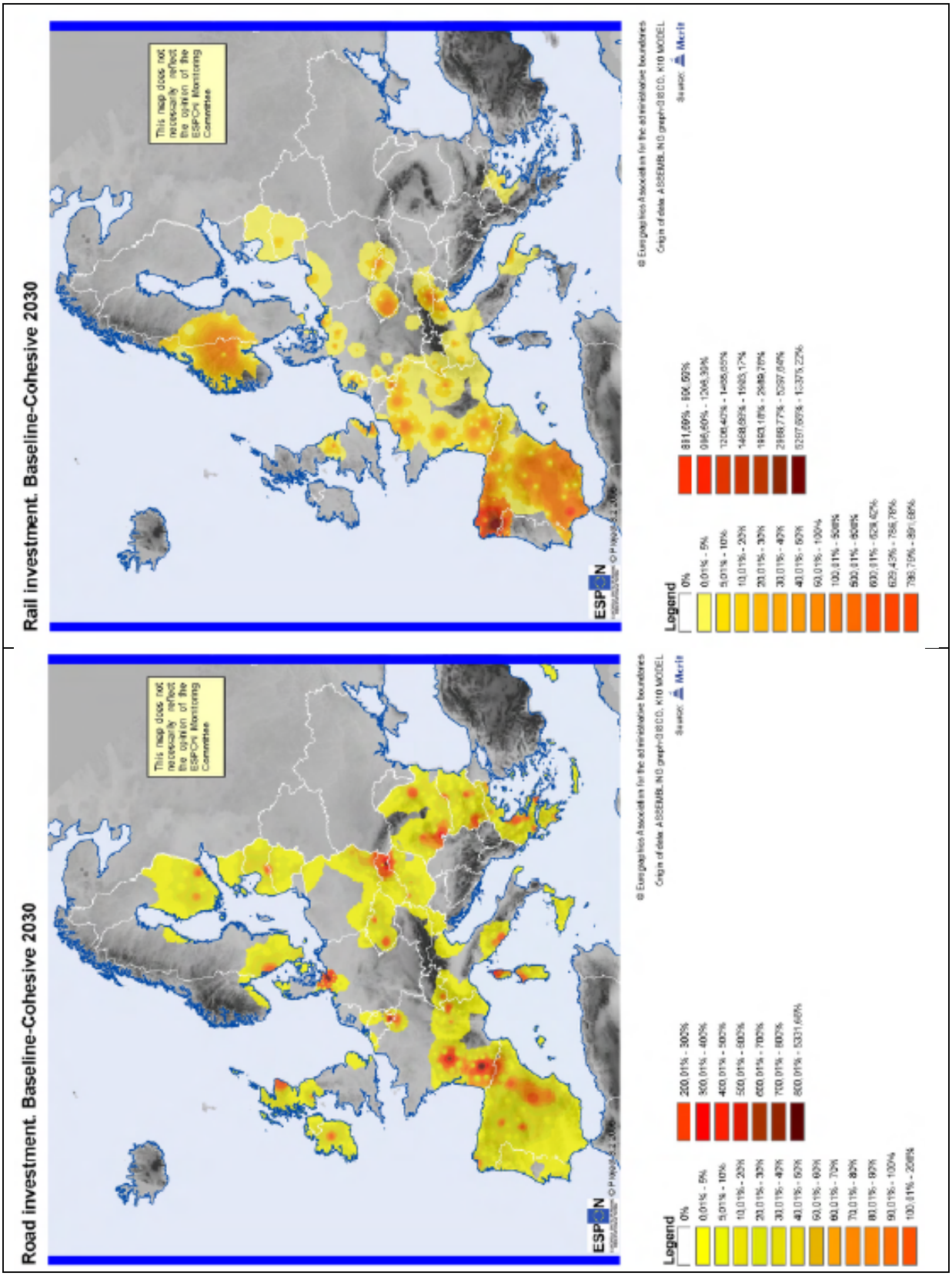


Figure 24 Rail and road investment until 2030 – Difference between the cohesion-oriented and the baseline scenario (KTEN Model)

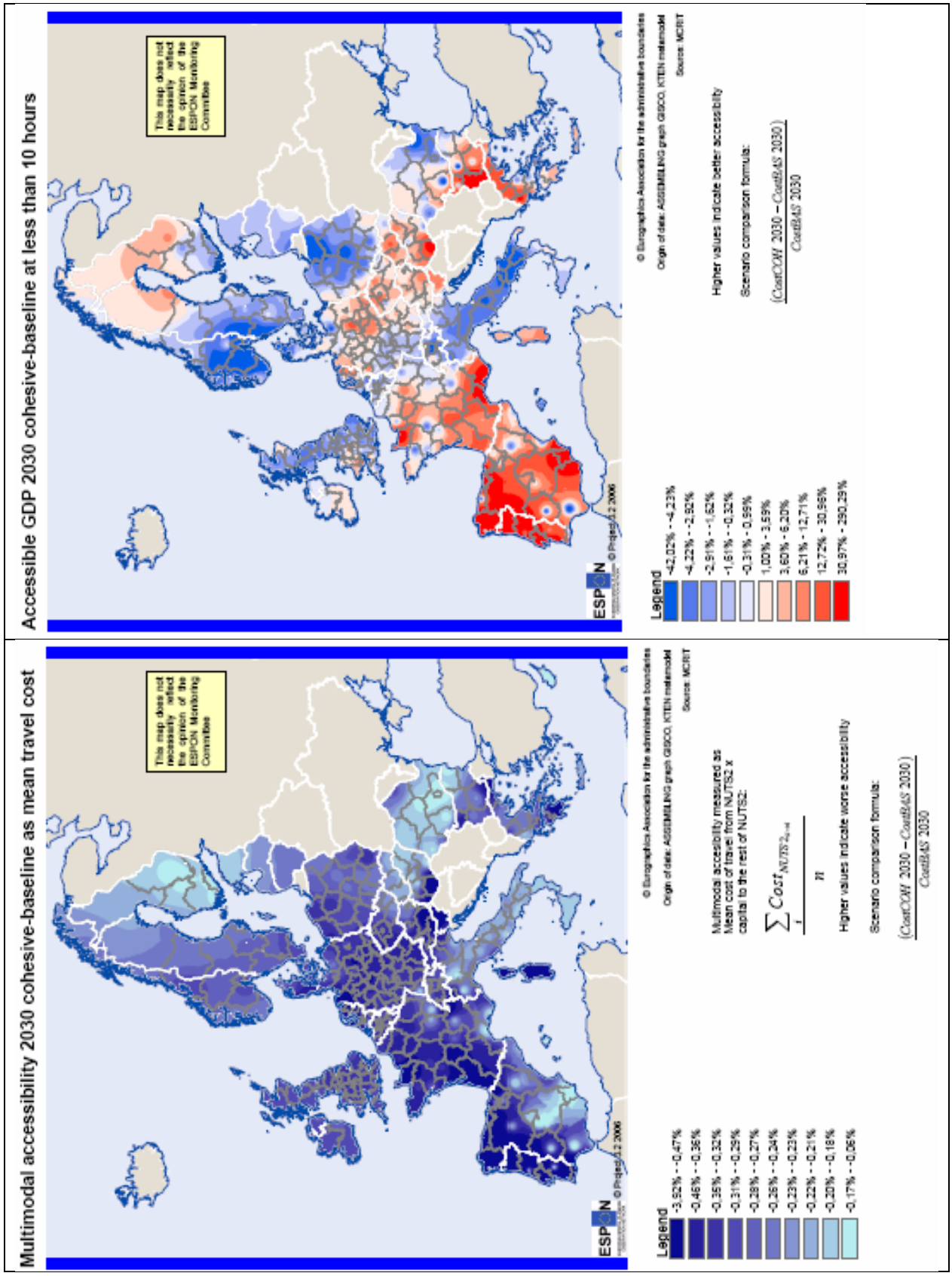


Figure 25 Multimodal accessibility as mean travel cost (left) and accessible GDP in less than 10 hours – 2030 – Difference between the cohesion-oriented and the baseline scenario (KTEN Model)

The regional pattern of CO2 emissions (figure 26) is less favourable than in the baseline scenario in most European regions, because the cohesive scenario generates more global traffic than the baseline scenario. The regions more severely affected are those of Bulgaria and of Greece as well as, to a lesser extent, most regions of the pentagon, of the UK and Ireland, of western France and northern Spain and most regions of the Nordic countries. In terms of environmental footprint, the cohesive scenario is more favourable than the baseline scenario in central and eastern Europe (except Bulgaria) and in southern Spain

CO2 emissions due to interurban road traffic. Cohesive-Baseline 2030

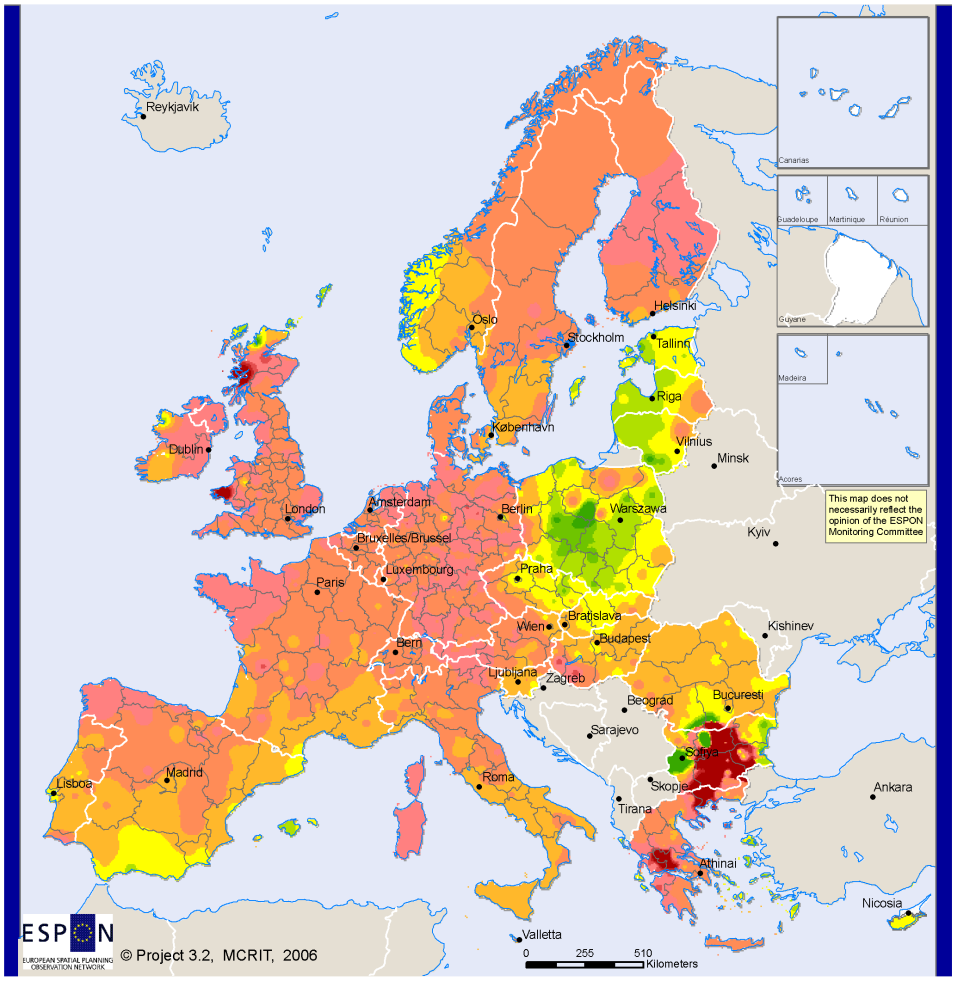


Figure 26 CO_2 emissions (T/Km2) - 2030 – Difference between the cohesion-oriented and the baseline scenario (KTEN Model)

Energy

The basic factors leading to the new energy paradigm are the same as in the baseline scenario: increasing oil and gas prices, progressive depletion. A difference is however, that structural policies pay a greater deal of attention to energy issues and allocate a higher amount of resources in eligible regions to support measures of energy savings and of diversification of energy supply sources. The TEN-E are further developed, but mainly to the benefit of less developed countries and regions (Central and Eastern Europe, European peripheries). The Rural Development Policy also allocates substantial resources to the production of energy in rural areas. Energy systems are modernised more in less developed regions, benefiting more from structural support than richer regions with metropolitan areas. In this respect, the catching up process of the new member countries in the energy supply and energy transport sectors is significant. Obsolete energy systems are rapidly replaced by more modern ones, including renewable energy sources. Decentralised systems of energy production and distribution are developing, encompassing rural areas together with their small and medium-sized towns. The external energy dependency of such regions is reduced and energy production is at the same time a new source of income for farmers and rural areas in general, a factor which stabilises rural economies in a period of further liberalisation of agriculture with related stronger external competition.

As technological research is not sufficiently supported by EU policies, new breakthroughs in energy technologies are not taking place. The hydrogen technology and its applications progress only slowly, as the mass production of hydrogen remains very expensive. Coal gasification has reached maturity. In order to match the energy needs of urban regions, nuclear energy is maintained at a low level.

In the cohesive scenario, the negative impact of higher energy prices is felt more strongly than in the baseline scenario, because it can be compensated for less by other factors of growth. The move towards a more intangible economy is less rapid. More investments are made in intermediate technology sectors, especially in less developed regions. But Europe is increasingly competitive in sectors related to renewable energy technologies. A number of regions, not necessarily in the pentagon, take advantage of this evolution and develop significant amounts of exports towards other European regions and also towards non-European countries.

Like the baseline scenario, settlements become more energy efficient and urban policies favour a better integration of urban functions generating less mobility. As no significant technological breakthrough takes place which is likely to diversify the energy supply of urban and metropolitan regions, solutions are sought in energy savings and in the revival of traditional energy sources such as coal, with the application of new technologies like gasification. In the context of the cohesive scenario, the new energy paradigm favours rural areas more than urban regions. The strong promotion of renewable energy sources creates wealth in rural areas and counterbalances the decline of a number of traditional weakly competitive agricultural activities. Solar and wind energy as well as the production of energy crops enable the creation of decentralised energy supply systems which also benefit to small and medium-sized towns, making them less dependent upon external energy supply. In the context of a liberalised energy policy, new regional energy production and supply companies emerge, competing against each other to the benefit of energy consumers. In the countryside, numerous farms are becoming energy self-sufficient. EU structural and rural development policies play a major part in making the new energy paradigm favourable for less developed rural regions, especially in the new member countries and in other peripheral regions.

The progressive change in the energy paradigm brings with it both positive and negative aspects in relation to the quality of the environment. In urban regions and metropolitan

areas, despite energy savings and the introduction of environmentally-friendly technologies (hybrid cars) which contribute to improving the quality of the environment (air quality, noise level). In rural regions, the higher level of energy self-sufficiency does not automatically mean that the environmental quality is being improved overall. Wider use of solar energy and of biomass and bio-fuels certainly contributes to the improvement of the environmental quality. In the case of wind energy, both positive and negative impacts to the environment are being generated. Despite the adoption of new regulations, damage to natural and cultural landscapes cannot be excluded. The mass production of energy crops may also endanger the environment. On the other hand, the protection of forests and the development of energy crop cultivation contribute to the production of biomass, whilst maintaining agricultural and forestry activities and preserving traditional landscapes.

Environment

In the cohesion scenario, the environment is viewed as one of the main pillars of European solidarity. Environmental targets are set at a higher level than in the baseline scenario and a significant amount of resources from the Structural Funds and Rural Development Policy is allocated to environmental improvement and protection in less favoured areas. As far as water resources are concerned, the level of water stress is lower than in the baseline scenario thanks to a combination of a strict implementation of the Water Directive and the targeted use of funds to build and maintain a sustainable water management system. Examples of measures implemented are investments in water-saving irrigation techniques in Southern Europe as well as in desalination plants and changes in agricultural production with the cultivation of less water-demanding crops. This does not preclude a rise in water consumption in certain sectors, such as the water consumption of households in the new member countries. The policy decisions taken in the cohesion scenario also have tangible results on the changing quality of water in Europe. In rural areas, policies concentrate on halting nitrate diffusion; this requires more cautious use to be made of fertilizers, and blocks the expansion of agriculture in areas with high nitrate levels. Farmers are urged to find new ways of fertilizing and to recycle the surplus of manure from their cattle farms. As a result of these efforts, pollution levels of European rivers decrease substantially, particularly in traditionally polluted areas like industrial zones and urban fields, but less so in areas of intensive agriculture. Eutrophication remains a problem in most of Central and Western Europe, although not as much as in the baseline scenario. With regard to the risk of flooding, significant resources from the Structural Funds are allocated to prevention measures. As a result, riverbeds are reshaped, emergency water retention areas designated, and restrictions imposed on building in areas that would cause unacceptable levels of runoff. In 2030, although river discharge has increased in Northern and Central Europe, the actual damage of flooding is little more than in 2005, and much less than in the baseline scenario. Most river landscapes have been transformed into wide semi-natural river plains.

Stronger attention paid to environmentally-friendly transport modes and related investments, especially in railways, tend to reduce the environmental footprint of the transport sector and to contribute to the improvement of air quality. Kyoto implementation is also taken very seriously by the EU, which translates itself into more rigorous source-based controls for industry and transport and the promotion (subsidization) of environmentally friendly practices. More attention is paid to the protection and enhancement of the natural and cultural heritage than in the baseline scenario. In less favoured areas, significant resources from structural fund monies are allocated to the enhancement and protection of natural areas and to the implementation of Natura 2000. Important efforts are made in Southern Europe to prevent forest fires through better forest management. Stronger rural development in European peripheral regions favours the maintenance of cultural and natural landscapes as a resource for rural tourism.

4.1.4 Territorial image of Europe by 2030

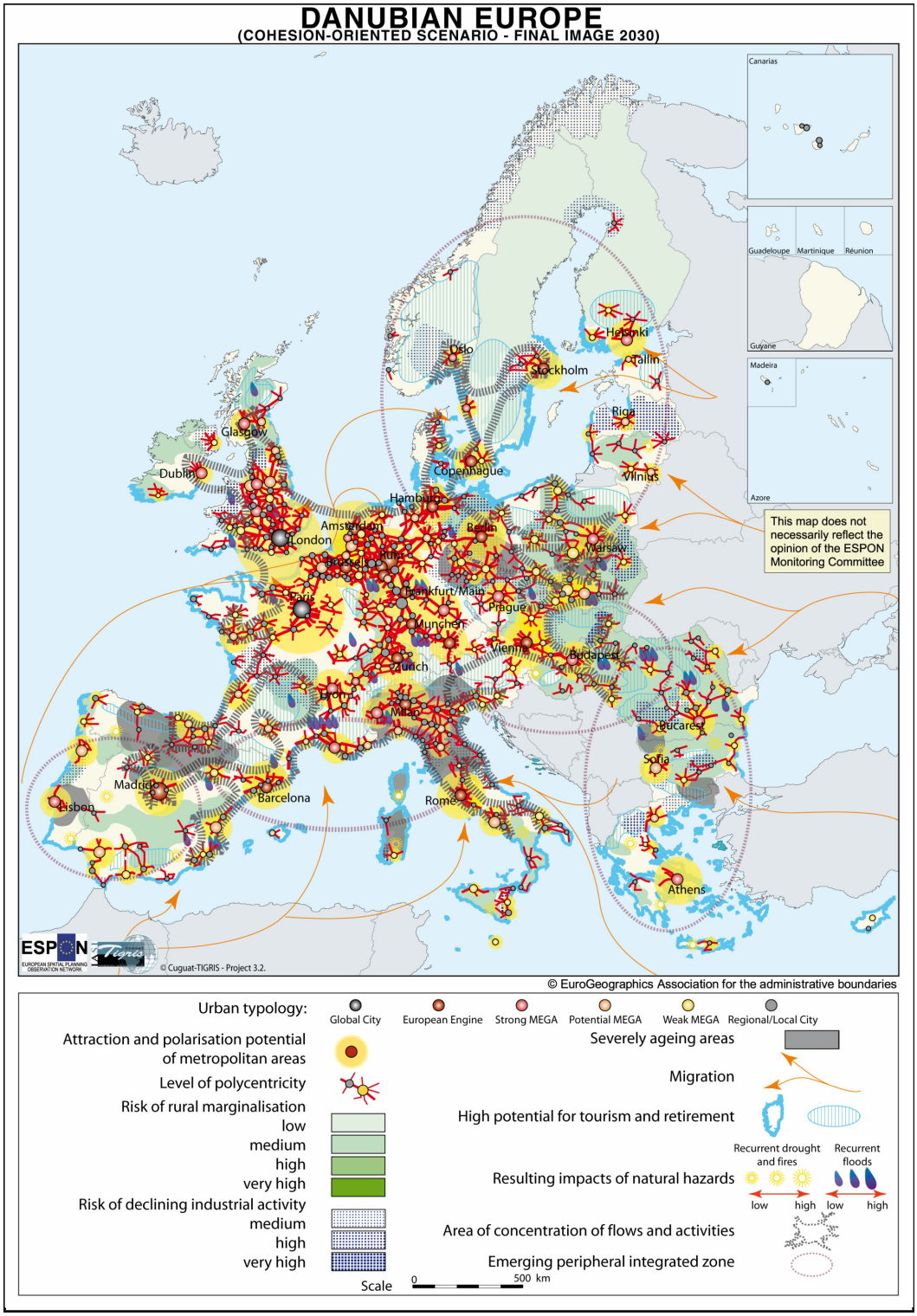


Figure 27 Schematic map of the final 2030 image of the cohesion-oriented scenario

The map reveals a less concentrated, but more widespread pattern regarding ***attraction and polarization potential of metropolitan areas in 2030***. Urban settlements are characterized by a more ***polycentricity***, stretching over larger parts of the territory than in the baseline scenario. The number of areas **at *risk of marginalization*** and of ***declining activities*** is comparable to that prevailing in the baseline scenario, but their size is reduced and intensity lower. The *areas* ***with high potential for tourism and retirement*** as well as those with ***severe population ageing*** remain similar to the baseline scenario. The resulting ***impacts of natural hazards*** (drought, fires, floods) are much lower than in the baseline scenario. Another basic difference with the baseline scenario is the emergence of **several *peripheral integrated zones***. The ***area of concentration of flows and activities***, the successor of the former pentagon of the early 2000s, has a wider reach than in the baseline scenario and includes a larger number of cities in the close peripheries.

Compared with the baseline scenario, the territorial image for 2030 reflects a stronger impact of demographic development. This development results from more pro-active demographic policies and a weaker impact of global economic development, because more equalitarian policies are less favourable to global competitiveness and therefore the EU attracts less immigrants. The dichotomy in long-term growth processes observed in the baseline scenario between metropolitan and non-metropolitan areas is less apparent in the cohesive scenario, at least up to 2015/2020, especially in the cohesion countries where rural areas are strongly supported.

Urban Europe

Compared with the baseline scenario, the competitiveness of European metropolitan areas has progressed less significantly, both in Western and in Eastern Europe. The gap between European metropolitan areas and global cities of North-America and Asia has increased. The expansion of the pentagon along major corridors is less strong. The development of networks of cities supporting wider integration areas is more modest. Polycentricity at the European scale has not progressed, as no alternative global integration area has emerged. Peripheral and/or rural regions have been more successful in generating development. At intermediate scale, the level of polycentricity in the national urban systems of the countries of Central and Eastern Europe has declined less significantly and in some cases the revival of medium-sized cities has made it possible to efficiently counteract the attraction of capital and other large cities, especially as far as rural-urban migration and the location of SMEs are concerned. In western rural and peripheral areas, towns have benefited more from out-migration flows generated by large cities (retirees, self-employed) and from tourist and other activities. A substantial difference with the baseline scenario is the evolution of urban systems at the local scale under the effect of the social cohesion and integration policies. The efforts developed in the field of economic, social, educational and the cultural integration of ethnic minorities and other less privileged groups have contributed to limiting social and physical segregation in cities and the resulting feeling of insecurity. The 'better offs' are less inclined to move out of cities and to contribute to strengthening suburbanisation. Gated communities are not emerging and the originally less favoured population groups are better integrated into the labour market. The impact of increasing energy price on the evolution of settlements is however similar to that in the baseline scenario. Generally, it favours more the evolution towards compact cities and it is much less counteracted by suburbanisation trends resulting from insecurity and from high real estate prices in cities, as the growth of metropolitan areas is less significant than in the baseline scenario.

Rural Europe

Compared with the baseline scenario, the evolution of rural areas is more positive. Strengthened structural funds and rural development policies have contributed to accelerate the process of economic diversification in numerous rural areas. The dichotomy between strongly growing rural areas located around metropolitan areas and large cities and the more remote and declining rural areas is more modest, since metropolitan areas are not growing as fast and remote rural regions are more strongly supported. This does not exclude the existence of a variety of situations and dynamics. Despite significant support from public policies, a number of remote rural regions are facing decline and depopulation. As in the baseline scenario, changes have taken place, by 2030, in agricultural systems. The strong dichotomy between areas with intensive agriculture and areas with low productivity agriculture, shown by the baseline scenario, is attenuated in the cohesive scenario by stronger control of the environmental impacts of agriculture and by stronger rural development policies in peripheral and remote rural areas. The increasing impacts of market forces in agriculture and the development of the production of energy crops have however favoured highly productive agriculture in fertile areas, especially in North-West Europe, Poland, northern Italy etc. The negative impacts of climate change on rural regions in Southern Europe are much less strong than in the baseline scenario, because support is allocated to adaptation measures of agricultural production (water-saving irrigation techniques, changes in types of productions etc.), to forestation, to the preservation and development of cultural landscapes. Less agricultural areas are abandoned because of drought and pressure on agricultural and rural areas in the central and northern European regions increases less dramatically. Generally, the natural and cultural heritage of European rural regions is better protected and enhanced than in the baseline scenario.

4.1.5 Territorial images by 2030 in the European macro-regions (by comparison with the baseline scenario)

Atlantic Area

Overall the population grew modestly in the years up to 2015 but began to stabilise thereafter, mainly as a result of curbs to external migration. The prospects for the age distribution of the Atlantic Area began to look more balanced towards 2030 following investments in covert pro-natalist policies, which together with more flexible child care arrangements began to encourage a partial return to larger families. Pressures on isolated nuclear family units and individuals were also tackled with innovative and accessible communal amenities designed to recreate extended family support networks in surrogate form. However global instability and rising birth rates in neighbouring North Africa and Turkey have led to growing allegations of a 'fortress Europe'. This has become diplomatically difficult for the Union as ever more daring attempts to enter the EU taking the sea route have impacted the Atlantic coastline and made it the focus of the international media. Problems arising from of socio-cultural divisions evident in most of the metropolitan regions during the first decade of the century have also proved fairly intractable in some areas; with community leaders and parents resisting attempts to integrate schools by introducing quotas according to ethnic origin and religious identity. In smaller settlements and new suburbs this has been less of a problem and in the further and continuing adult education sectors, measures to integrate 2nd and 3rd generation migrants have been moderately successful; instances of inter-racial marriage for instance, one measure of this, have been rising since 2015.

Improved socio-economic redistribution in the Atlantic Area from 2007 has resulted by 2030 in the maintenance of some of its weakest regions, and contributed indirectly to a process of decentralization. Policies included active measures to encourage diversification, direct support to numerous SMEs, including small farms and fishing enterprises, and backing for peripheral service infrastructures. Multi-service centres became a popular form of social infrastructure, as did small scale heritage projects all of which helped to retain populations in areas such as the Highlands of Scotland. A focus on quality of life issues, regional identity in EU expenditure decisions also helped the promotion of ultra-marginal areas and remaining minority Celtic populations.

Specific measures were supported by a broad strategy instigated by the EU in collaboration with regional administrations to build solidarity between coastal areas and their hinterlands. The development of 'hubs'; medium sized towns acting as service centres to integrate fragile and de-populating surrounding areas,[28] was promoted elsewhere along the Atlantic Rim. Working directly with regional bodies to build on complementarities between medium sized towns and retain the viability of interior regions, such as those in Galicia and Limousin, reinvigorated some formerly declining areas. These achievements in turn gave momentum to the devolving of decision making powers down from the national to lower levels of government and by 2030 the 'Europe of Regions' has become more of a reality. By the same token, the EU did retain a strong co-ordinating role in both economic and environmental policy spheres. This was used to promote new socio-economic development by providing incentives to business enterprises to invest in peripheral locations, addressing the issue of labour supply partially through the targeting of migration and re-location packages. With refurbished and new centres benefiting from a dispersal of economic activities, new, previously marginal areas were strengthened and the effects have proved cumulative with a greater emphasis on residential quality of life, away from what were becoming increasing congested core metropolises. The decentralisation process was supported by both flexible retirement and anti-ageist employment policies, rigorously promoted and implemented from the EU level downwards.

EU 'dispersal' policies were facilitated by their interventions in the transport and telecommunication spheres which have similarly served to reinforce the development of peripheral poles. This has gone beyond reinforcing connections between these poles and their old national centres; new routes along the Atlantic coast and their hinterlands have been opened up. Such investments were costly, controversial and lessened – not halted - the tide of the people and capital moving towards the original centres of economic strength. The policies did exploit the post-industrial trends of increasing mobility, remote working, low-density living and retirement to rural regions to the Atlantic Area's advantage. A more polycentric settlement pattern had emerged by 2030 in the region, positive in view of its geographic situation, however the greater demands on mobility of a de-centralised space continued to increase energy requirements and consumption substantially.

The de-centralisation of energy production and subsidisation of new renewable forms since 2007 have been of further benefit to remote and coastal regions, which have also been protected by EU investments in environmental hazard prevention. The consequent diffusion has been subject to sustained political controversy between 2015 and 2030. There has been resistance to the logic of and extent of the EU effort to disperse monies and maintain the most marginal of areas. There is also a degree of tension between the goals of cohesion and the environment, with for instance, the respect for the fishing resources regulation policy causing much deliberation in view of the potential negative impact on employment of imposing stricter quotas and the negative impacts on the environment of expanding aquaculture. Arguments about the relative value of renewable energy compared to nuclear power have dominated debates about energy production.

[28] This policy was pioneered in Ireland at the beginning of the century in an attempt to counter its monocentricism.

The impacts of climate change are much the same as in the baseline scenario, being driven largely by global developments; but the response to them has been better co-ordinated. Shared environmental risks and maritime safety have been tackled though strong support by the EU for forms of trans-national co-operation and regional and local governance. These have also been empowered through match-funding to give financial and organisational backing to innovative initiatives to utilising the unique potential of the Atlantic Area, such as research and development into currents, tidal power and other coastal renewable sources of energy, harnessing SMEs and higher educational establishments with larger business enterprises and funding bodies. Supported by tax incentives and subsidies, renewables did, by the end of the 2020s have the potential to compete with conventional energy sources. The prospects by 2030 for the region in terms of the longer-term future bio-diversity, landscape and economic self-sufficiency was dependent on which lobby proved most effective, as well as the success – or not – of international agreements.

Two development corridors had become established by the end of the period; one of these an 'Iberian Atlantic Zone' comprising a coastal system of Galica, the port of Lisbon, Seville, up to the cross-border Basque region, the second a 'North Atlantic Zone' consisting of an urban system connecting the Manchester-Liverpool conurbation with Ireland, upwards to Scotland, down to Bristol and the Midlands and providing connections onwards to Scandinavia and America. The relative improvements in territorial balance have, on balance, been positive for the region, helping to produce a virtuous circle of more social cohesion with less economic concentration; in this case one founded on the localisation of economies of scale.

North-West Europe

Cohesive policies being more favourable to peripheral regions than to metropolitan areas, North-West Europe has been performing less successfully than in the baseline scenario. The regions which have benefited most are rural (northern France) and the most peripheral ones (Northern Ireland, Wales and the north of Scotland). Cumbria and parts of the Walloon region have also gained ground. This does not imply, however, that these areas have overtaken the NWE metropolitan regions in affluence, since their starting position was much lower. In addition, the globalisation process and other market forces have continued to support the development of metropolitan areas. Despite the catching up process of less developed regions, disparities continue to persist until 2030 between metropolitan areas of the NWE core and more rural regions. Demand for new transport infrastructure has been less strong. Most new TENs have been realized outside the NWE area. Some additional investments in transportation in rural areas have nevertheless been carried out in order to improve accessibility, while the development of urban networks in the core area of NWE has been less pronounced than in the baseline scenario.

Regarding urban growth, the pentagon has hardly expanded along the major corridors. The global cities of London and Paris, and MEGAs like Amsterdam and Brussels, have attracted less people. Suburbanisation has still been progressing, but more modestly. Population ageing in the cities has progressed slightly more, since the volume of immigrants from outside Europe and from less developed parts of the EU has been more modest. The revival of fertility rates has also contributed to moderate the process of population ageing in urban areas. Even the cities in areas with traditional industries like the Ruhr area, northern England and Wallonia have experienced a demographic and economic revival, and are more populated than they would have been in the baseline scenario. Illegal immigration has continued but the figures have declined substantially after the introduction of the EU ID cards. The population of immigrant origin living in NWE has become better integrated in society and in the labour-market thanks to efficient integration policies. Citizenship and the

knowledge of the country's language have become residency requirements and inter-cultural interaction has been facilitated from an early age. Violent manifestations such as riots have declined. In the global cities of London and Paris and in other large metropolitan areas, including Brussels and Frankfurt, efforts in the field of the integration of ethnic minorities have contributed to limiting spatial and social segregation. 'No-go' areas and gated communities are not usual.

Rural areas have remained very heterogeneous in NWE. Those highly dependent upon agricultural activities (northern France, Bretagne) and the most remote ones (Scottish Highlands) have been more strongly supported. Basic infrastructure and services have been maintained or upgraded. The production of energy crops has proven beneficial to a large number of agricultural holdings which faced severe competition in the field of conventional agricultural productions from outside the EU. The demographic evolution in such regions has been by far less negative thanks to a revival of fertility rates. Rural areas around cities have been facing urbanisation pressure, not only around the largest metropolitan areas, but also around medium sized cities in the English Midlands, Belgium, the Netherlands and the Ruhr area. This pressure has been more limited however, partly thanks to policies aimed at reducing the pressure on densely populated areas and at regenerating areas of declining population.

Overall energy consumption has not significantly increased in NWE. Although more attention has been paid to renewable energy sources (solar and wind energy, tidal energy, biomass), this has not been significant enough to power large cities. As a result external energy dependency has increased and more use has been made of traditional energy supply systems (especially conventional power plants). Breakthroughs in hydrogen technology and coal liquefaction technologies have not really materialised, due to insufficient R&D efforts and investments. Rural areas have benefited more from renewable energy sources than large cities, both in terms of income and of energy supply. Rising energy prices have favoured compact cities but this has been counterbalanced by suburbanisation trends resulting from urban population growth and insecurity in cities (although less than in the baseline scenario).

Stronger priorities in the field of environmental protection and sustainable development have led to an improvement of environmental conditions, compared with the baseline scenario. Natural areas have been better protected and ecological corridors more efficiently introduced, particularly around areas of high population density, like the Ruhr area and Brabant. In rural areas, increased EU funds have enabled landscape management, promoting regional identities. Air pollution has fallen slightly in most urban areas. Compared to the baseline scenario, metropolitan areas show a sharper decline in air pollution levels, due to weaker population growth, and consequently less growth in transport volumes. Moreover, EU regulations are implemented more strictly, with penalties for those cities which do not comply with EU air quality standards. International treaties, like the successor to the Kyoto agreement, have been a catalyst for cities to embrace sustainable modes of transport and housing. Some factors have inhibited this evolution, however, such as the late emergence of less polluting transport and power generation technologies (hydrogen technology).

North Sea Region

The policy measures implemented in the cohesive scenario have been less favourable for the NSR than those of the baseline scenario. The most important economic drivers of the region, the port cities, largely showed signs of relative disadvantage. This has partly been compensated for by growth in more rural areas, but considering the relative importance of trade for the region, the overall picture remains inauspicious. In particular, Rotterdam, Antwerp, Bremen and Hamburg have been more negatively affected. A result is that there

has been less potential for improving the transport links between port cities, and consequently less attention has been paid to the development of multi-modality in the region, despite the objective of promoting sustainable development. Other economic activities, such as fisheries and agriculture have gained ground, as compared to the baseline scenario. In addition rural regions of East Anglia, Pennines and Yorkshire, northern Netherlands and north-west Germany are clearly performing better.

Population ageing has been slower and population decline in certain areas less intense because of a revival of fertility rates. Since authorities at EU, national and regional level have been implementing policies aimed at reducing pressure on built-up areas and regenerating areas of declining population, the difference between metropolitan and other areas has become smaller. As a result, MEGAs like Copenhagen, Hamburg and Amsterdam have attracted less people. The development of urban networks has been less strong. At the same time port cities like Hull, Newcastle, and Bremen, and medium-sized cities such as Bergen, Esbjerg, and Groningen have experienced a revival and have become more populated. Attractive rural areas have benefited even more from the location of retirees, self-employed people and tourism than in the baseline scenario, particularly rural areas along the coasts from the Strait of Dover to the Danish west coast and the south-west coasts of Norway and Sweden. The same is true for peripheral rural areas such as the Scottish Highlands, the inland areas of south-west Norway and the Wadden islands.

Urban development is more balanced throughout the region. Within large cities, social and spatial segregation has progressed less than in the baseline scenario, because of reduced pressure from external migrations and stronger efforts in the field of the integration of ethnic minorities. The population of immigrant origin living in the NSR has been better integrated in society and in the labour-market. In seaport cities like Hamburg, Rotterdam, and Antwerp violent demonstrations and riots have only seldom taken place. Xenophobia has decreased. The impact of increasing energy prices on the evolution of settlements has been similar to that of the baseline scenario. It has favoured more the evolution towards compact cities and has been much less counteracted by suburbanisation trends resulting from insecurity. The dispersal of settlements has also been more limited as a result of efforts to promote public transport systems and to better control land use evolution at regional scale. The promotion of renewable energy sources has helped compensate for the depletion of the North Sea oil and gas resources. As the NSR has some of the highest wind speeds in Europe, large wind parks have been developed. New technologies using tidal energy have been implemented too. Rural areas in the south (Flevoland, Groningen, Jutland) have benefited from the growing demand for bio-fuels. This has contributed to maintaining agricultural income levels in areas where conventional agricultural productions were hit by foreign competition. Nevertheless the external energy dependency of the NSR has been increasing.

The improved attractiveness of rural areas in the North Sea coastal regions (Dutch, German, Danish and English coasts) has revived interest in their recreational uses. These areas have not been exempt from land-use conflicts with respect to onshore wind parks. Stronger environmental legislation and a CAP focusing on rural development, diversity, and environment has been a major issue in agricultural policies. Agricultural intensification has taken place in competitive areas in the south, but within rather strict environmental limits. Rural development has been widely promoted in areas where economic stagnation and population decline was occurring, particularly Scotland. Efforts to connect peripheral regions to improved infrastructure have nonetheless led to the fragmentation of natural areas, especially in Scotland and Norway. The dichotomy between growing rural areas in urbanised regions, such as Norfolk, South Jutland and the Green Hart of Holland, and more peripheral rural areas, like the Scottish Highlands and the western part of Norway, has been more modest than in the baseline scenario. River systems have been adapted to increased flood frequency resulting from climate change. Large tracts of land along rivers have been

reserved for flood runoff. This has required substantial amounts of money, particularly in densely populated areas around the rivers Rhine, Schelde and the Elbe.

Northern Europe

The cohesion approach adopted by the EU after 2005 has a number of impacts in this region, though they are of course highly differentiated geographically, and in the less developed areas largely depend on absorption capacity. In the far north, the impacts are minimal as a rather stronger version of this particular 'policy mix' has existed in the Nordic countries for much of the post-war period, albeit with limited success and notwithstanding the fact that prior to 2005 the basic philosophy underpinning this approach was coming under increasing pressure within these countries themselves. Similarly, on the northern shore of the Baltic, in the more heavily populated areas of the Nordic countries (The Nordic capital regions) the impact of the cohesion approach is rather neutral, compared with the baseline scenario.

Inward migration to the northern-most parts of the region remains low, while fertility rates improve somewhat. It remains difficult however to maintain a 'gender balance' in most peripheral regions, as young women generally migrate southwards to the major urban centres, to fully benefit from the opportunities of modern life. In the Nordic capital regions, rising fertility levels fuel the spread of suburbanisation as space/cost ratios make city living for most average families prohibitively expensive. Meanwhile, in the south of the there has been a change in the trend of population decline that began in the early 1990s. But problems regarding the urban-rural balance remain, however, since little can be done to counteract the continuing historic move away from the land in countries like Poland, despite efforts made to develop rural areas.

Economically, the impact of the cohesion approach is again highly differentiated. In the north – a rather atypical 'peripheral' region - where, paradoxically, most people live in small urban environments rather than in traditional rural settings, the changes to the structural fund and CAP regimes and the focus on CEE 'catch up' bring little cheer. Similarly, in the southern capital regions of the Nordic countries – already groaning under the fiscal weight of cohesive 'equalisation' policies at the national level, but unlikely ever to be relieved of their dominant national economic positions – the EUs cohesion policy approach offers little that is new. The strengthening of the EUs territorial cohesion policy has a positive impact in Poland and the Baltic States. Continuing higher than EU-average growth rates, the impact of the drive towards 'catch up' and the positive demographic trends already alluded to above, stimulate economic improvements over the baseline scenario. It does however also slow the pace of agricultural restructuring, as CAP subsidies have enabled many people to remain on their small farms postponing a general restructuring of these countries' (Poland in particular) economies. In addition, the already polycentric nature of the Polish and Lithuanian urban networks benefit from the attempt to promote economic development in areas beyond the capital regions.

Energy price rises continually. The mix of nuclear power and alternative energy strategies premains dominant in the Nordic countries. Poland and the Baltic States, despite continuing investment in energy alternatives however remain largely dependent on the Russian gas distribution network, though even here, alternative approaches – such as the use of biomass – are utilised. The demand for additions (above the baseline) to the transport infrastructure in the Nordic countries is minimal in the context of the cohesion scenario, though in the southern Baltic the continuing process of long-term urbanisation necessitates further transport infrastructure construction – fuelled by EU support.

In sum, the cohesion scenario has little impact on the northern periphery and a slightly negative impact on the Nordic capital and other metropolitan regions in the Baltic Sea

Region, except for the Kaliningrad enclave. It does however have a positive impact (when combined with long-term patterns of rural-urban movements etc) on the southern shore of the Baltic, particularly and for rural areas in the short term,. The main feature here is the significant smoothing of the East-West divide. Moreover, the significant reduction in regional economic disparities makes it possible to start a long-term economic partnership based on co-operation between the two halves of the wider region, founded mainly on an exploitation of profitable knowledge and service industries. The southern shore of the Baltic Sea has thus also become both a dynamic demographic and a dynamic economic area. Given the rather significant spatial differentiation existing across the region in 2005, statistically speaking, by 2030 a measure of cohesion has been achieved, though this relates as much to the performance of the northern shore of the Baltic as it does to the level of performance shown in the south.

Alpine Space

Due to family-friendly policies in the EU member countries and in Switzerland, population ageing has been curbed in most regions of the Alpine Space. Improved child and health care facilities as well as better care infrastructure for the elderly have resulted in higher fertility rates and lower median ages in the urban agglomerations of the lowlands and rural centres in the Alps. Women have been able to better engage in work life, and flexible retirement schemes have led to a high activity rate. Although high investments were made in order to prevent remote rural areas from being abandoned, the process of ageing and population loss could only be slowed - but not be stopped - in alpine villages and small towns. Instead of migrating from rural villages to the agglomerations, young qualified job seekers have settled in rural centres. This has been accompanied by very restrictive migration policies that have permitted a minimum of qualified workers from non-EU countries to immigrate. Most of them were needed in the economic centres of the Alpine lowlands; only a small share has come to rural areas. Compared to the baseline scenario, the need for integrating foreigners has been lower in the larger cities but slightly higher in the rural centres. All in all, these measures have proved to be successful, and no major conflicts between residents and newcomers have occurred. Illegal immigration still exists but to a very small extent.

Following stronger decentralisation efforts, business development has been directed from the economic centres toward smaller cities, even in the Alps, provided that there is good accessibility. TEN-T has been realised, giving priority to peripheral regions including those along transit axes. Also many remote towns have benefited from competitive, but rural development-oriented public investment, in infrastructure and public transport. In the Alps, the construction of feeder roads and better public transport offers into the valleys has led to better cohesion and improved market access even in very remote areas. In addition, new jobs in industry, the supply sector, and service sector have been created in the more attractive Alpine centres. However, the urban agglomerations in the lowlands have kept their role as economic 'engines'. Compared to the baseline scenario, GDP growth has been stronger in regions like Tyrol, South Tyrol, eastern Austria and Vienna, the Aosta valley and in southern Germany. These regions have also been able to considerably improve their relative position in Europe. The per capita GDP has increased in comparison with in the baseline scenario, most of all in the East Alpine region, but has decreased in the southern and western part of the Alpine Space. This is also the case where GDP growth has been lower in general. The weakest development could be observed in the Sea Alps, Slovenia, and all over northern Italy, from Liguria over the Po Valley to Venice. Thus, Milan and Lyon have become less competitive than Munich and Vienna.

Globalisation has continued, including structural change of agricultural production. Compared to the baseline scenario, however, the CAP has given priority to pillar 2 funds. In the less developed regions, direct payments to farmers have been strengthened (pillar 1).Nevertheless, smaller farms have been abandoned for the most part or united into

regional cooperatives. In the Alpine regions, farmers have changed to labelled quality products and environmentally sound production methods, and more stringent animal health criteria have been applied. The area has also observed a moderate diversification toward subsidised landscape conservation and development, eco-tourism and biomass production. In the lowlands and Alpine foothills, the industrialisation of farms has also been slow. However, a concentration of agricultural production to increase efficiency has taken place. In addition, decentralised production of renewables like bio-fuels has been promoted due to rising prices for oil and gas. SMEs in the field of energy technology have settled in rural areas, mainly in central Switzerland (where businesses are less taxed than the EU) and Austria. Oil dependency has remained high, though alleviated in the Alpine Space by the more intensive and efficient use of hydroelectric power. The territorial development which has been more balanced in economic terms, has, however, led to increased mobility, particularly in peripheral regions. Thus, overall energy consumption has increased as well. High energy prices have shifted individuals and freight from private to public transport. Nevertheless, high mobility and longer transportation paths have resulted in worsened air quality and noise, dispersed all over the Alpine Space. On the other hand, these impacts are less dramatic overall and congestion has been kept to a minimum in the urban agglomerations.

Policies promoting rural areas have led to stronger settlement activities, or "rural sprawl" even in remote areas, thus – together with an improved road network – cutting through unique habitats. In some areas, this process has led to more monotony in the landscape and to environmental destruction fuelled by climate change: increased variability in precipitation (heavy rainfall / drought), storms, floods, and consequent erosion and landslides threatening human settlements in valleys. At the same time, measures aiming at improving environmental conditions have been strengthened, mainly through the establishment of regional natural parks that attract people from the cities as well as the nearby rural centres. Tourism has remained a main source of income in the Alpine Space despite mounting snow lines and shorter winter seasons.

Central and Eastern Europe

From 2000, but especially from 2010 onwards, total fertility rates began to increase in the eastern CADSES area. One of the reasons was better health care, the other improved facilities for child care. But even improving fertility and birth rates could not ensure maintaining the total population level, even less the level of active population. Nevertheless, they did encourage emigration flows to be gradually reduced. An important precondition was higher activity rates among older women, including those with grown-up children. In some eastern countries, welfare systems had seriously degenerated after 1990. A substantial change in their policies and the reconstruction of their social policies took place after 2005, though based on quite different principles than in the decades of "real existing socialism". Not only international migration, but also migration within individual countries slowed down. The improvement of infrastructure and accessibility ensured better living conditions in small towns and rural areas than in the baseline scenario, even in less developed regions in the east and in the peripheries. Natural population decrease could not be prevented in Bulgaria, Romania, Hungary and Italy, but what was achieved was that the population of East Germany, eastern Austria, northern Italy, the Czech Republic, Poland, Slovakia and Slovenia did not decline any more at least up to 2015.

Small and medium size enterprises (SME) played a more important role in economic development than in the baseline scenario. The role of multinational enterprises remained of course also very important, but a large number of suppliers emerged consisting mainly of local SMEs. Low wages, played a less decisive role as location advantages, while improving infrastructure, environment, skilled labour and potential supply networks became more important. The increasing role of locally based SMEs also meant that entrepreneurial income

generation was more evenly distributed and small and medium size cities had a better chance for development.

A number of large metropolitan areas of the cohesion countries benefited from EU support, in addition to the impact of market forces. Polarisation processes continued but were somewhat counteracted by significant support being allocated to the more rural areas too. The resulting territorial differentiation between metropolitan and non-metropolitan areas was less strong than in the baseline scenario. The development of medium-sized and small towns benefited from a favourable transport policy which did not concentrate infrastructure investments only on major axes connecting large cities, but paid also attention to secondary networks.

By 2013, EU subsidies to farmers from new member states became comparable to those paid to EU-15 farmers. In fact, levelling was completed even earlier, since the governments of new member states paid additional supports to their farmers. The EU supported mainly those sectors of agriculture which were the typical products of North-West Europe: grain, milk, cattle, sheep. Several important products of the south-eastern and eastern new member states like wine, fruit, oil, pigs and poultry however enjoyed less or no support. Furthermore, the new private farmers of the new member states had started their activity only in the 1990s with the exception of Poland. In earlier times, they were part the collective farm system). They thus had a competitive disadvantage in respect to the accumulation of necessary capital and the provision of modern equipment. The continuation of the CAP support meant that agricultural "surplus" employment could be partly kept in rural areas, a large part of farmers' income coming from EU support. Migration to cities and especially to the pentagon and other core areas has been lower than in the baseline scenario. But the bulk of agricultural products on the market were nevertheless produced by a rather small fraction of farms. Agricultural and rural development and its spatial structure differ much less from that seen in the baseline scenario with respect to the structure of production, than with regard to employment and social trends. The development of renewable energy sources, including energy crops, was however more strongly supported than in the baseline scenario.

Territorial integration progressed along the borders of the new member countries, except along the external borders. The persistence of extreme disparities and gaps along the eastern borders of the EU represented – in some ways –another threat to member states. Thus some policies and instruments had to be applied to avoid, or at least to mitigate, these threats. Neighbourhood and partnership instruments became therefore indispensable parts of a cohesion oriented EU policy.

Southern Europe

Compared with the baseline scenario, restrictive policies have limited the importance of external immigration, especially from the countries south of the Mediterranean, as a demographic development driver in Southern Europe. However, the improvement of the environment and the attractiveness of the region with respect to its favourable climate, has intensified internal migration from the rest of Western Europe (retired people etc). Population ageing has been less strong in north-west Spain, southern Portugal, as well as in southern and north-eastern Italy, Sardinia and Corsica than in the baseline scenario. By 2030 the demographic potential is stronger in the French regions, in Andalusia, Murcia, Crete and Cyprus, while the central and southern Portuguese regions, Corsica and Sardinia as well as Piemonte, Emilia Romagna, Toscana and Lazio in Italy have the weakest potential. Falling total population is also continuing to impact some areas of Southern Europe.

A greater performance in Greece and parts of central and southern Italy has contributed to the drift of the magnet of growth towards South-Eastern Europe. A great number of peripheral regions of Southern Europe have grown more than in the baseline scenario: Greece, Sardinia and Corsica, most regions of Spain. Some relatively better performing areas can be found also in peripheral and/or rural regions, like Languedoc-Roussillon in France, Toscana, Marche, Abruzzo, Calabria, Veneto and Friuli in Italy. These tendencies are confirmed by the change in the relative position of regions. In Southern Europe some additional areas have emerged as winners, due to their relatively low increase in population growth. In 2015 a higher per capita GDP level than in the baseline scenario has been achieved in the periphery of Southern Europe, in most remote areas. Southern EU regions bordering neighbouring countries have lost however development opportunities since EU membership was denied to the Western Balkans and Turkey and EU relationships with the southern Mediterranean countries were not intensified.

Compared with the baseline scenario, Southern Europe metropolitan areas are less favoured. This is true for the capital cities of Athens, Rome, Madrid and also for those considered as 'engines of Europe', like Milan and Barcelona. Inversely, small and medium-sized towns in the numerous less developed regions of this area are more strongly supported, especially as far as services of general interest are concerned. The numerous Southern European rural areas, particularly the peripheral ones, have profited from an enhanced support by RDP and the structural funds focusing on sustainable development. Experience farming has broken through in rural areas with small-scale landscapes. The growing demand for cultural landscapes has provided opportunities for agrarian, natural and landscape management, particularly in small-scale landscapes. Rural areas have become economically more diversified as well as more socio-economically viable. Therefore, the dichotomy between metropolitan and non-metropolitan areas is less strong in the cohesive scenario.

The basic factors leading to the new energy paradigm are the same as in the baseline scenario. However, a large part of Southern Europe containing peripheral and/or rural areas as well as small and medium-sized cities and towns is in a better position than in the baseline scenario, because of the enhanced support from RDP and structural funds through appropriate measures. The TEN-E have been developed as a priority in less developed and peripheral regions, while the RDP has also allocated substantial resources to the production of energy in rural areas. More investments have been made in intermediate technology sectors, especially in less developed regions. Solar energy (presenting a higher potential in Southern Europe) and wind energy, as well as the production of energy crops have enabled the creation of decentralised energy supply systems which also benefit small and medium-sized towns, making them less dependent upon external energy supplies. At the same time, they have contributed to improving the quality of the environment.

The transport priorities of the cohesive scenario have contributed to a more balanced and sustainable spatial development in Southern Europe. In the context of rural development plans concerning a large part of this area, support has been given to strategic regional axes, so as to connect as many medium-sized and small towns as possible to the trunk networks. Greater attention has also been paid to environmentally-friendly transport modes such as efficient railways and maritime routes in Southern Europe. The latter reduced the impacts of higher energy prices. Despite these improvements, transport costs between Southern Europe and EU central regions have not decreased.

Southern Europe benefited from the prioritized allocation of significant structural funds and RDP resources to environmental improvement and protection in less favoured regions. Lowering of water stress (in comparison to the baseline scenario) achieved through investments in water-saving irrigation techniques, desalination plants, cultivation of less water-demanding crops etc has benefited Southern Europe more, as drought issues are

very important. Consequently, less agricultural areas have been abandoned because of drought. The region has also benefited from the more intensive efforts made to prevent forest fires through better forest management as well as from the stronger rural development which has favoured the maintenance of cultural and natural landscapes as a resource for rural tourism. The negative impacts of climate change on the rural areas have been much less important than in the baseline scenario, because enhanced support has been allocated to adaptation measures of agricultural production, to forestation and to the development of energy crops cultivation which contribute to the production of biomass. Environmental improvement reinforced tourism development which is of crucial importance for Southern Europe. Gated communities in tourism resorts have not been emerging since less favoured population groups are better integrated into the labour market. Tourist development and growing demand for second homes combined with the growing immigration pressure mainly in metropolitan areas have supported the continuation of the development of the construction sector.

Spatial integration both in the entire southern European area and in its western and eastern parts, has been intensified more than in the baseline scenario. Important metropolises and a considerable number of other big cities have expanded. In the central and southern part of the Balkan region, spatial integration has been intensified more than in the baseline scenario, based on an increase in networking relationships among both the important metropolises of the region (Athens, Thessalonica, Sofia and Bucharest) and the other big and medium-sized cities.

Areas with low population density

Under cohesive assumptions, the median age of the population by 2030 is more favourable than under baseline assumptions, especially in the Swedish and Norwegian regions of the "Mid-Norden". These regions have somewhat benefited from pro-active demographic policies and from measures addressing families. The slow-down of out-migration of young women had a positive impact on fertility rates. The demographic potential in 2030 however is not more favourable than under baseline assumptions.

There is a clear difference, though, in the economic field with the baseline scenario. The relative position of the less populated Nordic regions has significantly improved up to 2015 as compared with the European average, with values largely above those of the catching up regions of Central and Eastern Europe. The most successful regions, in this respect, are mainly those of Norway and Sweden. On the Finnish side, catching up is also largely above-average. Sustained EU support to economic activities has had very positive impacts. The trend has the potential for continuing beyond 2015, provided EU support is also maintained at a substantial level.

Investments in transport infrastructure have not been significantly higher, up to 2030, than in the baseline scenario. There is therefore no basic difference with the baseline scenario in terms of Europe-wide multi-modal accessibility, but there is a moderate improvement of accessible GDP, in less than 10 hours, especially in the coastal areas.

Cohesive policy measures have proved to be rather efficient in the development of indigenous resources, including tourism. Support has also been allocated to more effective exploitation of renewable energy sources. Forest management and prevention measures have made it possible to curb the impact of forest fires generated by increasing drought in summertime. By 2030, the less populated Nordic regions have become somewhat more attractive than they were in the early 2000s.

Mountain areas

Under cohesive assumptions, the demographic evolution of numerous mountain regions in Europe is more favourable than under baseline assumptions. This results not only from the existence of demographic policies supporting families and promoting a revival of fertility rates, but also from the economic evolution which is by far less detrimental in terms of employment and out-migration. Here again, the diversity of situations does not make it possible to describe homogenous demographic and economic evolutions for all mountain regions. The demographic potential by 2030 of a number of mountain regions is slightly above that prevailing under baseline assumptions, for instance in the western Alps or in the mountains of north-west Spain. There is however no significant difference in Mediterranean mountains, where population ageing in the early 2000s was rather advanced and numerous villages already abandoned.

The economic performance of several mountain regions up to 2015 has also been stronger than under baseline assumptions. The growth rate differential in mountain regions is rather significant both for Western and for Central and Eastern Europe. Good performance can be observed in the mountain regions of the Iberian Peninsula, of the French Massif Central, of Scotland, of the Nordic countries, of the central and eastern Alps and – to a lesser extent – of the Carpathian regions. The western Alps are less favoured than under baseline assumptions. The maintenance of substantial EU support through the CAP and structural policies, and the continuation of an efficient rural development policy, largely explain this achievement. An additional factor has been the implementation of a specific transport policy paying attention to the maintenance and development of public transport services and to the quality of secondary transport networks. This has generated an increase in regional accessibility of numerous mountain regions, while their Europe-wide accessibility, being more dependent upon major transport axes, has generally regressed.

The development of renewable energy sources (biomass, solar, small hydro-power plants) has been stronger than in the baseline scenario, benefiting from EU support. Dependence upon fossil energy sources and upon nuclear energy has regressed up to a certain extent, however with wide differences between the various mountain regions.

The impact of climate change on winter tourism has been similar to that in the baseline scenario, with a transfer of winter sport activities to higher altitudes and latitudes. Structural policies have on the other hand provided support to the development of other forms of mountain tourism, more related to landscapes and to various types of heritage, so that the global impact on employment and generated wealth has been more positive than under baseline assumptions.

With regard to the impacts of natural hazards, a significant difference exists with the baseline scenario because of more substantial EU-supported prevention and mitigation measures. Settlements in mountain areas have become better protected against flood and land slides through stricter building regulations and appropriate public works. Forest management has been enhanced, so that the impact of increasing drought on southern European mountains has been less detrimental in terms of forestry productivity and forest fires.

Ultra-peripheral regions

Considering the amount of support allocated by the Cohesion Policies to the UPR in the early 2000s, EU support in the context of the cohesive scenario has not been significantly higher than under the baseline one. Differences with the baseline scenario in terms of the territorial impacts of structural and cohesion policies are therefore not extensive, but a number of distinctive impacts have nevertheless appeared. Transport services with

mainland Europe and in rural and less developed parts of the UPR have been more supported. This policy has been of particular importance in the archipelagos. The shift from Pillar 1 to Pillar 2 in CAP support has benefited areas with low productivity in agriculture, but has been of more modest significance, in terms of employment and yields, in fertile agricultural areas affected by increasing external competition and decreasing price support mechanisms. The pro-active policies of economic and socio-cultural integration had beneficial impacts, both in terms of the integration of young people into labour markets and in the maintenance of a peaceful civil society. More emphasis than in the baseline scenario has been put on the development and promotion of indigenous productions and comparative advantages in terms of heritage, soft tourism, handicraft products etc. Significant efforts have been made to develop the various renewable energy sources and to reduce the dependence on fossil energy. Substantial preventive measures against the impact of natural hazards have made it possible to limit physical and human damage and maintain a sufficient level of security in spite of a higher occurrence of hazards caused by climate change and sometimes seismic activity. The policy of strict immigration control has made an efficient and substantial coast guard necessary around most UPRs, while in French Guyana, land-borne immigration has proved more difficult to contain, despite increased controls of main transport axes. By 2030, most UPRs are still extremely dependent upon mainland Europe, but some have been successful in promoting sufficiently indigenous resources to create dynamics and to counterbalance a number of their disadvantages.

4.1.6 Territorial issues arising in 2030 from the cohesion-oriented scenario

Europe-wide level

Regional disparities are still important by 2030, although less significant than in the baseline scenario. Global European growth and competitiveness are however lower. The divide, in terms of wealth, between metropolitan areas and more rural areas is less strong than in the baseline scenario, while disparities between East and West remain important despite strong cohesion policies. New global integration zones have not emerged. Differences in accessibility between the wider pentagon and peripheral areas have been somewhat reduced thanks to transport investments in favour of peripheral regions, but the impact of high energy price on transport costs is detrimental for remote regions. Despite strong support by EU cohesion policies, the leverage effect on private investments in a number of less-favoured peripheral areas has remained low (however less than in the baseline scenario).

Intermediate level

Territorial integration at transnational and cross-border level, driven by networks of cities, is weaker than in the baseline scenario. Fewer economic and technological synergies have developed. A number of rural regions are facing a spiral of decline (population ageing, depopulation, negative impacts of drought etc.), but they are less numerous than in the baseline scenario.

Regional and local level

The global competitiveness of metropolitan areas is lower than in the baseline scenario. The internal differentiation of cities and the related segregation trends are however also lower. The socio-cultural integration of minorities and of disfavoured groups has progressed in large cities, but is limited by insufficient job opportunities resulting from lower economic growth.

4.2 Rhine-Rhone Europe: competitiveness-oriented scenario

4.2.1 Objectives and principles of the integrated competitiveness-oriented scenario

This scenario is a prospective, policy-oriented scenario. It is based on the assumption of a significant reshaping of EU policies originating in the disappointing results of the implementation of the Lisbon Strategy during the period 2000-2005. The EU budget is being reduced and EU expenditures are being targeted towards R&D, education, ICT and strategic external accessibility, including in structural policies. The CAP is subject to rapid and radical liberalisation, with a significant reduction of support, of external tariffs and of export subsidies. The budget of structural policies is also being reduced, with a part of former EU interventions being re-nationalised and EU support being concentrated on the most competitive areas of less developed regions. As a counterpart, public services are further liberalised and privatised, labour markets are regulated in a more flexible way and the third pillar of EU policies (foreign policy, justice, security etc.) is being strengthened. Widening of the market through further EU enlargements is part of the strategy of increased competitiveness. After Romania and Bulgaria join the EU in 2007, the Western Balkans will join in 2015 and Turkey and Ukraine in 2020. The neighbourhood policy is being strengthened and the Maghreb countries are integrated into the European Economic Area.

4.2.2 Hypotheses of the integrated competitiveness-oriented scenario until 2030

Demography	- Increase in selective external in-migration: economic sectors & destination - Abolition of constraints to internal migration - Increase in retirement age - Encouragement of fertility rate through fiscal incentives
Economy	- Stronger reduction of total public expenditure compared with the baseline scenario - Further privatisation and liberalization of public services - Prioritisation of public expenditures in R&D, education, ICT and strategic external accessibility (ICT and transport) - More and easily accessible venture capital - 'Flexibilisation' of labour markets
Energy	- Steady increase of energy prices - European consumption increasing - Realisation of TEN – E: investment in infrastructure according to market demand - Priority to large-scale energy production for metropolitan areas as an alternative for oil and gas
Transport	- Realisation of TEN-T: investment in infrastructure according to market demand - Prioritisation of links between metropolitan areas - Application of the Kyoto Agreement
Rural development	- Rapid and radical liberalisation of CAP (reduction of tariffs, of budget and of export subsidies) - Reduction of support to rural development policy - Rapid industrialisation of agricultural production

	- Strong dualisation of rural areas, resulting from market forces
Socio-cultural sector	- Reactive management of social problems in large cities - Increase of surveillance and security systems
Governance	- Abolishment of barriers to cross-border co-operation - Less public intervention - Wider application of the Open Method of Coordination - Increased role of private sector in decision making - Strengthening of the third pillar of the EU policies: foreign policy, justice, security
Climate change	- Moderate overall climate change (+1°) - Increase of extreme local events - Constant to increasing emission levels - Mitigation measures based on flexible schemes & stimulation of alternative technologies. - Adaptation measures only where cost efficient
Enlargement	- Continuing enlargement to widen the market: - Romania, Bulgaria in 2007 - Western Balkan, EFTA/EEA countries in 2015 - Turkey in 2020, - Strengthening of the neighbourhood policy (Maghreb, Ukraine, Russia etc.)

4.2.3 Scenario process

Demographic changes and related territorial impacts

The most significant difference between this scenario and the baseline scenario is the opening of external EU borders to (selected) immigration. Internal borders are equally open and the restrictions to the free circulation of workers following the accession of new member countries to the EU are abolished. In addition, specific measures are taken to increase fertility rates (family policy) and to increase the retirement age. Generous pension schemes are abandoned as life expectancy in many occupational groups continues to rise. Maintaining a dynamic labour market is uppermost in the policy considerations of both national governments and the EU. To plug the gap caused by the expanding support ratio, a vigorous 'labour replacement' immigration policy is being co-ordinated across the EU, targeting young and/or highly skilled labour from across the world. The policy is strictly regulated and nationality is not an inevitable side effect of coming to work in Europe. The social impacts of this are divisive with unregistered migrants accepting negligible wages and a low level of socio-cultural integration are the almost inevitable consequence. Social friction as it arises is met with strong restraint and there are perceptible increases in surveillance and security, which have become a major business in their own right. Consequently, the global European population by 2030 exceeds that of the baseline scenario. At regional level, the differences are particularly strong in Western Europe, with stronger population growth or lower population decline in a number of regions belonging to the pentagon: north-west France, including Paris, Randstad, Rhein-Ruhr, Rhein-Main and metropolitan regions of South-Germany, northern Italy. The same tendency can be observed in the peripheries: regions of southern France, various central and southern Italian regions, Spanish regions of the Mediterranean coast, metropolitan regions of Portugal, southern Ireland, central Scotland, southern Sweden and southern Finland. Regions with metropolitan areas and large cities are clearly favoured, both in the pentagon and outside. In Central and Eastern Europe however, the differences with the baseline scenario are less significant. The metropolitan regions of Prague, Bratislava, Budapest,

Bucharest and Sofia are also favoured and, to a lesser extent, the Baltic States and numerous Polish regions. Compared with the baseline scenario, the least favoured regions are rural areas, both in the centre and in the peripheries. Consequently, the global European population by 2030 exceeds that of the baseline scenario.

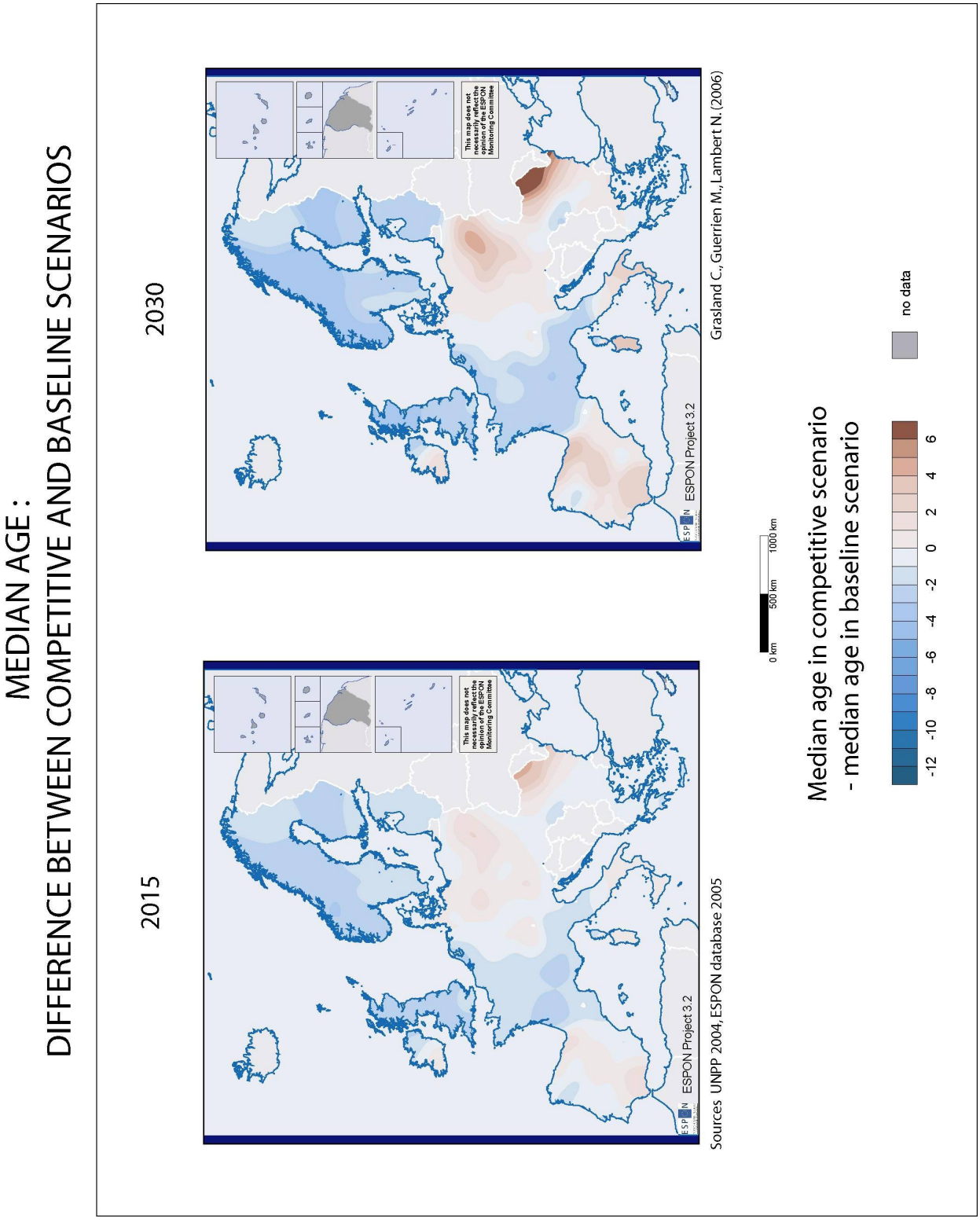


Figure 28 Median age – 2015 + 2030 - difference between the competitiveness-oriented and the baseline scenario

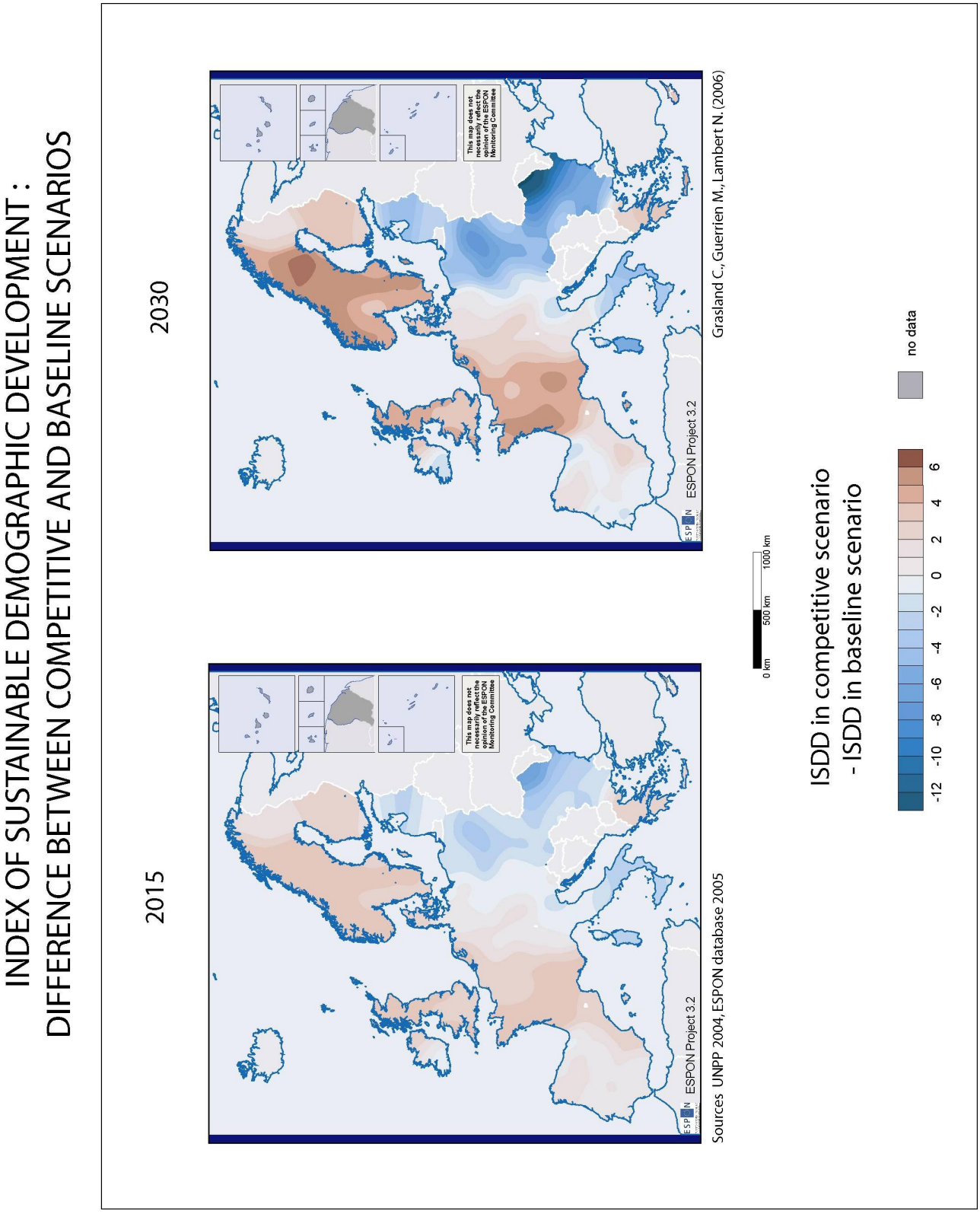


Figure 29 Index of sustainable demographic development – 2015 + 2030 - difference between the competitiveness-oriented and the baseline scenario

Compared with the baseline scenario, population ageing is stronger in a number of peripheral regions. The median age of the population is higher in Central and Eastern Europe, especially in northern Romania and Poland, as well as in western Spain and southern Portugal, southern Italy and southern Ireland. It is lower in France, the UK, the Nordic and the Baltic countries. The demographic potential (Index of sustainable demographic development) shows a rather reverse picture, with higher values than in the baseline scenario, in most regions of France, the UK and the Nordic countries, but also, to a lesser extent, in the Iberian Peninsula, Greece, Cyprus, the Benelux countries and Germany. At the opposite extreme, the demographic potential is significantly lower than in the baseline scenario in most regions of Central and Eastern Europe and in southern Italy. The regions of the pentagon are generally more favoured, in terms of demographic potential, than in the baseline scenario.

Economy and technology

Enabling Europe to draw maximum benefits from the globalisation process has become the *leitmotiv* of European policies. The drawbacks of the European economy in the early 2000s and the inability, up to 2005, to fulfil efficiently the objectives of the Lisbon Strategy have led governments to significantly change their approach to economic development. A majority position, if not a consensus, is progressively being reached in the European Council to concentrate efforts, as well as European and national resources, on the objective of increasing global competitiveness. Total public expenditures are being reduced with the aim of bringing down both the level of public debts and of taxes. Public services are further liberalised and privatised. Higher flexibility is introduced into the regulations governing the labour markets of the various countries. Measures are taken to increase the volume of available venture capital as well as its accessibility, in particular for small and medium-sized enterprises. European policies are significantly reshaped. Adaptations are made to the CAP and to structural policies during the period up to 2013 and fundamental reforms are carried out afterwards. Resources are then diverted from the CAP and Structural Funds (which are partly re-nationalised) towards R&D, technological development, ICT, education and training, improvement of the external accessibility of Europe and the transport links with neighbouring countries. The enlargement process in Europe has been continuing since 2005. First, Bulgaria, Romania, and Croatia become EU members. Thereafter, EFTA/EEA-states enter the EU. Later, Turkey becomes a full member of the EU as well as the Western Balkan's countries. Widening is given priority compared with deepening. Europe's industry benefits from the enlarged single market which significantly improves Europe's global competitiveness. EU policies are primarily focused on setting an efficient framework which enhances the free movement of production factors: labour , capital and services).

Technological development is the cornerstone of the new policies, the objective being to reduce the gap between Europe and other advanced economies (in particular the USA and Japan) and to maintain sufficient distance in technological development with emerging economies such as China, India, Brazil and smaller ones. Europe is ready to give up large segments of its economic structure with dwindling productivity, provided growth can be achieved in high-tech segments of manufacturing industries and services with strong knowledge and capital intensity. Although the intercontinental economic interactions strongly increase in the context of accelerating globalisation, Europe draws stronger benefits from this evolution than in the baseline scenario because large European industrial/technological groups are strengthening, thanks to the support given to R&D policies. Some are then in a position to take over companies located in other continents and penetrate markets at the world scale. The sectors in which Europe performs with high competitiveness are especially biotechnologies, energy and transport, while North-American

and Asian competitors still maintain a positive gap in relation to Europe in the information technologies, however this is a smaller one than in the baseline scenario.

In the field of green biotechnologies, the development of gene-modified crops diffuses widely. Large agricultural and food companies benefit more from the outputs of research and are more capable of meeting the requirements of consumer protection. Regions with intensive and productive agriculture, especially the most central ones, are the main beneficiaries. While prospering countries in Western Europe can afford a sound consumer protection, the countries in Eastern Europe do not to the same extent, and accept risks to health. In the absence of a strong spatial planning policy, the consequence is a progressive elimination of organic farming and of conventional agricultural production by gene-modified farming. As far as red biotechnologies are concerned, peripheral regions are neglected to the advantage of more developed regions, enabling in the latter support of excellent research at top universities in order to strengthen them for international competition and to avoid a brain drain. Significant efforts and investments in technological development are also made in the fields of transport and energy. Broadband networks are developed mainly between metropolitan areas and large cities throughout Europe. The use of ICTs in transportation is becoming generalised. ICTs progress also in numerous other sectors and impact strongly on the organisation of society and of production systems, especially in the most developed regions where more investments are made and where the penetration of new applications is more rapid. Automation technologies are increasingly applied not only in manufacturing industries, but also in services and in households.

The competitive scenario registers a more expansive aggregate growth rate for Europe as a whole with respect to the baseline scenario. This efficiency-oriented policy reinforces however tendencies of spatial concentration in Europe. Among the most benefiting regions are those which already showed a good endowment, with knowledge society-related resources as their starting point, i.e. at the beginning of the 21st century. Compared with the baseline scenario, regions with large metropolitan areas have a GDP per capita progressing more until 2015. A number of most developed regions in the pentagon belong to this privileged category, but also a number of competitive regions outside of it, such as southern France, the Spanish metropolitan regions, the metropolitan regions of southern Scandinavia and Finland. In the countries of Central and Eastern Europe, a majority of regions show better performance than in the baseline scenario, especially in the regions with metropolitan areas. Generally the "second-rank or potential MEGAS", both in East and West, are involved in the growth process. The regions which show weaker performance than in the baseline scenario are almost all located in the European peripheries: northern regions of the Nordic countries, northern Scotland and northern Ireland, western France, north-west Spain, Sardinia and Calabria in Italy, as well as most of the eastern external border regions. In terms of changing position up to 2015, the regions with stronger improvement than in the baseline scenario are mainly the Paris region and the Benelux countries, the London region, the regions of northern Italy and south-eastern France, the Spanish metropolitan regions and the Stockholm region. The regions loosing ground in comparison to the baseline scenario are, above all, the central and northern regions of the Nordic countries, the western and central French regions, Ireland, the regions along an north-south axis from eastern Germany to north-eastern Italy, as well as various other peripheral regions (north-west Spain, southern Italy, northern Greece, Cyprus, northern Scotland).

This evolution results in increasing disparities in terms of economic development and employment opportunities, both within the member states and the EU as a whole. Polarisation of the European territory increases significantly. A clear tendency can be observed towards a more concentrated development in strong areas of each country, reflecting the "champions" growth assumptions. Cities and agglomerations, in particular in certain CEE countries, have problems with the absorption of workforce made redundant in the less developed rural regions. It may also result in growing cross-border labour force

migrations. As a result, both the pentagon and other metropolitan areas are gaining in terms of availability of workforce at the expense of more peripheral regions.

Smoothed maps based on MASST results: cumulative growth (left) and change in relative position (right) - 2002-2015 – Difference between the competitiveness-oriented and the baseline scenario

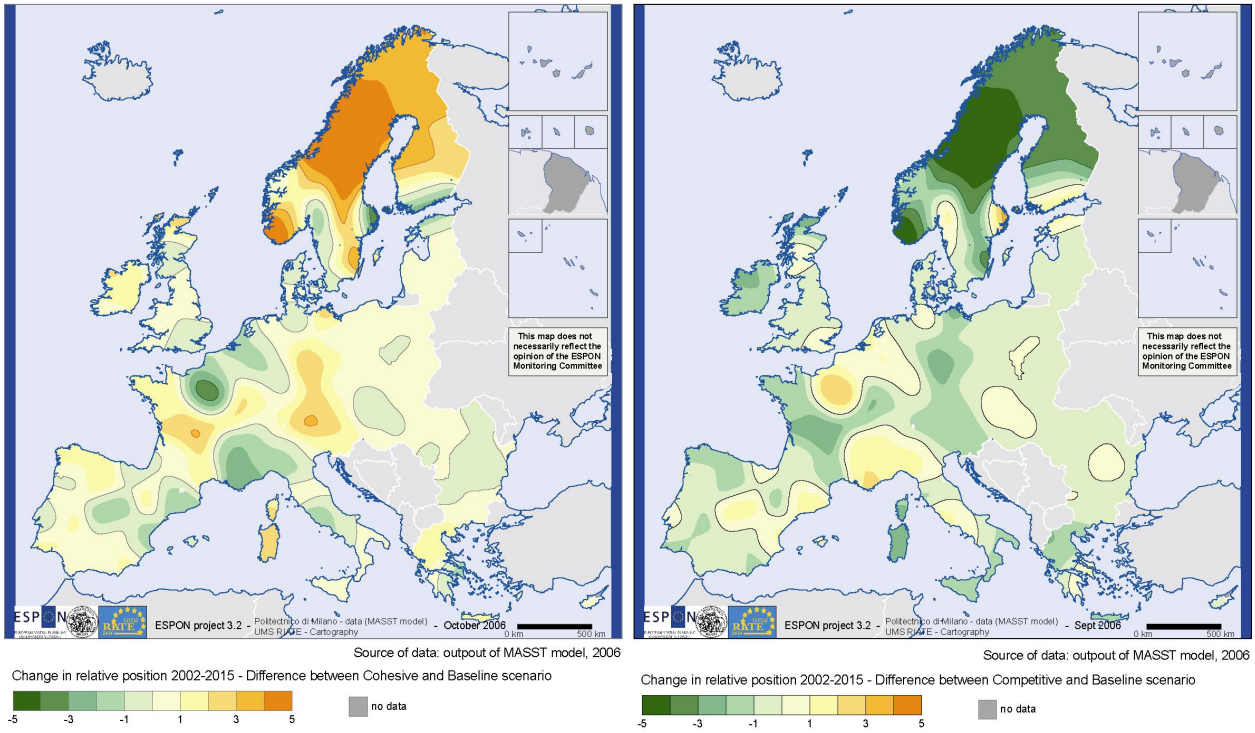


Figure 30 Smoothed maps based on MASST results: cumulative growth (left) and change in relative position (right) - 2002-2015 – Difference between the competitiveness-oriented and the baseline scenario

At the opposite end of the scale, with significantly weaker cohesion-oriented structural support, reduced CAP and under the pressures of globalisation, the less developed regions undergo turbulent restructuring with reduced employment in agriculture and in rural areas. Unemployment (both open and hidden) is growing. This results in faster depopulation of those areas and in lower investments in strategic infrastructure, human resource development and entrepreneurship. As a result of these trends, while intra-national disparities grow with respect to the baseline scenario, disparities among countries decrease more than in the baseline scenario, thanks to strong catching up processes in lagging countries through their national 'champions'. The evolution of EU policies after 2015 towards an even more competitiveness-oriented approach will induce a strengthening of the trends observed up to 2015 in a context where both external and internal migration flows will increase.

Territorial integration and co-operation is significantly different from the situation in the baseline scenario. The networking of metropolitan areas progresses significantly, driven by the private economy and especially by large companies. Large cities of Central and Eastern Europe are also included in this process, favoured by the strengthening of the Trans-European corridors and of broadband networks. Border regions are no longer able to rely on

European assistance schemes which, until 2013, provided specific support for overcoming border specific hindrances. In addition, the overall absence of a strong cohesion policy leads to a situation where the majority of the economically weak border regions remain in a status of backwardness, particularly in terms of low employment opportunities and correspondingly high unemployment rates. For many of the economically weak border regions, primarily for those between the EU-15 and the EU-10, the cut of EU support both for cross-border co-operation and more generally for regional development came too early. High unemployment rates on both sides of the border enhance out-migration. Only in border regions with strong metropolitan areas, polycentric structures and/or other locational advantages (as is the case in parts of the German-Dutch border region, the Upper Rhine Region and the Saar-Lor-Lux-Region and, to some extent, at the Slovak-Austrian Border near Bratislava and Vienna), the polarisation process stretches over the border to favour territorial integration. Many border regions gain only little benefit from the reconstruction and modernisation of Trans-European road and rail networks. They remain more or less transport corridors, whereas the agglomerations in the hinterland are capable of reinforcing their position.

Rural areas are subject to an evolution which was already noticeable in the late 1990s and early 2000s. This consists of a growing dichotomy between well-off and less developed rural regions, generated mainly by the relative proximity to metropolitan areas, the attractiveness and the intensity of agriculture. This evolution is stronger than in the baseline scenario. Intensification and scaling-up of agricultural production have received a strong impulse by the radical liberalisation of the agricultural markets and the substantial reduction of the CAP budget. Structural Funds are concentrated on the most competitive rural areas of the less developed regions, first in the new member countries and later only in the candidate countries. This evolution is further stimulated by the low priority which is given to criteria of environmental protection and animal welfare (taking away barriers for competitiveness). Intensive cattle farming, the production of crops and cereals, as well as horticulture, further increase in fertile regions. In these areas food production competes to some extent with the production of energy crops. In many other rural areas surrounding large cities in Eastern and Southern Europe, economic activities become more diversified than in the baseline scenario because of high economic dynamics. At the same time, however, an increasing number of rural areas in Western and Eastern Europe are confronted with further marginalisation and abandonment. This negative evolution is also much stronger than in the baseline scenario. This is particularly the case in rural areas with an unfavourable demographic situation (high levels of population ageing), unfavourable production conditions (such as low levels of soil fertility, increasing drought) or low attractiveness. Subsistence farming is maintained or even increases in the peripheral areas of the CEECS and in Southern Europe and Eastern Turkey. Because of the changes in consumer preferences and the reduction of RDP subsidies, experience farming and nature and landscape management only survive on a small scale in urbanized regions or rural areas with small-scale landscapes.

Transport

In the competitive scenario, transport is also meant to contribute to European competitiveness globally and transport policies are shaped accordingly. Significant EU resources (much more than in the baseline scenario) are injected in the TEN-T and into research and technological development, in order to counteract the progressing oil depletion and the related price increase of fuel. A large variety of applications in the sphere of Intelligent Transport Systems are developed and implemented to increase transport efficiency and reliability, transport security, optimise the use of infrastructure and satisfy mobility needs. Transport flows are systematically accompanied by information flows, both for the transport of goods and persons. As in the baseline scenario, the sustainable character of increasing energy prices (in particular of oil) remains a major constraint in the

transport sector. The further development of high-speed train networks and the availability of substitution fuels make it possible to ensure the level of long-distance mobility necessary to maintain robust economic growth. At regional and local scale, European citizens adapt their behaviour to increasing transport costs and organise their mobility, as far as possible, in a more rational way (car sharing, public transport, change of residential location). The further expansion of metropolitan areas brings with it however new waves of suburbanisation, a trend which limits the reduction of mobility. While younger generations and immigrants concentrate in and around metropolitan areas, retirees move towards attractive rural areas, small and medium-sized towns and develop new patterns of mobility more related to recreation, cultural activities, health care, leisure travelling etc.

The transport situation is conditioned by higher rates of economic growth than in the baseline scenario. This is somewhat smoothed by the more rapid move of the European economy towards intangible sectors, especially in central regions. Not only is the nature of transport flows changing, but also their spatial distribution in relation to further significant EU enlargements. In the wider integrated Europe of the 2030s, long-distance transport flows are much more significant than they were in the early 2000s in a more limited European space, and more and more countries are affected by transit flows.

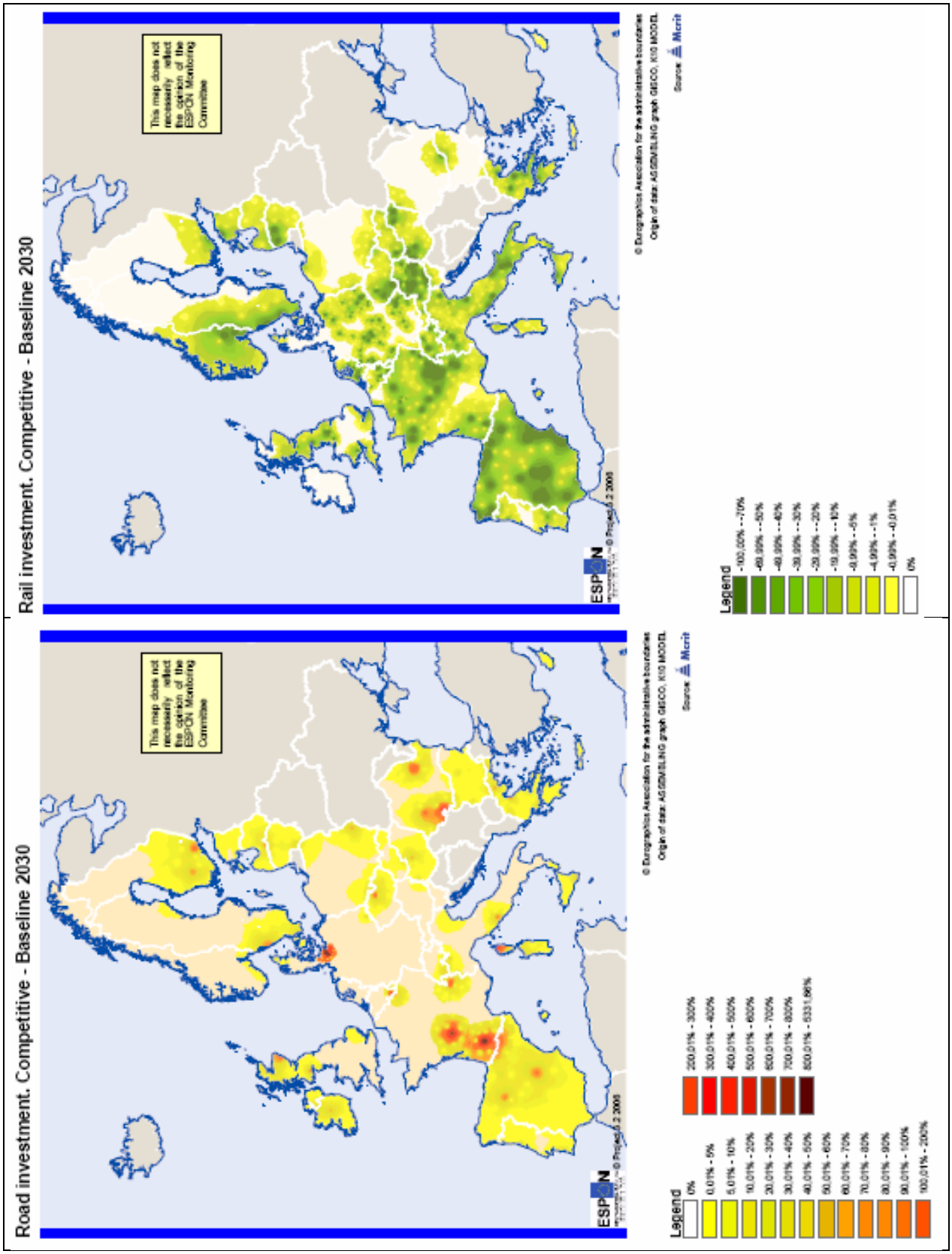


Figure 31 Rail and road investment until 2030 – Difference between the cohesion-oriented and the baseline scenario (KTEN Model)

The pattern of investments in transport infrastructure up to 2030 differs rather strongly from that prevailing in the baseline scenario. In most European regions, the volume of investments in rail infrastructure is lower. This is particularly true for the Iberian Peninsula, France, Italy, Greece, the southern parts of the Nordic countries, numerous regions of the UK and much of the new EU-10. The difference with the baseline scenario is more accentuated in the rural regions of the respective countries. Regions where the difference with the baseline scenario is not significant are the northern regions of the Nordic countries, Ireland, central Scotland, central Poland and various regions of Romania and Bulgaria. With regard to road and motorway investments, these are generally higher than in the baseline scenario, especially in the Iberian Peninsula, southern France, Ireland, Scotland, various Italian regions, the southern regions of the Nordic countries and most parts of Central and Eastern Europe, with the exception of western Poland. The positive differences with the baseline scenario are generally stronger in metropolitan regions.

Emissions related to inter-urban traffic are in 2030 (figure 32) globally higher than in the baseline scenario. This results from stronger investments in the road and motorway networks. In regional terms, the difference is proportionately stronger in the Iberian Peninsula, in France, Italy, Slovenia, Greece, most regions of the UK, the southern regions of the Nordic countries, the Baltic States, Bulgaria, various regions of Romania, Poland and the Czech Republic. It is lower in Hungary, Slovakia, the northern Nordic regions, Ireland and various Polish regions. A significant negative difference with the baseline scenario appears only in south-western Norway.

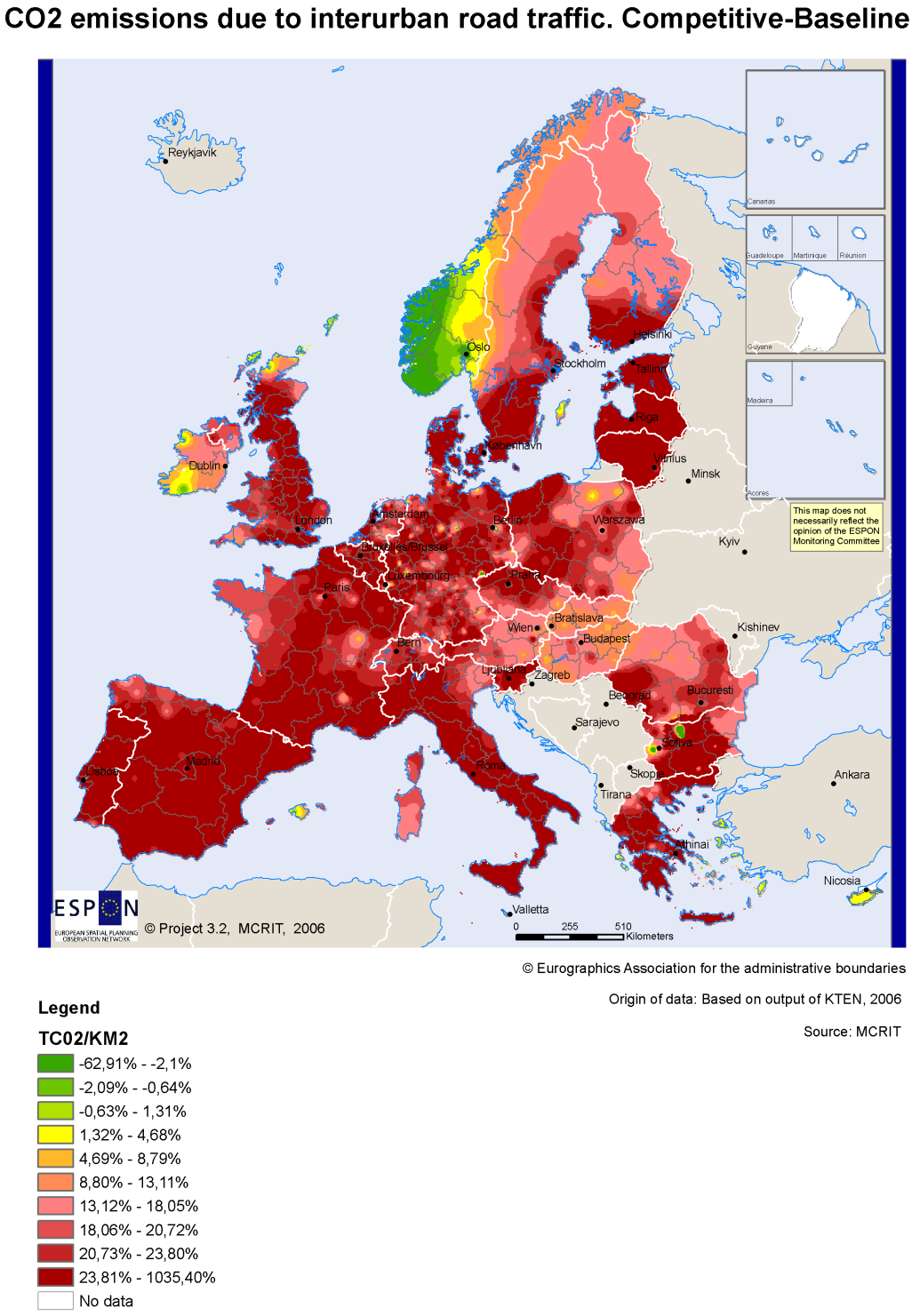


Figure 32 CO_2 emissions (T/Km2) - 2030 – Difference between the competitiveness-oriented and the baseline scenario (KTEN Model)

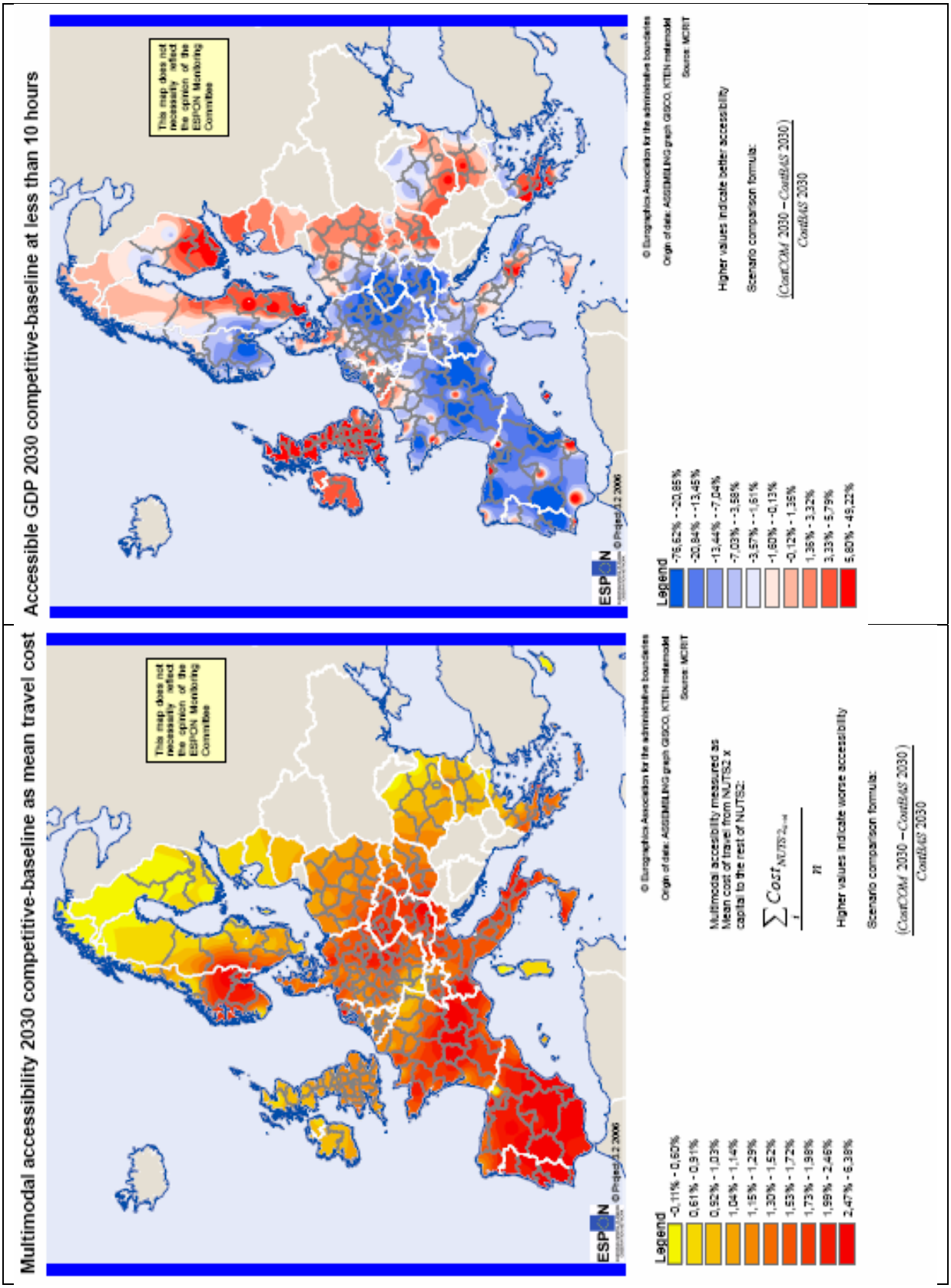


Figure 33 Multimodal accessibility as mean travel cost (left) and accessible GDP in less than 10 hours – 2030 – Difference between the competitiveness-oriented and the baseline scenario (KTEN Model)

Compared with the baseline scenario, Europe-wide multi-modal accessibility, as measured by mean travel cost, is higher in numerous European regions, especially in the Iberian Peninsula, France, Italy, southern Norway, East-Germany, the Czech republic, Austria and Slovenia. The positive difference is less significant in Ireland, the UK, the Benelux countries, West-Germany and Poland. A slight negative difference can only be observed in northern Sweden and Finland, northern Romania, Cyprus and Corsica. When measuring accessibility to GDP in 2030 within 10 hours, the competitive scenario is less favourable than the baseline scenario in large parts of Western Europe, except the UK, Ireland, Sweden, southern Finland, central Greece and a number of metropolitan regions in other countries (Portugal, Spain, France, Italy and the Benelux countries). It is more favourable than the baseline scenario in most regions of the new member countries of Eastern and Central Europe, except south-west Poland, the Czech Republic, Slovenia and northern Romania.

Energy

As in the baseline scenario, energy prices are regularly and significantly increasing because of growing energy demand at world scale, and of progressive depletion of oil and gas resources. But the impact of growing energy prices on the global European economy are less because the European economy is more quickly moving towards a more intangible and high-tech economy, and is abandoning large amounts of poorly productive activities using low or intermediate technologies. Policies in the competitive scenario aim at strengthening global European competitiveness and in particular the position and potential of metropolitan areas. It allocates significant amounts of EU resources to R&D and to technological development at the expense of structural and rural development policies. It apportions considerable resources to the development of technologies which are likely to facilitate the provision of energy to metropolitan areas, such as new generations of nuclear power plants, but also coal gasification and liquefaction and hydrogen technologies. New generations of nuclear power plants are developed and widespread. Energy supply diversification is being promoted, however not only renewable energy sources. The hydrogen technology makes a real break through after 2010 with a large number of applications in transport, heating and electricity generation for a number of engines and electronic devices. The TEN-E are developed so as to provide energy to metropolitan areas, which is prioritised. Because of weak structural policies, EU credits for technological development and energy transport infrastructure are allocated more to developed regions than to backward ones. Global energy consumption is not being reduced, at least in the short term; because growth implies, despite further progress in the energy intensity of the economy, stronger energy consumption. On the other hand, the abandonment or relocation of weakly competitive and highly energy consuming activities (for instance metal production) is easier, and more likely to occur, in a context of a liberal and competitive economy. Energy consumption in transport is also not likely to be significantly reduced, despite technological progress in car engines, because metropolitan expansion and growing motorisation, especially in the new member countries of Central and Eastern Europe, are not compatible with the concept of compact cities.

The diversification of energy supply systems, boosted by technological development, benefits mainly the regions of the pentagon and a limited number of metropolitan areas outside of it. Peripheral regions are relatively disfavoured as far as the impacts of increasing energy price are concerned. Both higher transport costs and higher production costs make their productions less competitive in global markets. The development and application of innovative solutions in less developed regions is much more problematic, because of

insufficient financial resources. The weakness of structural and rural development policies does not make the full exploitation of the renewable energy potential of these regions possible. Consequently, they remain more dependent on the use of traditional fossil energy sources (oil, gas and coal), a fact which reduces their competitiveness, because of increasing prices and increasingly problematic supply. A significant number of more peripheral regions, especially in the new member countries, but also in the EU15 peripheries continue to have obsolete or insufficiently developed energy transport systems. The diversification process favours the large energy companies, mainly those of the pentagon. These continue to grow, also through mergers, and to enlarge their markets. A limited number of energy oligopolies are emerging, absorbing progressively the existing regional energy companies. Some are controlled by non-European mega-companies. Large energy companies also buy or control wide areas in fertile agricultural regions for the production of energy crops or in areas well suited for wind energy production.

The new energy supply strategies have both positive and negative impacts on the environment and on citizens' security. A number of new technologies, such as hydrogen production and coal gasification, have positive environmental impacts, at least in some areas. The same is true for the use of hybrid cars. By contrast though, the rapid revival of nuclear electricity production brings with it issues of security and elimination of nuclear waste. In fertile rural regions, agriculture is strongly intensifying, in particular where energy crops are being produced. The creation by powerful energy companies of large wind energy parks has detrimental impacts on the quality of natural and cultural landscapes in a number of regions. In more peripheral regions where the endogenous investment capacity is weak, the exploitation of renewable energy sources - in a limited number of areas with high productivity - is organised and controlled by large external companies, without real local control of the environmental impacts. The lack of structural measures in southern regions aggravates the impacts of drought. The production of energy crops and of biomass is severely constrained. Negative impacts on hydro-power production can also be observed.

Environment

In the competitive scenario, environmental policy is not intended to slow economic growth significantly, but must be achieved only in compatibility with economic development. In general, water stress (the balance between supply and demand) in Europe remains significant in the 2005-2030 period (more than in the baseline scenario) because of increasing consumption and limited efficiency measures. While densely populated areas in the pentagon are affected during dry summers, the situation in Southern Europe is much more serious than elsewhere because of drought. Limited investments in desalination and efficiency measures make disparities between supply and demand widen. At the same time, the irrigated agricultural sector hardly increases its water efficiency, due to a lack of incentives (no water pricing). Sometimes, especially in summer time, power plants are unable to feed enough electricity into the grid, most of them, privatized during this period, not having implemented new water-saving cooling systems. The manufacturing industry has continued its growth process, mainly in Central and Eastern Europe, feeding further the demand for water. As a result, consumer water prices have escalated, which affects sectors such as manufacturing, retail and tourism. Sparsely populated rural areas in Southern Europe are increasingly abandoned and in the process of desertification. In the competitive scenario, the effects of sustained economic growth in a relatively urbanized part of Europe, and a policy where the environment is subservient to the economy, also have detrimental impacts on water quality (lower investments in urban waste-water treatment, weak application of the nitrate and framework water directives). Because of insufficient prevention measures (especially development of water retention areas), flood hazards increase in Central and Northern Europe due to higher river discharge peaks, whilst the construction of dikes around cities divert the flood hazards to other river districts.

With regard to air pollution, the 2005 standards on air pollution (fine particulates and nitrogen oxide) are implemented only as far as local circumstances allow. As a result, Kyoto implementation is only partly successful, and this protocol is increasingly blamed for harming Europe's competitive position vis-à-vis the United States and Asia. Growth in road traffic resulting from an emphasis on motorways increases the volume of emissions, particularly in the pentagon area. This is mitigated however by the development of new technologies (especially hydrogen technologies, hybrid car engines etc.).

The competitive scenario is more detrimental to natural areas than the baseline scenario. Growth in economic activities, especially in the core region of Europe and in other metropolitan regions places pressure on non-productive land use, such as natural habitats. Wetlands and other natural areas near urban areas are transformed for urban development, and coastal areas and mountain regions are further developed for tourism. In addition, organic farming is only supported where it is economically beneficial, and in other areas agriculture intensifies further. Concerns about the protection of natural habitats and biodiversity are increasingly muted, as the immediacy of global competition dominates political and public consciousness. In all areas in which a trade-off is perceived between the two, economic interests prevail. As a result, EU policies on nature protection such as Natura 2000 see their budgets slashed as time progresses, and are weakened in the jurisprudence following challenges to the system. In Southern Europe, where most Natura 2000 areas are to be managed by traditional farming techniques, budgets are too low to manage all areas properly. As a result, by 2020 the net decline in biodiversity has been slowed, but not stopped due to remaining lack of connectivity between protected areas, and a continuing pressure on natural areas and organic farmland. In popular natural areas such as coasts and mountain ranges, and near urban regions in the pentagon and elsewhere, biodiversity actually declines.

In the competitive scenario climate change is recognized as a major problem, but measures to adapt to its consequences are principally taken at the global/international level. Preventive measures to limit the territorial impacts are generally considered as too costly and not sufficiently profitable in the short term. Some countries opt for imposing tougher standards voluntarily if their constituencies demand it. Generally this occurs in the wake of a natural disaster, and the measures taken often have a short-term or issue-based (e.g. anti-flooding) character. Thus, the situation described in the baseline scenario regarding desertification in Southern Europe, water conflicts, increased hazards in river valleys and coastal and arid regions resulting from climate change, applies to a greater extent to this scenario as well.

4.2.4 Territorial image of Europe by 2030

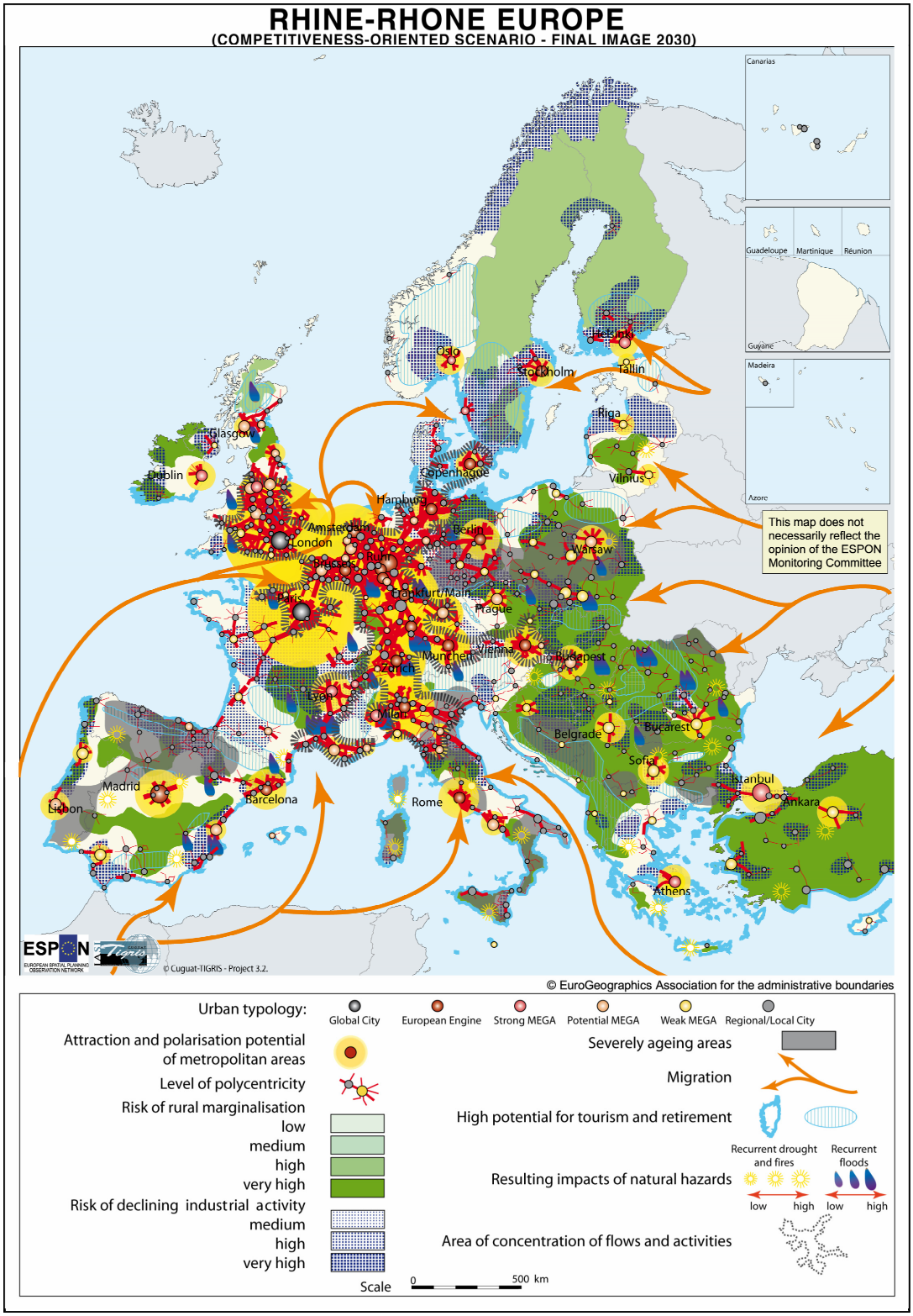


Figure 34 Schematic map of the final 2030 image of the competitiveness-oriented scenario

The map highlights the fact that the ***attraction and polarisation potential of metropolitan areas*** is particular strong and concentrated in the traditional Pentagon. Only very few metropolitan areas outside of it generate significant attraction and polarisation effects. The ***area of concentration of flows and activities*** is much more limited then in the baseline scenario. It covers only parts of the traditional Pentagon, although it extends also out of it along a few major corridors, to reach Vienna and Copenhagen. The ***risk of rural marginalisation*** is much more intense than in the baseline scenario. The ***areas at risk of declining industrial activity*** are more extended than under the baseline scenario and the intensity of risk is also higher. ***External migration flows*** are particularly intense. The ***areas with high potential for tourism and retirement*** are similar to the baseline scenario, but the ***areas with severe population ageing*** , generally in remote rural regions, are more extended. The ***resulting impacts of natural hazards*** (drought, fires, floods) are more intense than under baseline assumptions.

Compared with the baseline scenario, the demographic situation by 2030 is declining less thanks to significant immigration flows and, secondarily, to a certain revival of fertility rates. The European population has become more cosmopolitan and multi-racial. The median age of the European population is lower and the demographic potential higher in the competitive scenario than in the baseline scenario. The impact of selective immigration and internal migrations on labour markets, especially on those of metropolitan areas, is significant, so that shortages in the labour force are less perceived as a constraint to economic development than in the baseline scenario. In the context of the globalisation process, the economic inter-penetration at the intercontinental scale is strongly developed in the competitive scenario, but less to the disadvantage of Europe than in the baseline scenario, with a larger number of European companies expanding on other continents and fewer strategic economic activities in Europe controlled by non-European companies. The dichotomy, in long-term growth processes, between metropolitan areas and rural areas is strengthening, as compared with the baseline scenario.

Urban Europe

European urban systems change under the influence of both demographic and economic factors. Liberalisation of migration within Europe, combined with a more liberal approach to immigration from outside Europe, clearly strengthen demographic growth in and around metropolitan regions, in particular those which have clear locational advantages in terms of advanced economic activities. Large agglomerations in the pentagon are favoured in relation to demographic development, together with a number of other metropolitan areas situated along the corridors originating from the pentagon, in particular in Central and Eastern Europe and in the southern parts of the Nordic countries. Metropolitan areas in the remote peripheries are far less favoured. Market forces favour areas with high endowment in advanced services and technologies. Significant public and private investments are made in those regions that are capable of sustaining top universities, major financial institutions, research facilities and the like. This leads to development pressures in and around urban areas for further expansion. Major urban agglomerations, especially in the pentagon, like Paris, London, Randstad and the Rhine-Ruhr extend their influence into surrounding regions at the expense of smaller centres, because these do not have the critical mass needed to support top economic facilities. The same trend takes place even more strongly in metropolitan regions outside the pentagon.

Urban development is concentrated in metropolitan areas, but new high-tech jobs are located not only in the core cities but also in the surrounding areas where the most important resources and production factors, the professional and highly skilled labour

forces, are easily available. In the new member states and other peripheral areas, the development trend of the urban system is less clear. There where the main investment motivations and location factors continue to be cheap labour, trans-national enterprises look for more and more peripheral and smaller places where this type of labour force is still available. This results in a highly decentralised, but unstructured pattern. In these situations, where enterprises increasingly employ highly educated and skilled labour, the result is of the same type of urban structure as in the more developed countries, yet at a more modest level. Agglomerations and cities most negatively affected by the competitive growth process are those with old industries and low productivity activities which are no longer competitive in a globalised world. The population of immigrant origin (both born in Europe and outside) is less integrated in European society than in the baseline scenario because of insufficient integration policies and the continuation of illegal immigration, to a certain extent. Increasing xenophobia, self-protective attitudes and social unrests are more developed than in the baseline scenario. As a reaction, gated communities are emerging in and around a significant number of cities, as well as in attractive less urbanised areas (especially coastal regions). Suburbanisation trends are significant (more than in the baseline scenario), not only because of metropolitan population growth, but also because of segregation and insecurity in cities. Despite the development of new types of car engines (hybrid and hydrogen driven cars), the environment of metropolitan areas is further endangered by growing traffic and stronger pressures on natural areas.

Networks and co-operation between European metropolitan areas intensify, driven by the private sector, mainly large companies, but also supported by EU R&D programmes, transport and communication policies. This contributes to increasing territorial integration, especially in the pentagon. In more peripheral areas, inter-metropolitan networking only benefits a few privileged areas with a long tradition of co-operation, such as the Baltic Sea Region, as it does not benefit from Structural Funds support. Small and medium-sized urban centres are only exceptionally integrated into such networks if they are not part of a metropolitan region. Networking and co-operation between metropolitan areas take place over long distances. In most border regions, especially in Central and Eastern Europe, short-distance cross-border co-operation between small and medium-sized urban centres is much less developed than in the baseline scenario.

Rural Europe

The evolution of rural areas is much more unfavourable and divergent in the competitive scenario than it is in the baseline scenario. The strong reduction of the CAP and regional policy budgets and the orientation of EU support towards the most prosperous parts of less developed regions is detrimental for numerous rural regions, especially for the most remote and peripheral ones. In the competitive scenario, market forces are more important drivers of change than in the baseline scenario. This leads to a strong dichotomy of rural areas, with on the one hand fertile rural areas where intensive agriculture is prosperous, producing both food and energy products and, on the other hand, less favoured rural areas where agriculture and low-technology SMEs are fighting for their survival and which progressively become abandoned by population and services. In the rural areas of the new member countries, including those resulting from the successive EU-enlargements, large energy companies conclude long-term, but unfavourable contracts with farmers for the production of energy crops, thus increasing the external dependence of these areas while maintaining a low level of economic welfare.

Diversification of the economic base takes place mainly around metropolitan areas and large cities where commuters and enterprises locate. These are privileged areas of intense urban-rural relationships. Many people move out of urban areas because they prefer the more stable, secure and natural living conditions of rural areas, but they continue to do their work and shopping and spend their leisure time in urban areas. A number of attractive rural

areas are also characterised by a significant diversification of their economic base through the progress of the residential and tourist economy. This is particularly true for coastal areas along the North Sea, the Baltic and the Mediterranean, the lake districts in the UK and in the south of the Nordic countries and mountain areas like the Alps, the Pyrenees and the Carpathian mountains. These areas are however less numerous than in the baseline scenario, because the development of rural infrastructure and services is much less supported by Structural Funds. Only the rural areas with high accessibility and special attractiveness are subject to this type of evolution, which is less diffuse than in the baseline scenario. The environment of rural areas is subject to more pressures than in the baseline scenario. Intensive agriculture, accelerating urban sprawl, abandonment of less favoured rural areas and more serious damage as a result of natural hazards, contribute to significantly reducing the attractiveness of rural areas and by the same token, increasing the social and environmental costs of economic development. Rural regions along national borders are particularly disfavoured, especially in the case of Central and Eastern Europe and of the new external borders following the various EU-enlargements. Territorial fragmentation, the low level and obsolete character of infrastructure as well as emigration counteract the efforts of territorial integration which benefit from a very modest support, compared with the baseline scenario.

4.2.5 Territorial images by 2030 in the European macro-regions (comparison with the baseline scenario)

Atlantic Area

From 2005 most of the metropolitan regions of the Atlantic Area continued to act as magnets for young workers from across the region and migrants from other parts of the EU and outside. Cities such as Cardiff, Newport and Swansea virtually merged after 2015 and Lisbon, Dublin, Glasgow, Manchester and Birmingham became mega-cities in demographic terms. But de-population in the most remote and inaccessible parts of the Atlantic region have persisted, with some exceptions. Selective 'gateways' developments along the Atlantic Rim survived to develop as interfaces or 'intercontinental hubs' operating between the western fringe of the EU and the rest of the world, including North West African countries with whom the EU has been fostering relationships. By 2030 this had clearly benefited a few larger ports which had been losing position towards the turn of the century. A few smaller settlements and medium sized towns along the coast, the 'sea belt' have also thrived in relative terms, as flow of retirees have continued to settle, seeking living environments more peaceful than the increasingly congested and tense conglomerations.

The situation for rural areas became, on balance more difficult, as planned investments supporting infrastructure and transport links were not made, the focus remaining on pre-existing zones of economic significance. Consequently new inter-connections within the Atlantic Area were not opened up. Indeed the situation of 'losing areas' by 2030 has become severe with the most inaccessible towns, coastal and inland areas deteriorating, their infrastructures quite obsolete, in some instances leading to desertion as minimum services have been abandoned. Further liberalisation of the CAP hastened the decline of agriculture in these areas with the closure of small farms and associated job losses in surrounding outlets.

The structural weaknesses and variation within the Atlantic Area apparent at the turn of the century, distinguishing for example the Greater Dublin Area and its 'Celtic tiger' successes from the underdeveloped western areas of Ireland, has become, by 2030, exaggerated. Without policies in place to mitigate the most painful impacts of a more free market, the attractiveness of Atlantic Area locations to Foreign Direct Investment has been paltry, with some exceptions, such as some areas in the North West of the UK which have remained

attractive for advanced technology. By and large the economic dominance of the core of the EU has been challenged only by a few sectors and dependence on these specialisations has reinforced the supply-side role of the western fringe of the Union.

Economic liberalisation did favour some sectors and areas of the region however. Private-public partnerships have flourished which has re-invigorated other economic activities with commercial viability. These have included marine research centres in France, large hydro-plants, off-shore oil exploration and some isolated wave, buoy and other isolated forms of alternative coastal generated renewable energy. But lacking subsidisation, the renewable energy sector, which had great potential for the Atlantic Area, has not become sufficiently competitive across the board to compete with conventional sources, and thus reliance on the latter, has become, by 2030, the norm. Energy consumption levels in the region have grown, with a continual rise in road transport and maintenance of airline services to Southern Portugal and Ireland. These areas, together with the Atlantic coast of France have retained a significant tourism sector, though this has been largely seasonal in character offering only intermittent employment and as the market in cheap flights to more exotic, distant destinations has increased, the mass tourist sector has declined. Targeted specialist tourism enterprises, such as marine eco-tourism and aqua-sports ventures have attracted private capital though and some of these have prospered.

In congested urban areas air quality has deteriorated. Conversely some vast rural areas have inadvertently been allowed to return to their semi-natural form and this has been complemented by isolated reforestation and conservation initiatives, some of which have been supported by private investment. With respect to the oceans and marine wildlife, the issue has related mainly to what the best response to global environmental degradation should be. The de-regulation of some of the stricter measures of the fishing conservation policy has allowed the fishing sector to retain a greater share of its total catch and value than would have been the case had the tighter controls been kept in place. This has had economic benefits for the region, but the proliferation of profitable intensively farmed fish has had negative impacts on wild salmon, water quality and the ecological balance. The environmental effects of policies promoting economic competitiveness have thus been mixed.

The social impacts of this scenario have also been complex and geographically specific. Attractive areas; both culturally historical centres and rural retreats, have prospered and the lifestyle traditional to the middle classes of Scandinavia, the Mediterranean and formerly – and more recently – Eastern Europe of dividing residence between city apartments and country homes has become widespread, at least for those on higher incomes or in possession of inherited property, as property and land prices have escalated in the most sought after areas. On the other hand the hoped for 'tickle-down' of wealth has by 2030 proved disappointing for many migrant and unskilled workers who have remained largely confined to restricted parts of cities, the sprawling suburbs and towns bordering the agglomerations where insecurity of tenure in employment and rent has intensified competition for work, accommodation and contributed to a growth in tension, property and violent crime.

The enlargement of the EU together with the unremitting rise in energy prices has in some ways exacerbated the marginal position of the Atlantic Area, but there have been compensations. More interchanges between strategically significant coastal capitals and external markets have been evident since 2015 and the supply of energy, mainly nuclear reactors along the West Coast of France and the UK, has been important in maintaining the economic survival of the region as a whole. The other side of the coin is that the amount of nuclear waste has increased. However the move away from 'deepening' the Union has reinforced the recent historical weaknesses of trans-national links and a lack of inter-regional strategies for the Atlantic Area as a whole. Competition between member states

has become the dominant focus and the dependency of peripheral regions on their national capitals been retained. The competitive scenario has stimulated some innovative enterprises and favoured some communities and cities, but at a macro level, it has rather reinforced the marginalisation of the region and its dependence on economic zones better placed vis-à-vis expanding eastern markets.

North-West Europe

Regions which house a high proportion of high-tech industries, universities and knowledge-based companies have fared better than in the baseline scenario. The changes in policy direction have produced a marked diagonal growth corridor, stretching from the Dutch Randstad to Austria, and a perceptible north-south corridor in mid-England. Other areas benefiting in this scenario are the Paris region, Haute-Normandie, Alsace, Nord-Pas de Calais, central Scotland as well as southern Ireland. In general, urbanized regions have tended to benefit more, which places NWE in a relatively favourable position in the European and global context. A few regions showed more modest growth levels, such as the northern parts of Ireland and Scotland and the French rural regions of NWE.

Enhanced economic growth in urban regions has affected transport flows, and consequently decision-making on new transport infrastructures. The increase in economic activity along the above-mentioned corridors has required improved connections, especially along the Rhine and between Paris and the Randstad. The emphasis on market demand in the scenario, however, has produced more plans for motorway connections, than for rail and inland shipping. Specifically, extra lanes have been added to motorways connecting major cities and to ring roads in the 2015-2030 period. Regional airports have developed in the proximity of metropolitan areas, as travel times by road between cities have become prohibitive. The completion of the HST network has done little to alleviate this pressure. Improved accessibility and high prices in cities have caused suburbanization pressures to intensify, blurring distinctions between city and countryside. Commuting between suburbs within an increasingly amorphous urban region has become the norm. As a result, the energy dependency of NWE – already one of the highest in Europe and with the lowest share of energy provided by renewables – has increased substantially, and air pollution could not be sufficiently curbed, despite new technologies of car engines.

Population growth in the NWE area is higher than in the baseline scenario and population ageing less acute. The main reason for this has been the opening of borders to selective immigration. In addition to the global cities London and Paris, European engines like Frankfurt, Brussels and Amsterdam and MEGAs like Dublin and Manchester have attracted many young immigrants at all skill levels. In areas with traditional industries like the Ruhr area and Lancashire, population decline has been even stronger than in the baseline scenario.

Regarding urban growth, the pentagon in NWE has significantly expanded along major corridors, so that by 2030 it even stretches into Dublin. Urban development has become more concentrated in the areas surrounding the European engines and the MEGAs: the so-called PUSH areas. Urban sprawl has increased significantly in metropolitan regions despite rising energy prices with respect to the baseline scenario. This is particularly true in areas dominated by urban networks like the Randstad and the Ruhr area. Immigration into NWE has concentrated particularly in the global cities and European 'engines'. Although the integration of immigrants 'in the marketplace' is relatively high, increasing territorial segregation is apparent. This is particularly true for low-skilled and illegal immigrants, most of whom have settled in the least-favoured districts of these cities. This has caused overcrowding and housing problems as well social unrest and threats to public safety. Immigrants are less integrated than in the baseline scenario due to insufficient integration policies and the lack of regulation associated with illegal immigration, which has persisted.

Social unrest has developed not only in the global cities but also in the European 'engines' and the MEGAs. In these cities, numerous no-go areas have emerged in inner cities as well as privately protected gated communities.

Rural areas around metropolitan areas have become diversified but very fragmented due to contradictory market forces: recreational quality is desired, but also affordable land for businesses and residences. High-tech agriculture has become a growing sector, acquiring land around transport hubs in the Netherlands, Germany, Belgium, Northern France and England. Because prevention measures were kept to a minimum, natural hazards caused by climate change – especially flooding – have been very destructive. Emission levels from transport and industry have been on the rise since the Kyoto agreement and its successors were only weakly implemented. Consequently, air quality has remained a problem in those metropolitan areas with the highest economic and demographic growth figures, like London, Paris, and parts of the Benelux, despite of technological improvements in car and energy technology.

North Sea Region

In the competitive scenario, port activities have shown a renewed vigour, with remarkable growth rates being seen in all the major port cities up to 2015. This scenario has clearly favoured urban areas; growth levels increased almost linearly with population density. Yorkshire and north Scotland showed some signs of decline with respect to the baseline scenario, as did rural areas in northern parts of the Netherlands and north-west Germany, but to a lesser degree. All in all, however, the competitive scenario has been relatively advantageous to the NSR even as compared with the baseline scenario, which was already quite favourable. In addition, as the Baltic member states gained in economic importance, this provided additional demand for goods, which could easily be shipped via the North Sea. Nevertheless, much of the additional growth has been achieved in services and creative industries rather than traditional industrial or logistic sectors, contributing to the prominence of the larger towns in the NSR. Consequently, by 2030, the restructuring towards a knowledge-based economy has been more prominent relative to the baseline scenario.

The mixed levels of economic growth in the NSR have had spatial ramifications. First of all, the stimulation of economic activity in urban port-related areas has intensified those spatial developments identified in the baseline scenario. There has been increasing freight traffic on roads and over the water, and increasing road passenger traffic, especially around airports. Congestion increased in the short term, as governments scrambled to provide new infrastructure to meet the new demand. Meanwhile, traffic jams on the roads in the pentagon have proven to be a mixed blessing for the North Sea ports. The decreasing accessibility over land of ports as logistical nodes could be compensated for somewhat by intensified short-sea shipping, and in some cases by coastal airports.

Population growth in the NSR has been higher than in the baseline scenario and population ageing has been lower. This is particularly true in MEGAs like Edinburgh, Amsterdam and Copenhagen, where the knowledge economy burgeoned, and in attractive rural areas, like the coastal areas near York, Brugge, The Hague, Esbjerg, Oslo, and Göteborg, where many 'knowledge workers' settled. In some peripheral areas, such as central Scotland and the inland areas of south-west Sweden, the population increased more rapidly than in the baseline scenario, whereas rural areas like Lincolnshire, Groningen, and Jutland saw a relative fall in population. Metropolitan areas were the main locus of demographic development. The MEGAs and urban agglomerations with regional importance, like Aberdeen, Kiel, and Trondheim, have extended their influence into their surrounding regions. New high-tech jobs are located not only in core cities but also in the surrounding areas where the most important resources and production factors became easily available.

Port cities, for instance Hull, Newcastle and Bremen have been more negatively affected than in the baseline scenario. The same is true for peripheral areas, like the inland areas in the south-west of Norway and Sweden. Although immigrants became increasingly integrated in the labour markets, spatial segregation intensified. The influx of relatively low skilled people in seaport cities like Antwerp, Rotterdam and Hamburg aggravated existing housing problems. Insecurity and social unrest increased in these cities, despite the proliferation of electronic surveillance and security systems. Suburbanization has been significant in this scenario, particularly around the MEGAs. This has been caused not only by growing economic activities but also by increasing social tensions and decline in environmental quality.

Agriculture has evolved into a more competitive sector on the world market. Specifically, intensive agriculture has flourished in densely populated areas around transportation hubs, such as the Randstad. Despite EU regulations, nitrate levels are also on the rise because of this intensification process. The response to increased flood frequency due to climate change has been to raise the level of river dikes along the Rhine, Elbe and other rivers in the area. As with the baseline scenario, this did not stop the trend towards more floods, since water discharge peaks were historically high. Urban sprawl has been most prominent around the large metropolitan areas. Recreation pressure has increased along all southern coastlines of the North Sea. In both areas, natural and cultural landscapes have become further fragmented, or disappeared altogether. The Natura2000 goals haven't been realised since many conflicts arose with economic interests; increased fishing activities and gas and oil extraction took place in Natura2000 areas like the Wadden Sea. At the same time, technological developments made wind energy more profitable, leading to large wind energy parks in the open sea.

Northern Europe

The impact of the drive for greater competitiveness across Europe has not been uniform across Northern Europe. In demographic terms, the Northern Periphery area and the southern shore of the Baltic both see continuing population decline, as economic opportunities aggregate towards urban centres and, in Poland and the Baltic States, rural areas continue to shed population as the agricultural sector is comprehensively restructured. The Nordic capital regions on the northern shore of the Baltic however, experience a significant influx of people – though not to the city centres themselves – which remain beyond the financial means of most newcomers. A limited number of urban areas beyond the Nordic capital region core, such as Oulu, Umeå, and Trondheim also benefit, given their advantageous positions in terms of high-tech industrial development and/or port facilities and transportation. On the southern Baltic shore, western emigration continues, but at a lower level, as internal economic development proceeds, while, after further EU enlargement in the 2020s, countries like Poland themselves become the recipients of a significant influx of new labour from the east. Significant migration into the largest agglomerations and urban centres on the southern shore of the Baltic, such as for example the tri-city area (Gdansk, Gydinia, Sopot – an agglomeration with close to 1m people), Tallinn, Riga and possibly also Szczecin and Rostock, continues. Resorts on the southern and eastern shores of the Baltic benefit from changes in the choice of tourist destinations, which now attract an increasing number of guests and provide significant employment opportunities for people leaving the rural areas of Pomerania etc, thus reducing westward migration trends and facilitating economic restructuring.

Economically, the 'competitiveness drive' privileges urban over rural areas, as the 'equalisation' ethos of the cohesion scenario is replaced by a focus on emphasising 'indigenous potentials', which effectively reinforces already strong economic areas at the expense of weaker ones. Similarly, high-tech sectors and their ancillary service partners are stressed at the expense of traditional industrial production – though some 'traditional'

sectors such as mining do survive and indeed prosper in the northern periphery area in particular. Economic growth remains above the EU average for both the Nordic capital areas and the countries on the southern shore of the Baltic, though the latter continue to suffer from historical problems relating to (mis-)development and inadequate indigenous investment, with FDI taking up the slack. The impact of this on the development of metropolitan areas is significant across Northern Europe as at its northern and southern extremities a profound 'shake up' occurs, with a spatial differentiation immediately becoming apparent between urban winners and losers – based on their ability to succeed at economic restructuring. Regional disparities therefore dramatically increase in comparison with the baseline scenario.

Similarly, the impact on the agricultural sector is also significant, as the weakening of the CAP, combined with global agricultural 'liberalisation' in the WTO context, severely impacts the 'marginal' agricultural areas in central Sweden and Finland and the unreformed agricultural areas of eastern Poland. Commercialised 'industrial' farming of quality consumer-driven products however booms in the agricultural areas close to the Nordic capital regions.

This propensity towards 'urban crowding' has potentially quite significant environmental and transport-related impacts in the areas concerned, as transport and housing endowments are put under significant strain in the Nordic capital regions, while the northern periphery area and certain parts of Poland suffer in that that essential basic services are no longer automatically provided in certain areas due to population decline. Environmentally, emission levels rise as motor vehicle ownership continues to rise, while the pressure on water levels and land for housing construction increases in the Nordic capital areas and in the largest agglomeration on the southern and eastern shores of the Baltic. Meanwhile, as in the other scenarios, energy price rises remain a constant and a mix of nuclear power and 'alternative' energy production in the Nordic countries provides the desired policy mix. For the southern shore of the Baltic, nuclear energy is again stressed, though the new 'eastern' candidates have very significant problems with their antiquated nuclear facilities, which require a major overhaul and massive environmental 'clean-up'. Pressure from Russia, in the form of the emergence of certain unforeseen 'problems' with the gas pipeline also increase dramatically after further EU enlargements.

Alpine Space

The increase in selective external in-migration has mainly boosted the skilled working population of agglomerations in the Alpine lowlands, such as Munich, Vienna, Milan, Turin, Lyon and Geneva. These metropolises have become the economic engines for the whole region. It is here where innovation takes place because private companies have surpassed even public expenditures on R&D. Strong industrial branches (engineering, technology, informatics) have become more specialised, competitive, and successful on the world market. The growth of GDP per person in comparison to the baseline scenario has been considerably higher in the Alpine regions and Alpine foothills of France, north-west Italy, the region of Munich and also Slovenia, whereas more modest additional growth has been witnessed in Austria, southern Germany, north-east Italy and the Aosta region. Thus, Tyrol and the Vienna region have lost the most economic importance in comparison with the baseline scenario, whereas the French Alps, the Rhone Valley, Liguria, the Po Valley, and also Lombardy have caught up.

The agglomerations in the Alpine foothills; with Munich, Lyon, Nice and Milan in the forefront, have also developed a very strong service sector offering many additional jobs. To maintain the activity rate and compensate for the lost base of young people of working age, high-skilled workers were obtained from outside the EU, and the retirement age was increased. In the core cities, and also in the sub-centres of the agglomerations, social

tensions between nationals and different groups of poorly integrated foreign population, as well as between rich and poor have culminated. Reactive management of these problems has not been able to prevent local riots (Lyon, Milan) and a rise in crime and no-go areas in larger cities. Gated communities have become a standard in the suburbs and in the Alpine vacation home villages.

The smaller the cities were in 2000, the less they have grown up to 2030. Thus, the imbalance between regional centres in the Alps and the agglomerations in the Alpine foothills has sharpened. Whereas the ageing of the population in cities has been alleviated by selected young external in-migrants, most peripheral villages and towns in the Alps have suffered a substantial increase in average age. More than in the baseline scenario, the remoter regions in higher altitudes and valleys with insufficient accessibility have witnessed a sharp decline in infrastructure maintenance (schools, hospitals, public transport, etc.) and a loss of quality of life. Consequently, young people and families have left these regions and have settled in or near to the economic centres. In the already urbanised Alpine lowlands, this process has led to uncontrolled urban sprawl and continued suburbanisation. Large surfaces with a high potential for agricultural use have been sealed, and the depletion of the environment has sharpened. Regular flooding in the valleys and in the lowlands as well as avalanches and landslides have damaged buildings and infrastructure, thus further diminishing the useable surface for settlement purposes.

Biotopes have been destroyed and the landscape of the Alpine foothills has lost its image. Indoor recreation facilities and extravagant shopping malls have replaced outdoor activities. As no new regional natural parks have been established due to the lack of public funding, private investors and tourist associations have further commercialised the landscape, using the Alpine scenery as an optic background for large amusement and leisure parks along highways. Eco tourism has developed only slowly. Also, the snowline has further receded and Alpine winter sport resorts are forced to compete with those of Scandinavia and overseas. The concentration in urban areas has increased the problems of air quality, noise, and congestion. The answer was to enforce stricter emission levels and invest in new roads and railways: TEN-T has been realised but due to continually increasing traffic, the situation has not radically changed. The Kyoto agreement and its successors have failed and climate change has accelerated. As the demand for individual and freight transport has increased more than in the baseline scenario, the transit axes Munich-Milan, Basel-Milan and Lyon-Turin are nearly always congested. Although accident-prone, new railway tunnels have facilitated trans-Alpine connections, and turned Gotthard, Brenner and Mont Blanc into the most important convergence points of the European north-south flows. Capacity problems have however emerged.

Large parts of remote Alpine areas have been literally abandoned as public funds have been redirected from regional policy to expenditures on infrastructure, education, ICT and the external accessibility of the most competitive areas. Also agriculture has not been able to create jobs in the Alps as CAP and Swiss agricultural policies have exposed the farmers to the liberalised market, and subsidies and direct payments have been completely abandoned. This has accelerated structural change in agriculture, resulting in the nearly total abandonment of small holdings and a high concentration on energy intensive large agro-industrial farms in the flatlands. As food production has not been able to compete with industry and private home building enterprises for scarcer land, high-tech multi-storey off-soil production has been introduced. This efficient kind of food production has resulted in lower food quality, not for the benefit of biological products from Alpine regions but for increasing imports from the Americas and Asia. Another agro-industrial branch that has developed in light of ever increasing oil prices is the production of bio-fuel on large-scale farms at the base of the Alps. On slopes with southern exposure, large solar energy installations with a high degree of efficiency have been established, thus complementing the production of photovoltaic energy that has already transformed the image of agglomeration

cities in Switzerland and Austria, where nearly each roof is covered by solar panels. Wind energy plants have been built and geothermal test drillings have been made. Hydroelectric power has remained the most important source for electricity production, although the retreat of glaciers and scarcer but heavier rainfalls, have limited its extension, potentiality.

Central and Eastern Europe

The competitive scenario affects Central and Eastern Europe distinctly from other European macro-regions in at least two respects. First, the development of the countries of CEE in the period 1990-2005 was largely determined by factors of competitiveness (in contrast to the EU15, where cohesion considerations played a substantial role both at EU and at national level). Therefore the competitive development scenario for this area can be defined as a continuation of these trends and factors. Second, Central and Eastern Europe is at the forefront as far as further EU enlargements are concerned. The heterogeneity of the European Union has further increased.

In CEE, population decreased everywhere up to 2030, even more than in the baseline scenario, with the only exception of Albania. The strongest declines were experienced in the Baltic States, Hungary, Romania and Bulgaria. The change was due partly to the natural population movement but mainly to international migration. The expected improvement of total fertility rates did not take place, or improvement was much more modest than expected. Job security and confidence in the future are important factors for fertility, and economic security did not increase substantially in the peripheral territories of the EU, and even less in the countries outside the EU. Until 2015-2020, Central and Eastern Europe was one of the major sources of migration to Western Europe. After this time, however, the Eastern member sates became also destinations of immigration. Differentiation in demographic trends increased also within the countries themselves. Population decline was especially strong in rural areas within the countries. The population of large cities and their agglomerations increased more rapidly. Parallel with the dramatic decline of the total and rural populations, the population of large agglomerations continued to increase. The decline of population affected seriously the economy of the respective countries. The out-migration of skilled labour caused labour shortage in some countries (in the Baltic States and Romania it was felt already in the early 2000s). Since skilled labour is a key condition of foreign direct investment, its shortage spoilt employment opportunities for a much larger number of less skilled people. Maintaining public services in areas with declining population became more costly and less efficient. Depopulation affected different types of settlements differently. Large urban housing estates, accommodating nearly 50 percent of Eastern European urban populations have lost most of their former dwellers. Small rural settlements far from large urban centres and outside the attractive tourist areas were left by almost their entire active population, only elderly people remained, with limited access to social care and public services. Abandoned housing blocks were occupied by illegal migrants and other deprived groups of population (Roma, etc.).

The economies of CEE were further restructured: material-, energy- and transport-intensity of the economies decreased. The share of services in the GDP further increased. Economies became more open: the volume of exports and imports increased more rapidly than that of production. Beside these positive features of development, some serious structural weaknesses and economic problems remained. The carrier of growth continued to be almost exclusively foreign direct investment. Increasing FDI was very beneficial for the countries, but especially in the case when it gave an impetus to local suppliers and utilised local human, natural and service resources. FDI and growth continued to be restricted to metropolitan regions, mostly to capital regions, western border regions and major ports. Development slowly spread to other regions. Regional disparities increased. The most dynamic sectors, the motors of growth, were trade, commerce, tourism, real estate and financial services. On the one hand, this was necessary, because these sectors were

underdeveloped in the former centrally planned economies. On the other hand, a major disparity between these sectors and industry and agriculture jeopardised competitiveness and equilibrium. The gap between large enterprises (owned mostly by the state or foreign investors, with highly mechanised, high-tech plants) and very small "micro" enterprises, owned by local people increased, while strong and competitive small and medium-sized firms continued to be underrepresented (at least in less developed regions). In close causal relationship with the former problems, employment did not increase parallel with the dynamic growth of GDP and unemployment remained rather high in most countries and regions of the area. But unemployment was only one symptom of underemployment. The more serious problem was a low activity level, inherited from the dramatic decrease of activity rates between 1990 and 2005: many people retired early; many women left the labour market; others gave up the hope of finding a job and therefore did not register as job-seekers any more. Without raising the activity level it was impossible to catch up with the more advanced countries. Finally, economic and trade relations remained unbalanced. Their trade continued to be concentrated on one or a few large developed countries (Germany, Italy) and trade relations among them remained at a rather low level.

In Central and Eastern Europe, many people returned to the rural areas during the 1990s, when traditional industries and public jobs collapsed, in the hope of ensuring their existence and making a living in private (in Poland) or re-privatised agriculture. In many cases, these hopes turned out to be vain and unfounded. Already in the 2000s, many people abandoned agricultural activity, but remained in their rural residences. After 2005, while CAP support declined and was shifted towards Pillar 2, an equalisation took place between western and eastern farmers. Despite the relative improvement of the situation of eastern ones, eastern agriculture – because of its mere size – released many more people than the west. By 2030, agricultural employment was reduced to a third or quarter of the share of the early 2000s. Agricultural overpopulation was a serious problem also in Greece (Traki, Kriti, Peloponnisos, Dytiki Ellada). The liberalisation of agricultural trade affected seriously numerous CEE regions, because their production structure was very similar to that of the main non-EU competitors. The large scale loss of jobs in agriculture was more intensive where large farms were the dominant form of enterprise. Small farms – and the direct support of the EU – constituted a buffer against open unemployment. Mecklenburg, Brandenburg, North- and West-Poland, Slovakia, the large Danubian plains of Hungary, Romania and Bulgaria were the most critical regions in this respect. At the same time, these large – and cheap – agricultural lands attracted numerous farmers from Western Europe (Netherlands, Germany, Austria, Denmark, Sweden) to buy or rent land there and establish large farms.

Between 2015 and 2030, agriculture and rural areas underwent substantial progress towards a dual system of economy. In fertile areas and/or close to the main consumption centres (agglomerations, tourist areas) large scale, highly mechanized agriculture developed, employing very few people. These large farms could stand the pressure of global competition. Large farms already dominated in the Czech Republic, Slovakia, eastern Germany, western and northern Poland. After 2010 a rapid concentration took place also in Hungary, Romania and Bulgaria and in some areas in eastern Poland. These farms produced the majority of agricultural products. Less fertile or less favourably located areas – especially those, dominated by small farms – became increasingly marginalised by external competition. The luckiest of them could change the profile of their activity (rural tourism, traditional handicrafts, organic farming, or simply keeping the land in good condition and living on subsidies). A reverse development in the distribution of rural population occurred: more fertile areas had a lower, while less fertile areas had a higher density of the agricultural population. Despite the reduction of subsidies, agricultural population density remained high in areas where no other employment opportunities emerged (Southeast Poland, Northeast Romania, Southeast Bulgaria, Ipeirow, Peloponnisos, Kriti, Calabria, Galicia). In some cases, high density facilitated the development of small businesses linked to important transport corridors (like in South-Eastern Poland).

"Dualisation" in rural areas became more accentuated. Population density in the rural areas around the Baltic sea (mainly in Mecklenburg-Vorpommern, North and Central Poland and in the rural areas in the Baltic States) diminished radically and a highly mechanised grain production and animal husbandry emerged. The same happened in the Danubian Plains (Austria, Hungary, Slovakia, Romania, Bulgaria). In the mountainous areas of the Alps, Carpathians, and Sudetes, where mechanised agriculture was less possible, part-time agricultural activity and subsistence farming survived to a larger extent. In the vicinity of larger urban agglomerations, intensive horticulture, greenhouse production and animal husbandry developed. Land prices converged between the western and eastern member states, but they still remained lower in the east. That was one of the factors that supported the competitiveness of eastern agriculture. The other was the radical increase of farm size and the radical decrease in the number of farms. It meant, however that in the new member states about 10 million "jobs" were lost in rural areas, and only a fraction of them were compensated for in other sectors. The largest rural losses of jobs were experienced in Romania, Bulgaria, and Poland and in the Baltic States.

The evolution in the energy sector has been rather paradoxical. The energy intensity of the productive system has significantly diminished, pushed by both the giving up of obsolete industrial activities and investments in energy savings in modern production plants, mainly in large agglomerations. New generations of nuclear power plants have been built. The modernisation of energy systems in the residential sector and in rural areas was much less spectacular. In the less developed rural areas, traditional biomass-based heating systems were maintained. In more fertile areas, the intensive cultivation of energy crops was pushed by foreign investors or by large multinational energy companies concluding long-term, but rather unfavourable contracts for farmers. The whole potential of renewable energy is by far not exploited, because of the lack of EU support, especially in less developed regions. The increase of motorisation and of traffic density has offset a part of the benefits of energy savings in the productive sector.

Southern Europe

The opening of external borders, even on a selective basis, has been the most important driver of demographic development in Southern Europe. The regional impacts are however very contrasted. While regions with important metropolitan areas or zones with attractive living conditions –mainly the tourism development ones- have benefited from the influx of new immigrants (mainly from North-Africa and Turkey), the more rural and remote regions were affected by strong population ageing, even more than in the baseline scenario. This is particularly the case for the regions of northern Spain, southern Italy and southern Portugal. By 2030, the demographic potential is still strong in southern–France, Cyprus, Crete and western Peloponisos in Greece and northern Portugal and, to a lesser extent, in some parts of the Spanish Mediterranean coast as well as in the Balearic Islands.

In economic terms, growth is stronger than in the baseline scenario, but much more polarised in already developed regions with metropolitan areas and large cities. The regions which have improved their position in comparison to the baseline scenario are primarily those of northern Italy and south-eastern France which all together represent a quite competitive cluster with significant technological functions, as well as more isolated metropolitan regions (Lazio, Madrid, Attiki) and to a lesser extent the regions of Lisbon, Porto, Catalonia, Valencia and Campania. The EU enlargements as well as the Neighbourhood Policy have significantly facilitated the relationships of Southern Europe with the southern Mediterranean countries.

Large port cities (Malaga, Valencia, Barcelona, Marseille, Genoa, Piraeus/Athens) have benefited from the increase of intra-Mediterranean and also global trade, an evolution which

has favoured the development of their service functions. Tourist regions have remained prosperous, despite a number of constraints such as the increase of transport costs and problems of water and energy supply. The strong influx of legal and illegal immigrants has however favoured social and spatial segregation in large cities as well as a climate of insecurity, leading to the emergence of gated communities. Densification along the coastal strips has continued. Small and medium sized towns specialized in residential economy, tourism, recreation, cultural activities, health care etc. have remained attractive and have therefore expanded.

As opposed to this, the situation in remote and peripheral or mountainous rural regions has significantly worsened, compared with the baseline scenario. In numerous of these regions (northern Greece, northern Spain, Sardinia, Corsica etc.) population ageing has reached alarming levels and younger qualified people have moved to large cities or tourist regions. The level of public services has severely deteriorated and basic infrastructure is no more supported by structural policies. The lack of prevention measures has increased the impact of natural hazards, especially forest fires and sometimes flooding. The productivity of agriculture in non-irrigated areas has declined because of sustained drought. Agricultural land has been abandoned in numerous regions. In irrigated areas, on the opposite, agricultural production has intensified. This does not exclude that a number of rather attractive rural areas have achieved to diversify their economy, drawing advantages from the residential economy (settlement of retirees) and from tourism based on the natural and cultural heritage. The new external border regions, which are essentially rural in character, are particularly disfavoured.

In the context of increasing oil and gas prices, investments have been made to ensure in priority the energy supply of large cities and developed regions. New nuclear power plants have been built, causing political tensions. Large-scale energy plants using new technologies have also been developed, aiming in particular at producing large quantities of hydrogen. Technologies using solar energy have been promoted, mainly in developed regions, with the support of European funds. The situation is much worse in rural areas, because the possibility of producing biomass for energy supply purposes is constrained by drought and by the lack of EU support. The evolution of energy supply strengthens therefore the polarisation between developed and less developed regions.

Numerous factors have contributed to the deterioration of the environmental situation, such as the progress of suburbanisation around large cities, the densification process along coastal strips, the lack of prevention measures against forest fires and flooding, the abandonment of agricultural land and of remote villages, the increase of traffic, even if some factors have been acting in the opposite direction (introduction of less polluting car engines, development of solar energy, introduction of the hydrogen technology with numerous applications etc.). Tourist development and growing demand for second homes combined with the growing immigration pressure mainly in metropolitan areas (more than in the baseline scenario) have supported the continuation of the development of the construction sector.

Spatial integration both in the entire southern European area and in its western and eastern parts taken as discrete entities has been intensified less than in the baseline scenario. The Pentagon has been expanding towards the rest of northern Italy, a part of southern France and a part of northern Spain. This expansion concerns by far the important metropolises. In the central and southern part of the Balkan region spatial integration has generally progressed less than in the baseline scenario. It has however benefited more from networking relationships among the important metropolises of the region: Athens, Thessalonica, Sofia and Bucharest and to a lesser extent the capitals of the Western Balkans countries.

Areas with low population density

Under competitive assumptions, population ageing by 2030 is less strong than under baseline assumptions and the demographic potential therefore stronger. This results mainly from an influx of immigrants with a younger median age. This evolution has slowed down global population decline and has had a positive effect on small and medium-sized urban centres, which does not exclude stronger emigration from the more remote areas.

In the economic field, the evolution has been the reverse, with weaker dynamics up to 2015 than in the baseline scenario. The priorities allocated to metropolitan areas and the strong reduction of support from structural funds and the CAP had detrimental effects on the exploitation and enhancement of indigenous resources, including tourism. The relative economic position of these regions in 2015, in relation to the European average, is worse than in the baseline scenario. After 2015, the trends are likely to continue and reduce the relative competitiveness of these regions.

Compared with the baseline scenario, there has been no significant difference in infrastructure investments in these regions. In terms of Europe-wide accessibility, they have indirectly benefited from important improvements in transport infrastructure and services related to the large cities of the northern Baltic coast. This explains why their Europe-wide multi-modal accessibility and their accessibility to GDP, in less than 10 hours, are somewhat higher than in the baseline scenario.

The strong decrease of EU support has affected the exploitation of certain types of renewable energy sources, as well as investments in tourist infrastructure outside the most attractive places. Tourism is therefore spatially more concentrated than under baseline assumptions. As no specific prevention measures were taken, forest fires have increased during hot summers, destroying a part of traditional forest landscapes.

Mountain areas

Under competitive assumptions, the evolution of European mountain areas has been for the most part less favourable than under baseline assumptions, not only in more peripheral mountain regions, but also in the more developed, central ones.

Traditional economic activities (agriculture, forestry, handicraft, traditional industries) which benefited for a long time, at least for some of them, together with the support of public policies declined. This process was thus worsened by the sharp reduction of CAP and structural policies, contributing in turn to an acceleration of the demographic decline seen in numerous mountain areas and inevitable population ageing. While the liberalisation of immigration was of benefit to large cities in the lowlands, it was of no help to the small and medium-sized cities of the valleys and piedmonts, and even less to the mountain villages. Demographic decline has been significant in the mountain areas of Southern and Eastern Europe, more modest though in the Alpine and Nordic mountain areas. The most attractive mountain areas have even benefited from new forms of residential economy and from tourism. The impact of climate change on winter tourism has however been similar to that under baseline assumptions, with shorter seasons and diminishing of activities in lower altitudes. Winter tourist activities have therefore concentrated in a few high-altitude sites and in Nordic mountain regions.

The numerous mountain regions affected by declining activities (agriculture, industry, handicraft, tourism) have generally not been in a position to develop sufficient substitution activities because of the lack of support from public policies. Unemployment and emigration have thus increased. The large cities and metropolitan areas in the lowlands had a reverse evolution. They have benefited from favourable market forces related to the globalisation

process and, in addition, from the support of EU policies in R&D and technological development. They have therefore extended their influence over the mountain areas; which have become more dependent and less resistant than they were before. This process has however not been uniform everywhere due to the wide diversity of the situation of mountain regions in Europe.

The regional/local accessibility of numerous mountain regions, which is dependent upon efficient secondary networks, is worse under competitive assumptions than under baseline ones. The Europe-wide accessibility of mountain regions very much depends upon their location with regard to large cities and major European transport axes. Those whose area is favourably located in relation to these elements have in some cases a better position in 2030 than in the baseline scenario.

As far as energy is concerned, the development of new renewable energy sources is far less significant than in the baseline scenario because of the lack of support to less developed regions by EU policies. With declining hydro-power capacity and biomass production, especially in Southern Europe, the energy supply of most mountain regions is more dependent on outside (fossil energy sources and nuclear electricity) sources.

The negative impacts of climate change have not been limited to the tourist sector. The lack of prevention and mitigation measures have resulted in increasing damages caused by flooding, land slides, drought and forest fires.

Ultra-peripheral regions

Under competitive assumptions, most UPRs are in 2030 in a much worse situation than they were in the early 2000s. The main factors of change have been the weakening of structural and CAP policies in a context of strengthened liberalization. Compared with the baseline scenario, the number of jobs in agriculture and other indigenous activities has strongly declined. Support for the maintenance and development of infrastructure and services of general interest has been progressively but substantially reduced, generating a trend towards obsolescence and insufficient supply. Only where investments in world-oriented mass tourism were profitable, were jobs maintained or developed. It has not been just qualified people who have migrated towards mainland Europe, but also numerous other people in search of jobs. Due to sharply increasing unemployment rates, social unrest has become a basic problem and illegal and criminal activities (smuggling, trade with drugs and weapons etc.) have strongly developed in most UPRs. Insecurity has seriously increased, not only in cities. Through the liberalized immigration policy, a strong influx of immigrants has been using the UPR as a first step towards mainland Europe. It has been necessary to develop in these regions specific infrastructure and services for the transit of immigrants. Due to a lack of support from structural funds, the potential of these regions in the field of renewable energy sources has hardly been exploited. Dependence upon fossil energy sources has therefore increased, with a weakening impact on the economy. Preventative measures against the impact of natural hazards were hardly implemented, so that serious damage has frequently been caused.

4.2.6 Territorial issues arising from the competitive scenario

Europe-wide level

Despite stronger economic growth at global European level, territorial disparities in the competitive scenario are much stronger, by 2030, than in the baseline scenario. The divide between Western Europe and Central and Eastern Europe has increased, because growth tends to concentrate in the pentagon and in only a few metropolitan areas outside of it. The

further EU enlargements have added to this divide. New global integration zones have not emerged and the domination of the pentagon has increased. The divide in Europe-wide multi-modal accessibility between the pentagon and more peripheral regions has not been reduced, on the contrary, as transport policies have favoured the development of corridors between large metropolitan areas and as a result of the intensification of energy process, the scenario has been more detrimental for peripheral regions.

Intermediate level

The divide between metropolitan regions and rural regions has strongly increased, both in Western Europe and in Central and Eastern Europe. Territorial integration has progressed in the form of long-distance networks and co-operation between metropolitan areas, but is much lower in rural and border regions than in the baseline scenario. The competitive scenario generates more territorial fragmentation. Numerous rural regions are facing an abrupt spiral of decline (depopulation, negative impacts of drought, low competitiveness of enterprises, insufficient public support).

Local level

The global competitiveness of metropolitan areas is stronger than in the baseline scenario. The internal differentiation of cities (gentrification and gated communities on the one hand; slums, housing shortage, insecure areas, insufficient socio-cultural integration of minorities and people of immigrant origin on the other) is stronger than in the baseline scenario. Suburbanisation is strongly progressing around metropolitan areas. In rural areas, numerous small and medium-sized urban centres have lost their vitality and are no longer in a position to supply the surrounding countryside with services and jobs.

5. Downscaling the scenarios

Our scenarios provide a general vision of possible evolutions of the European policies and territory, with a territorialisation at the meso-scale represented by the Interreg 3B areas. As the scenarios had to cover the entire ESPON space, it was obviously not possible to provide sound prospective images for the micro-scale, i.e. the national to local levels.

However, three different attempts were made at providing such "downscaling" for selected case study regions and using different methodologies. We briefly summarise the results here. For more details, please see Vol. 4 Chapter 5.

5.1 Demographic developments in a large metropolitan area

The first method is an application of the index of sustainable development at regional and local scale, in this case the central part of the region "Ile de France" (Figure 35). Within the area composed of Paris and its neighbourhood, we can observe in the baseline scenario (prolongation of actual trends) the opposition in terms of life expectancy between the wealthy towns of the south-west (Hauts-de-Seine department) and the poorer cities of the north and the east (Seine-Saint-Denis department). The radio-concentric geographical polarization observed on the maps of Figure 35 corresponds to the classical socio-economic disparities put forward by many researches on Ile-de-France. This north-east/south-west opposition is particularly important in the case of the competitive scenario, which is based on a β-divergence assumption (hypothesis of increasing fragmentation within metropolitan areas, with the reinforcement of the social polarization in urban spaces). In the cohesive scenario, this polarization is less important, because of the more developed social policies.

ISDD in 2030 in the "petite couronne" of Ile-de-France (Paris, Hauts de Seine, Seine Saint Denis and Val de Marne)

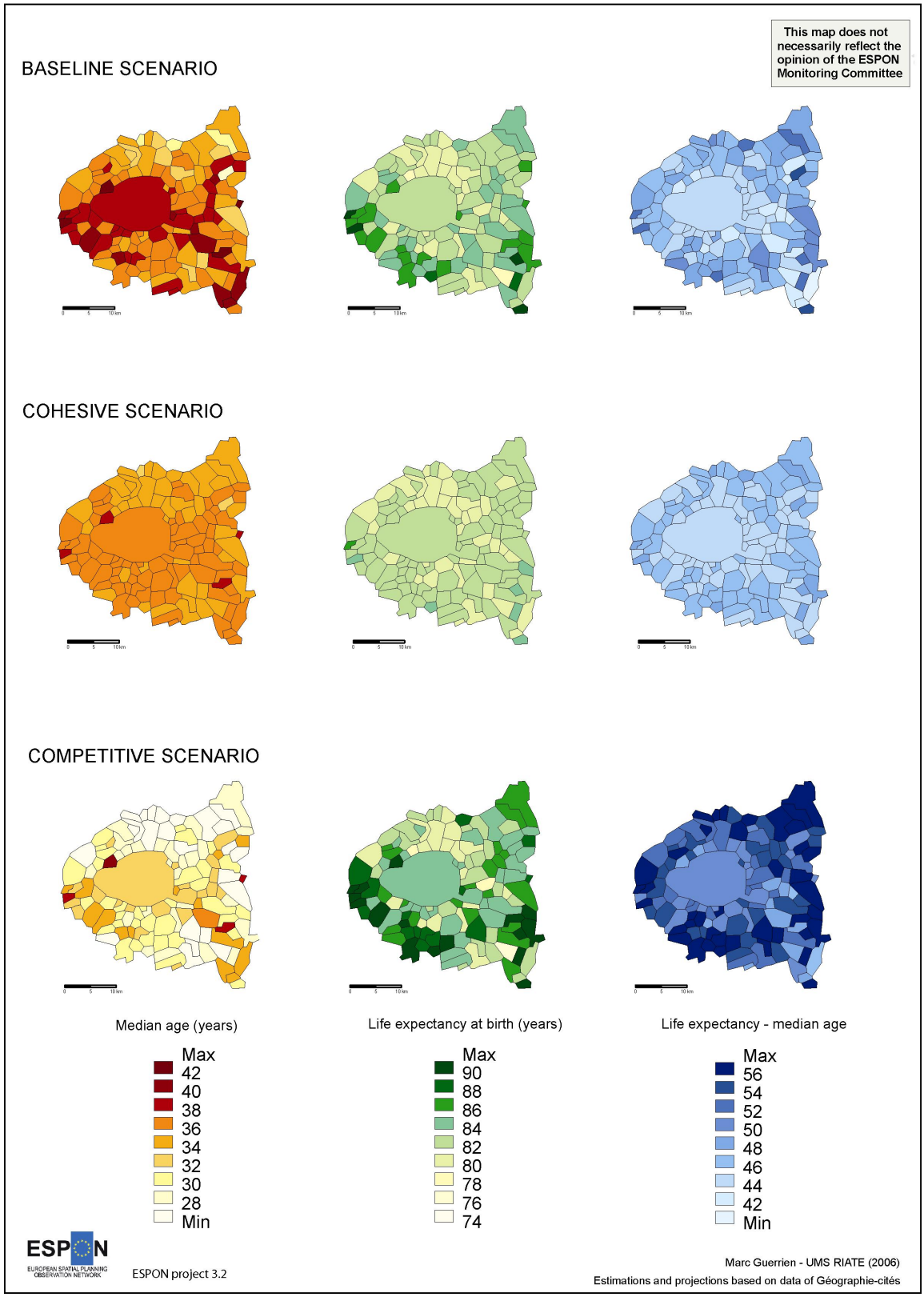


Figure 35 ISDD in 2030 in the "petite couronne" of Ile-de-France (Paris, Hauts de Seine, Seine Saint Denis and Val de Marne)

5.2 Access to services: a local issue

The second approach also concerns the social perspective, the access to services, represented here by maternity hospitals. The accessibility indicator combines three dimensions: the supply in terms of beds-day availability per hospital; the demand in terms of number of births per LAU, and the time-distance between each LAU and the maternity hospitals. The measure is tested with the example of the Grande Région (Lorraine-F, Luxembourg-L, Rheinland-Pfalz-D, Saarland-D, Walloon Region-B).

According to the general hypotheses of more public intervention in the cohesion and less in the competitiveness-oriented scenario, the following hypotheses were used for this exercise:

Cohesion-oriented	**Competitiveness-oriented**
hospitals cluster to take advantage of the better and more diversified services of large units	smaller hospitals whose profitability is not ensured (less than 30 beds) are closed, except when no other hospital remains in the neighbourhood to provide a minimum service level
new maternity hospitals are more likely to be established in deprived areas	no new hospitals
women who live near national borders will use maternity hospitals on either side	women can go to a maternity hospital on the other side of the border

Figure 36 presents the results. In the cohesion-oriented case, the most striking element is the gain in accessibility from the creation of new maternity hospitals in the Walloon and French rural territories, while there appears to be some loss in the German urban territories. The dark blue colours are only located in the LAU where a maternity hospital has been closed – the situation of these LAU is not dramatic as the closure has taken place to create larger units in the vicinity. This leads to a new balance through a transfer from the over-furnished zones to the derelict ones. Such a movement is an expression of solidarity between the territories, providing an illustration of what could be the "territorial cohesion".

In the competitiveness-oriented scenario, a general loss in accessibility has occurred in the significant number of LAU which are shown in light blue. However, the darker blue pattern of the LAU which have lost a maternity hospital (red crosses) does not signify a catastrophic situation because other hospitals remain in the vicinity (condition for the closing). Little gains in accessibility are observed close to the borders, reflecting the possibility to go to a maternity hospital on the other side of the border. Nevertheless, this general restructuring raises concerns about the impact on the environment of the study population.

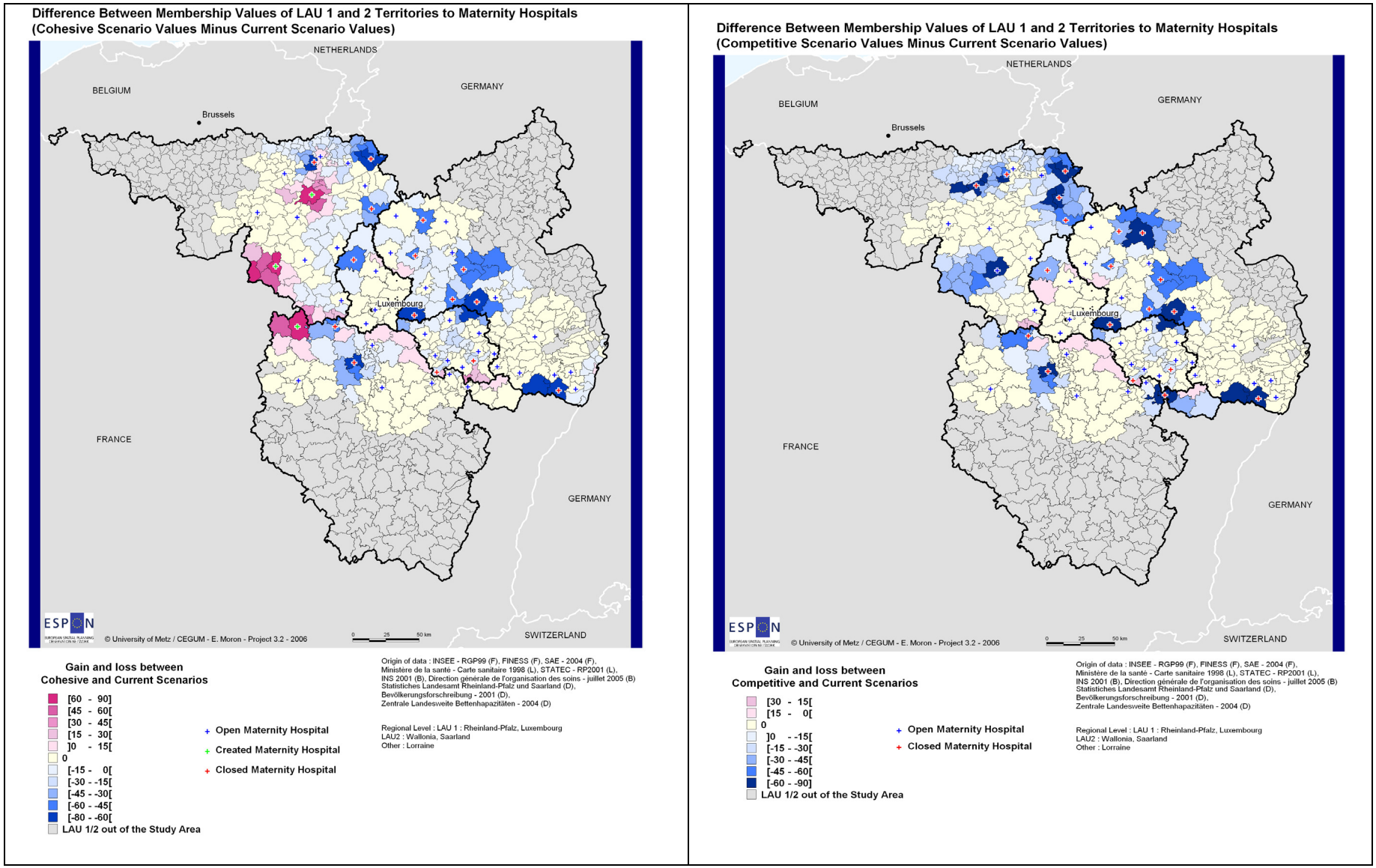


Figure 36 Difference between Membership Values of LAU 1 and 2 Territories to Maternity Hospitals (Cohesive and Competitive scenarios)

5.3 Future land use patterns in a regional development corridor

Towards the end of the project, a contact with the Institute for Environment and Sustainability of the DG Joint Research Centre was established concerning the application of our scenarios to the MOLAND model in order to estimate possible effects on land use of the different hypotheses. The exercise has been carried out for the study area including the cities of Dresden and Prague and the transport corridor between two cities defined by the motorway D8 on the Czech side and A17 on the German side.

The results are extremely preliminary due to the limited nature of the exercise as the project could not provide much of the needed data, except for MASST and KTEN results. However, the outcome shows an interesting potential for future research.

As an example of the type of information provided, figure 3 shows the growth of residential areas by type and by scenario for different cities within the case study area. Generally, Dresden and Prague have the highest growth in the competitiveness-oriented scenario, which, for example, Severozápad has hardly any growth at all. The cohesion-oriented scenario seems to lead to a more balanced growth in residential areas across the different cities.

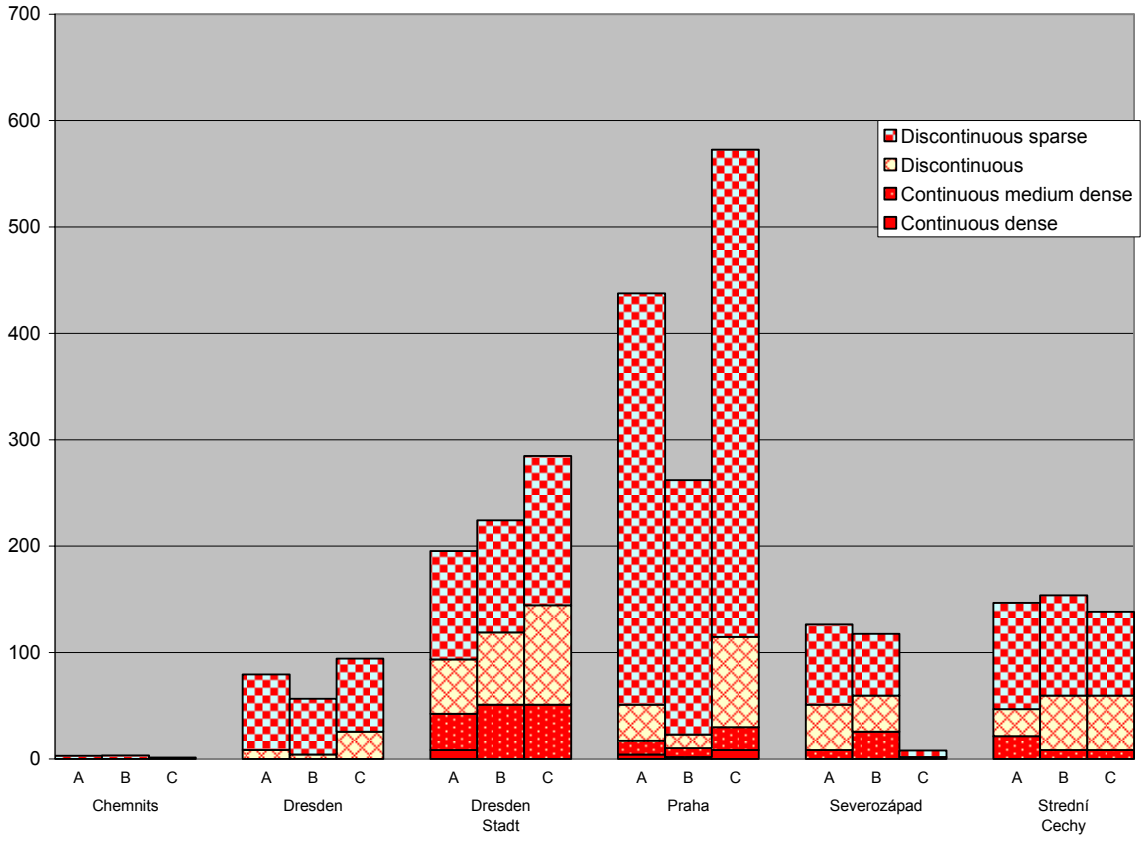


Figure 37 Growth of residential areas by regions for (A) Baseline, (B) Cohesive and (C) Competitive scenarios. Numbers correspond to the numbers of new cells (200x200 meters or 4 ha).

6. Wild cards

6.1 Introduction

The above scenarios explore the evolution of the European territory as a result of specific policy choices. They, therefore, focus on the impacts of these choices on the territory, without taking into account possible other events that might influence this territory, and that might do so differently according to the policy choices made. It would obviously be impossible to imagine and elaborate story lines for all possible events that might occur. We have, therefore, decided to chose four "wild cards" and to very briefly evaluate what the impact of these events would be on the territory in the context of each of the two opposing policy scenarios:

1. An era of energy scarcity: conflicts, peaks and alternatives
2. Without the net – The sad demise of Europe's social security systems
3. The day after tomorrow (revisited) – the Global conveyor belt (Gulf Steam) 'stops'
4. As the bubble explodes, the dollar goes down the drain

The aim of these wild cards is threefold:

- actually evaluate the territorial impact of these events, which are all within the realm of the possible, some maybe even of the probable
- include some reflections on themes that have not been included into the integrated scenarios, notably the themes of globalisation and oil peaking
- raise awareness about the fact that policy choices of today have to be evaluated not only in the light of today's policy goals, but also in the light of possible, sometimes traumatic, events in the future.

For more background information on the reasoning behind and the elaboration of the wild cards approach, please see Vol. 4, chapter 6 "Wild Cards".

6.2 Theme: energy policy

Title: An era of energy scarcity: conflicts, peaks and alternatives

…..***Story line:***

While Iraq is finally plunged into civil war destabilising surrounding countries such as Kuwait and Saudi Arabia, the worsening political situation between Iran and the Western powers further exacerbates market concerns over energy prices. In response to US-led sanctions on Iran in 2017, oil deliveries to the west are blocked or redirected to China, while Venezuela continues its politics of preferential access to its oil for poorer nations. At the same time, many of the major oil fields show signs of oil peaking, while general production goes down. Europe has thus to face a general scarcity of oil while it struggles to find a replacement.

…..***Initial outcome produced by the Energy WC:***
European access to imported Middle-Eastern oil is significantly reduced. Alternatives from Latin America are also harder to come by. Europe's own internal oil reserves are insufficient to cope with the new level of demand, while conservation measures alone will not be sufficient to address the balance. A complete package of new energy initiatives including conservation, efficiency, and substitution measures is put in place as the change to a post-hydrocarbon society has to be managed such that it occurs as quickly and as painlessly as possible.

……Territorial Impacts
At the beginning of the scenario (2005) the average 'oil-use ratio' in Europe broadly conformed to that of the OECD as a whole at 70**/**20**/**10 for motor vehicle usage **/** heating of residences and workplaces **/** powering industry the primary question thus seems to concern motor vehicle usage, specifically the issue of whether hydrocarbon substitutes could quickly be found, though the evolutions within the scenarios could see some alteration in this 'oil-use' ratio, thus impacting on the final outcome. The cost of energy also impacts on manufacturing, distribution and accessibility issues, though of course these costs are rising in any case even before the wild card occurs. How would the two scenarios cope with what in effect would be an unplanned and rather perfunctory end to the hydrocarbon era?

Competitiveness scenario
The major territorial impacts of this wild card are displayed in terms of car use, urban development and industrial restructuring. While the competitiveness scenario saw increased car use up to the 2017 breakpoint – even in the context of rising oil prices – the massive reduction in access to oil after 2017 means that traditional fuel costs now become prohibitive. The competitiveness policy 'endowment' up to 2017 saw increased Europe-wide car use, more effective and efficient heating for buildings and stable industrial use, thus producing a continuing increase in the energy percentage ratio used for motor vehicles. Similarly, the development pressure seen in terms of urban environments in the pre-2017 period is exacerbated thereafter as people are still moving, but now in the opposite direction – back into the heart of the city, where the cost of transport is less of a factor as efficiency gains are still possible in moving large numbers of people. Finally, industrial restructuring continues apace, and higher energy costs simply add to the problems faced by declining, often 'energy-thirsty' manufacturing industries. This problem is further exacerbated by such industries' often peripheral localisation, with higher fuel costs in terms of goods transportation simply making matters worse. Conversely, the newer less-energy intensive high-tech and service industries are not so affected, while the better territorial integration endowment construction before 2017 in the pentagon and in other major metropolitan areas is not lost thereafter.

In general terms then while there can be no immediate 'winners' from such a disastrous wild card we could surmise that it will precipitate a major change in the everyday life experiences of people due to the forced limitation in access to transport. Rural and peripheral areas are particularly badly impacted as tourism, recreation and the setting up of new businesses is affected. In terms of East-West dichotomies, the process of Eastern 'catch-up' is slowed as the manufacturing economies of the East suffer similar problems to those undergoing industrial restructuring in the West. As such then, while the environment is perhaps the only real winner as energy consumption falls, this wild card, generally speaking, simply reinforces the basic trends already witnessed in the pre-2017 period.

Cohesion scenario
In this scenario by 2017 Europe is a very different place from that of the competitiveness scenario above. The Cohesion policy 'endowment' up to 2017 saw rural areas in the core areas of Europe (the Pentagon) undergo a sustained period of economic development due to the cultivation of energy bio-crops while those in the peripheral and outlying areas have

also benefited from a sustained period of economic diversification. Transport policies focused primarily on the question of accessibility issues in remote areas instead of developing further linkages between major metropolitan areas. Economic development in general and production systems in particular then are less 'global' in nature, and more focused on regional and local markets.

As significant Structural Funds have been invested in rural areas, these areas are in a better position to confront this wild card, especially those in the southern parts of Europe who, given their high import needs and low self-sufficiency levels, would otherwise have been most badly affected. The move back to more compact cities that occurred before 2017, moreover made the switch from hydrocarbons to biofuel somewhat smoother. Consequently, small cities in rural areas are not as disadvantaged as in the competitiveness scenario, which saw a much broader divide between the metropolises and SMESTOs. Shrinking metropolises do however affect the overall territorial balance of the European territory.

In general terms, at the European scale, the worse hit areas continue to be the former Socialist countries of East-Central Europe as energy increases have a magnifying affect in terms of regional development with lagging regions hit hardest. By 2017, 'catch-up' has not occurred to any great extent though medium-sized cities in East-Central Europe are better prepared than in the competitiveness scenario. Eastern rural areas remain unprepared and unable to benefit from the biofuel revolution in agriculture. As such then, quality of life continues to be the main winner here, as exorbitant energy costs simply reinforce the original trend for localisation and a decline in the movement of goods and people.

6.3 Theme: Abrupt climate change

.....Title: The day after tomorrow (revisited) – the Global conveyor belt (Gulf Steam) 'stops'

…..***Story Line:***
Most studies on potential climate change have focused on the ongoing build-up of industrial greenhouse gases in the atmosphere and thus on a gradual increase in global temperatures. Recent evidence suggests however that the Earth's climate has repeatedly altered rather more dramatically than such models, dealing with the slow build-up of greenhouse gases for instance, would suggest. Indeed, change has often occurred in time spans as short as that of a decade. As such, abrupt climate change may be more likely in the future. Moreover, such climate shifts do not necessarily have universal or global effects. They can instead generate counterintuitive patterns, where, even as the world as a whole continues to warm gradually, large regions may experience a precipitous and disruptive shift into colder climates.

In a European context, this is thought most likely to occur if changes develop in respect of the *Global Ocean Conveyor,* of which the *Gulf Stream* is a part. The *Gulf Stream* increases the northward transportation of warmer water by about 50%. At colder latitudes, such as in north-west Europe, the ocean releases this heat into the atmosphere – especially in winter when the atmosphere is colder than the ocean - and ocean atmosphere temperature gradients increase. In this way, the *Gulf Stream* warms these Atlantic regions by as much as 5 degrees *Celsius*, specifically tempering average winter temperatures. Research shows that the *Global Ocean Conveyor* system has shut down several times, suggesting that it is the 'Achilles heel' of our climate system. What would happen if such a shutdown were to occur again, where average temperature in north-west Europe cooled by 5 degrees *Celsius*?

Moreover, this situation would likely persist for many years rather than simply occur for a brief period.

…..***Initial outcome produced by the Environmental WC:***
After 2019, the average winter temperature of north-west Europe cools by 5 degrees Celsius. Energy usage increases dramatically in this part of Europe to compensate for this. In addition, average rainfall across the whole of the costal North-Western Europe area increases substantially, causing a significantly increased risk of flooding in low lying areas and river basins as well as the permanent reclamation of numerous flood plains across the area. Increased rainfall sees rivers pump ever more fresh water into the Atlantic thus ensuring that water salination levels continue to decrease. This means that no return to the previous situation can be expected for the foreseeable future. How then does Europe cope with a significant increase in energy usage in the north-western areas while, in addition, dealing with the land use issues connected to flooding and increased environmental hazards?

…..Territorial Impacts:
A change in climate of this magnitude would have a significant impact in a number of areas, namely tourism and recreation, agriculture, heating and energy costs, retirement and relocation patterns and perhaps also on travel. It is hard to see where the impacts would however be positive. As such, this wild card looks at how, after 14 years of policy difference, Europe shapes up to this event under the difference policy mixes provided by the *competitiveness* and *cohesion* scenarios. Only the immediate area of the Atlantic coast of north-western Europe and its hinterland (a mix of rural and urban regions forming one corner of the Pentagon but with many outlying peripheral areas and a mix of agricultural areas) has been considered here. We assume that the wild card will be 'manageable' and, as such that habitation of the area remains possible, simply that the climate of the Atlantic coast becomes much more like that of the Scandinavia. It is then in the rural areas where the impacts are likely to be most pronounced.

Competitiveness Scenario
In this scenario the competitiveness policy 'endowment' has seen the rapid liberalisation and 'industrialisation' of agriculture in particular and rural life in general, with a distinct difference between well and poorly-performing rural regions emerging. Rural development has not been prioritised while the CAP and other capital transfers from the EU budget have either been abolished or declined significantly. The transport infrastructure in rural regions has not been prioritised while public spending and equalisation measures have declined over time. Europe as a whole has seen energy usage levels increase as more private motor vehicles are purchased as the standard of living increases in Eastern Europe, although in this north-west area of Europe energy usage has remained more or less constant. In terms of the environment and the issue of natural hazards/disasters in particular, adaptation measures have been undertaken only where cost-effective, while mitigation measures have generally been driven by technological developments in the private sector.

This however leaves the north-west Europe area in a difficult position after 2019. In the drive for competitiveness at the global level rural areas not able to fend for themselves have been left behind in many respects with the priority given to metropolitan areas. As such many areas of the rugged Atlantic coastline find themselves unable to cope with this significant development in respect of climate change with the fall in agricultural production and the rise in heating and transport costs all having a significantly negative impact. In terms of the areas preparedness for natural disasters this also proves to be insufficient. Areas such as river valleys and populated flood plains (particularly in the East of England) are significantly affected as the pressure for 'affordable housing' created by the booming economy of the south-east of England has seen much over-development of the housing

stock in eastern England and in northern France – without a proportionate investment in local services/facilities.

Cohesion Scenario
The cohesion policy 'endowment' has seen a much less fundamental change away from the baseline. The EU budget has been maintained with funds still being channelled to the weakest regions (although very little of this SF money will now find its way to north-western Europe) while only minor changes to the CAP have occurred and an active policy of rural diversification has been put in place. In transport terms priority support has been given to rural and less developed regions while in energy terms decentralised energy has been promoted. Perhaps most importantly however, strict mitigation measures have been put in place to deal with the effects of climate change while a large range of adaptation measures have also been set up, and paid for directly from the EU purse.

As such then, while the problems faced in terms of climate change remain the same in this scenario the ability to deal with them effectively is much increased in the cohesion scenario as the rural areas themselves are not in such a poor situation to begin with, while the safety net of public funds and adaptation measures mitigate, to some extent, the basic effects of the wild card. The fact that many of these rural areas are however still functioning economically at all in this scenario is perhaps what gives them the biggest advantage over the competitiveness scenario.

6.4 Theme: The European social model

…..Title: Without the net – The sad demise of Europe's social security systems

…..***Story Line:***
Economic growth has continued to slow across Europe, while ageing increases and job creation stagnates. In this context, as citizens blame 'globalisation' for society's ills, trade unions in the old Member States are successfully able to impose a high level of social security provision on all Member States with a view to the avoidance of competition through 'social dumping'. As the New Member States are not yet able to effectively contribute in financial terms to this new Europe-wide solidarity system, the fiscal burden falls predominantly on the Old Member States. This however results in increasing public debt in complete contradiction to the Maastricht criteria, leading to high inflation rates, more unemployment and an even deeper recession. Confronted by this vicious cycle, mixing the effects of weak demographic development, political manoeuvring, fiscal crisis and economic recession, by 2022, European leaders declare the European social model 'bankrupt', halting almost all social redistributions. Thereafter, it is up to each citizen to find a way to support themselves and their families.

…..***Initial outcome produced by the Social WC:***
After a period of 'living beyond its means' by 2022 the European economy faces massive turbulence and a significant period of restructuring once the end of the 'European Social Model' is effectively announced. Social transfers on the state-individual level the inter-regional level and the intra-state (EU) level are reduced to the bare minimum beyond invoking social unrest. Intra-state (EU) transfers are hardest hit suffering almost complete abolition as regional policy is effectively re-nationalised. Market-based logics replace traditional 'European' ideas of social cohesion and territorial equalisation. How then does Europe cope with this 'boom and bust' scenario in terms of social transfers?

…..Territorial Impacts:
A fundamental economic change in territorial cohesion policy across Europe would have a significant impact in a number of areas (this wild card deals primarily with transfers at the EU level as some minimum level of transfers is assumed to continue *within* states at the individual level). The primary areas of impact would be on East-West 'catch-up', territorial cohesion, and regional policy. The wild card itself represents a major and catastrophic impact particularly for the cohesion scenario the basis for which effectively collapses after 2022.

Competitiveness Scenario
In this scenario the competitiveness policy 'endowment' (pre-2022) of reduced public expenditures, more privatisation, increased labour market flexibility, CAP liberalisation, and reductions in rural support combined with a policy stand that favours concentration on the endogenous potentials of individual regions rather than specifically targeted support for failing regions, in effect, sees the logical conclusion of the policies adopted in the preceding period. The outcome of the wild card in this scenario would see the richest, most successful regions moving forward and benefiting from the advantages globalisation has to offer while the less successful regions would (initially at least) find it increasingly difficult to survive in the harsh economic climate that emerges. In specific terms, rural and peripheral regions in Central and Eastern Europe would suffer, as they fall ever further being the Pentagon, while areas with a declining industrial and manufacturing profile or those with only light industries of a low to medium technology level (most susceptible to out-sourcing/offshoring etc) in the EU15 as well as in the New Member States would also suffer. The transport and energy policies followed up to 2022 would simply magnify the effect produced by the wild card. As such then, disparities increase across the board and at all levels from the Europe-wide level down to the city level where winners and losers would be clearly differentiated. With the 'institutional glue' of the CAP and the Structural Funds removed and disparity levels increasing both within and between societies, regions and cities basic governance questions would be likely to emerge with a few favoured 'global' cities racing ahead and perhaps eventually challenging both the national and the supra-national levels for dominance.

Cohesion Scenario
The cohesion policy 'endowment' of a menu of traditional equalisation policies at both the national and the EU levels including the maintenance of the EU budget priorities, with the Structural Funds aimed at helping lagging regions, as well as a move towards EU-level tax harmonisation is fundamentally impacted by the demise of the entire philosophical edifice upon which this approach is based. Unlike the competitiveness scenario, this wild card sees the pre-2022 trend turned on its head, though the actual outcome of the wild card in terms of territorial impacts would likely be rather similar to that of the competitiveness scenario, with the only major variable being the impact that 17 years of 'cohesion' had had on the areas most likely to be affected. In this sense then the impact of the wild card would be somewhat reduced as significant investments in, for example, transport would have already been made in the rural and peripheral areas, while energy production would have advanced some way towards localisation and diversified rural development would have had a significant impact in (most probably) the rural areas of the EU 15 countries. It is however unlikely that the countries of Central and Eastern Europe would have 'caught up' by 2022 (perhaps with the exception of a few capital regions and high-tech enclaves), while the sudden withdrawal of the fiscal and institutional 'safety blanket' from many traditional lagging regions may actually see them suffer even more egregiously than would have been the case if a managed process had been enacted upon sooner.

As such then, the likely outcome of this wild card is the simple magnification of existing tendencies towards competitiveness, increasing disparities across the board and the abandonment of any notion of territorial cohesion. This would happen rather quickly in the competitiveness scenario and a little more slowly in the cohesive scenario, though the end

point would ultimately be the same. This would put significant pressure on both the state and the supra-state level with global city networks (of successful cities) potentially reaping the rewards, while rural and peripheral areas and unspecialised medium-sized cities being fundamentally impacted.

6.5 Theme: globalisation

…..Title: As the bubble bursts, the dollar goes down the drain

…..***Story Line:***
With USA(*inc*) still politically and militarily mired in a 'global' conflict with Islamic Fundamentalism across an 'arc of crisis' running from North Africa to Central Asia, pressure on the US economy grows as US indebtedness increases to unmanageable proportions, with the dollar in particular eventually bearing the brunt of the ongoing global realignment of economic and financial power which sees East Asian Central Banks finally shift from buying dollars to buying Euros. This process is reinforced by a reduction in the consumption power of US consumers whose real wages have declined significantly. The dollar loses its status as the reserve currency and the rest of the world invests in the Euro, which thus becomes the new *de facto* global reserve currency, by 2020.

…..***Initial outcome produced by the Economic WC:***
The European economy fulfils the four basic requirements enabling it to displace the dollar. The currency services a large economy that has open and deep financial markets, low inflation, and an economy where confidence in the value of the currency is strong. The impact of the *Euro* becoming the world's major reserve currency is substantial in global terms as foreign banks have to purchase large amounts of Euros to maintain their export competitiveness, thus increasing the value of, and the demand for, the Euro. Though 'dollar hegemony' is not simply substituted by a new 'Euro hegemony' the major impact of the Euro's new found position is that commodity trading – most importantly in oil – is now carried out in Euros rather than dollars, while reserve currency status effectively protects Europe from the detrimental effects of a negative trade balance. This reduces somewhat the real cost of energy for Europe while also boosting trade as transaction costs are reduced. The impact on the USA is however severe and industries that export to the USA will be impacted accordingly. How then do the scenarios cope with Europe's new found global position as fiscal giant? The major questions here relate to comparatively cheaper energy and better export opportunities.

…..Territorial Impacts:
The end of 'dollar hegemony' and the emergence of the Euro as the world's major reserve currency would have a fundamental impact on Europe's economic development. While it is highly unlikely that such a transition would be smooth however in the context of this wild card we have chosen not to concentrate on the detail of the transition period itself, preferring instead to assume that an orderly transition has occurred and that the global economy has readjusted to the shock – though the US economy would likely face a prolonged period of major restructuring and debt-reduction. How then would the two scenarios react to the Euro's new found status as global reserve currency?

Competitiveness Scenario
In this scenario the competitiveness policy 'endowment' pre-2020 has seen public spending and taxes reduced while labour markets have been deregulated and the EU budgetary priorities refocused towards R&D, education, and ICT. In territorial terms, the core areas have been advantaged over the peripheries and the Pentagon over small and medium-sized cities and rural areas. Europe's major metropolitan areas are geared up to fully exploit the potentials inherent in globalisation. In this context the major initial impacts of Europe's new

fiscal role would likely be that oil – as it would now be paid for in euros rather than dollars - would be relatively cheaper than was previously the case due to the saving in transaction costs and because foreign Central Banks would be forced to buy euros to protect their own currencies. In addition, a second benefit accruing to Europe would be the likely boost in terms of international trade. As Europe, unlike the USA, does not run a substantial deficit, interest rate and price stability advantages would also accrue to the Euro zone. Similarly, as foreign banks build up increasingly large euro reserves, more goods and services would be purchased from the euro zone.

This would see a major boost to Europe's economic position, and while the economic effects would accrue in the main to the globally competitive zones price stability and trade benefits would filter downwards. This would undoubtedly however simply reinforce the already existing trend in territorial development pre-dating 2020 with metropolitan areas advantaged until externalities such as environmental and/or housing costs intervened. It is unlikely moreover that the situation pertaining in peripheral rural areas would be reversed, though East-West 'catch-up' (at least in a select number of metropolitan areas in, or abutting, the extended Pentagon) would be accelerated.

Cohesion Scenario

In this scenario the cohesion policy 'endowment' pre-2020 saw a much less fundamental change away from the baseline (pre-2005) period. EU funds continue to be channelled to the weakest regions (now predominantly in the new Member States of East-Central Europe) while minimal changes to the CAP and major policies of rural diversification and the prioritisation, in construction terms, of rural area transport links at the expense of those between major metropolitan areas, see such areas decline in importance *vis-à-vis* their US and East Asian competitors. The European economy suffers less for the wide disparities of the competitiveness scenario but is, on the other hand, less able to quickly take advantage of the opportunities offered (to the most competitive regions) by globalisation.

Notwithstanding this however the benefits of the euro's new found position would likely still accrue in a similar manner in this scenario to that of the above. The benefits of cheaper oil would occur as before, though with better transport networks beyond the Pentagon and more manufacturing industry (as opposed to simply high-tech and services) still in existence, the immediate benefits from trade would likely accrue to a wider area. Medium-sized cities outside the Pentagon, for instance, would likely do better in this context than in the competitiveness scenario.

As this is such a positive outcome for the European-wide economy, in the short to medium term there would be few, if any, losers, with perhaps even agriculturally-based peripheral rural areas doing better in this scenario than in the competitiveness one. In the longer term however a Europe still wedded to a subsidy-based 'equalisation' culture and strict territorial cohesion could see costs rise appreciably while 'reserve currency status' may be jeopardised if price stability, interest rates and balance of payments issues are not constantly re-evaluated.

7. Europe 2030: Proactive, roll-back policy scenario / Spatial vision

7.1 Introduction

This proactive scenario has a special status within the project, as it is a "political" scenario, or even a political "vision". As such it is not the result of "pure" scientific work, but more an adaptation of the "results" of the other scenarios to the need for policy debate regarding future European territorial development. Today, this debate has found a leading principle in the notion of "territorial cohesion", a concept defined only vaguely but one which introduces the idea of thinking territorially about the state and evolution of Europe. It is this kind of thinking which should be the guiding thread throughout this scenario or vision.

This proactive scenario should be considered an imaginative "vision" combined with realistic policy goals. A "pure" vision might be too unrealistic and thus not very useful in the current policy making context. We, therefore, propose an open view indicating a direction in which the future might evolve and which is open for debate. It is not a closed and indisputable world view prescribing how the future must evolve. On the other hand, we did not want to stick to a pure "realistic" combination of cohesion and competitiveness, as a proactive scenario should have the character of a so-called *Leitbild* and so should go beyond the current ideas and possibilities. More practically, confining ourselves to a scenario simply comprising the competitive and cohesion policy combinations, would not respond to the major challenges European regions will face in the near future. We have thus decided to go for a form of proactive scenario which identifies the major contradictions between current policy options and general driving forces, and proposes a "vision" of how these contradictions might at least be alleviated.

Both the ESDP – at this stage still the main *territorial* policy document at European policy level – and the Lisbon/Gothenburg strategy – currently the main *general* policy document – have been built around the triangle of sustainability, although obviously with different emphases. This triangle, composed of economic, social and environmental sustainability has to be understood as trans-scale, i.e. of relevance at the macro-scale across the entire ESPON space, at the meso-scale of the trans-national cooperation areas and at the micro-scale of individual countries and regions. The aim of this proactive scenario is to present a harmonious combination of these three goals, including compromises where they are contradictory. Obviously, this might not be the only possible combination. However, the main aim of this document is not to show *the* one and only way, but to raise the issues and to provoke the debate on how Europe wants to evolve territorially in the future.

From the existing documents, one can identify several main goals of territorial development:

- spatial balance (if not equity)
- accessibility
- access to services
- global competitiveness
- regional competitiveness
- protection of environmental resources
- protection of cultural resources

Combining them with more general (non-territorial) goals, the team, in close collaboration with the ESPON Monitoring Committee, has come up with the following list of major long-term policy objectives that should constitute the basis of this proactive scenario:

- Prosperous, competitive and diversified economies
- Innovative knowledge society
- Sustainable transport
- Balanced distribution of population, wealth, cities, etc
- Socially inclusive society and space
- Sustainable settlement structure
- Sustainable use of energy
- Healthy environment and hazard prevention
- Diversified cultural heritage and identities
- Territorially oriented governance

A major lesson learned from the baseline scenario and the two prospective roll-forward scenarios is that **the objectives addressed by current policies** (mainly competitiveness, cohesion and environmental protection) **might not be the most urgent, or at least not the only ones determinant for the future spatial configurations of Europe**, if the above goals are to be reached. Indeed, the following main challenges were identified:

1. demographic challenge: ageing, a declining labour force and immigration
2. accelerating globalisation, knowledge economy, metropolitanisation and delocalisation
3. a new energy paradigm: higher energy costs
4. accelerating climate change

Of these, only globalisation (partly), and now increasingly climate change, are addressed in the main spatial policy debates and documents. Nevertheless, the others will have a fundamental impact on Europe's regions and will, therefore, need to be addressed. However, all these challenges cannot be influenced very much by policy, and certainly not by territorial policy, at least not in terms of the fundamental driving forces. Therefore, policy has to be conceived within the given context of these challenges and has to deal with their impacts. To achieve this, it has to find innovative means. In this proactive scenario we, therefore, concentrate on those elements which are relevant to (territorial) policy making, embedding them in the general evolutions foreseen in our baseline scenario.

7.2 Territorial image of Europe by 2030

As opposed to the prospective scenarios elaborated in the previous sections which **result** in a territorial image, the rollback scenario **starts** with a territorial image. This is based on the above-mentioned objectives as well as on the lessons learnt from the other scenarios. The way this image is elaborated differs significantly from the approach adopted in the prospective scenarios. It does not rely on modelisation and projections and it is much more intuitive and teleological by nature. It is more a vision than the result of a complex iterative process. For that reason, the degree of territorial detail is less developed than in the other scenarios. The basic challenge in elaborating the territorial image of a rollback scenario is to keep the balance between wishful thinking and realistic possibilities. Following the usual ESPON typology, the scenario is presented according to the three territorial scales: macro, meso and micro levels, as a scenario story told from the perspective of someone in 2030.

Macro-level

By 2030, the European population is, on average, older than in 2005, with strong variations, however, from region to region. The total population has stabilised through higher levels of immigration and, albeit slowly, through higher fertility rates. Areas with a particularly old population (average age above 50 years) are eastern Germany, northern Italy and Sardinia, Corsica, north-west Spain, Scotland, northern Sweden and central Greece. These 'old" regions have gone through some fundamental structural changes which have led to lower population densities and a reorientation towards residential economies. The medium age of the population is generally lower in urban and metropolitan regions than in rural areas. There are however exceptions, as in the case of attractive rural regions in coastal or piedmont areas where companies in the knowledge-based economy have attracted young qualified manpower.

The European territory is shaped by 2030 by a very different economy than that which prevailed in the early 2000s. Knowledge-based and highly innovative activities have generalized at the expense of manufacturing activities relying on outdated technologies and low-cost manpower, of low-level service activities in the financial and insurance sectors and of highly subsidized agricultural activities. In a context of increasing global interactions, the only way to maintain jobs and to generate sufficient added value has been to invest in productivity increase, i.e. in technologies and in the qualification of human resources.

In addition to the European majors which are more numerous than in the early 2000s as a result of a less fragmented European economy, a large number of service and technology enterprises are competing on world markets in the form of small, highly flexible units, collaborating, also at transnational level, on project-based activities. Their location is more widespread than in the case of very large units, but accessibility and the proximity of knowledge have remained important prerequisites.

Although the external competition of emerging economies takes place, by 2030, increasingly through innovation, know-how and technologies, the European economy has reached a sufficient level of competitiveness to increase its share in the strongly growing external markets. A great number of sectors reached by 2030 a leading position in terms of technology and productivity. The achievements of an improved productivity and competitiveness have allowed a cohesion policy to be put into practice, which itself is backing the competitiveness-oriented policy strategy. Prosperity and growth are not limited to the large metropolitan areas of European and global importance. Instead, a greater number of urban areas of national or of sub-national importance, benefitting from the improved global position, make an active contribution in their own right to further strengthen Europe's global competitiveness. In addition to the concentration of metropolitan areas in the pentagon, other clusters of metropolitan areas have consolidated in various parts of Europe.

Some areas, however, have become less populated and have either gained more natural land cover, or have provided spaces for more autonomous living situations with small-scale subsistence and experience farming, including a high-level of energy-autonomy. These areas have lower growth rates than others, but their local populations accept this in exchange for less stressful lifestyles.

Other areas which were confronted with particular challenges at the beginning of the 21st century, have gone through differential developments. Many of the old industrial areas now have lower populations, some have succeeded in upgrading their industrial heritage into modern high-tech, capital-intensive industries. Others have strongly diversified their economies, connecting to close-by metropolitan areas. Some have slowed down and

become residential economies with commuting facilities to other areas. Numerous old industrial sites were sanitized and reconverted to other uses.

During the three decades following the year 2000, European rural areas were subject to strong dynamics. The diversification process already initiated in the 1990s in Western Europe continued and was also extended to Central and Eastern Europe. The new member countries benefited from CAP support, the CAP itself being subject to various reforms, including the implementation of WTO decisions. The strong development of the production of biomass and energy crops gave a new impetus to rural areas, including less fertile ones. Finally, the acceleration of climate change proved to be rather detrimental to rural areas in the southern half of Europe, while rather advantageous to those in the northern half.

Climate change has had important impacts on the European territory. The damages caused by natural hazards have been contained through systematic prevention and mitigation policies. This does not exclude, however, that particularly violent hazards periodically hit specific areas. The structural impacts of climate change on the territory resulting from drought and increasing average temperatures, are more important in southern Europe and in mountain areas where adaptation strategies have proven necessary in economic bases and production structures, in energy and water supply systems and in settlements.

Europe is covered by an extensive network of high-speed public transport infrastructures, and local public transport both in metropolitan and in rural areas (sometimes in very flexible and innovative forms combining personal and collective transport). Many individual trips are taken by public transport, due also to the fact that the combination of energy prices and pricing/taxation systems creates prohibitive barriers to "unnecessary" individual trips by car.

Even though the transport system is dominated by the main links between metropolitan areas, strong secondary networks link the intermediate spaces. Frequent inter-modal links for freight have been developed. Inland waterways play a particular role here, too. Important maritime links exist for freight, with railway connecting the ports to the hinterland. Cost (engendered partly by road pricing) has made long-haul road transport quite prohibitive, and so most trucks are used for local distribution. Throughout the transport network, national boundaries are virtually non-existent as transport technologies are harmonized and border controls abandoned.

The share of renewable energy sources in total energy consumption has significantly increased, which means that a larger part of the European territory is devoted to this type of activities (biomass production, wind energy etc.). Much of this production is decentralised to individual homes (wood, solar and wind) or small settlement areas (geo-thermal, biomass, etc with local cogeneration), although some large-scale installations also exist (wind farms, tidal energy, etc). A significant part of mass energy production still originates from large-scale plants, but new technologies have emerged, especially hydrogen production and related applications, liquefaction and gasification of coal etc. These have limited the expansion of nuclear energy.

By 2030, the European territory is still imbalanced, but less than it was in the early 2000s. The catching up of the countries of central and eastern Europe has progressed, especially through the consolidation of networks of metropolitan areas and medium-sized cities.

The effects of different enlargement hypotheses

It is impossible to define an "ideal" level of enlargement and our image therefore does not contain much reference to this question. Enlargement does, however, raise a series of issues which can influence the scope of policy choices. Some of these are:

- **Cost**: As most potential enlargements (with the exception of a very hypothetical entry of Switzerland or Norway) concern countries with a GDP/cap level far below the European average, cohesion and structural funds will be diverted to these regions which will have great needs in terms of infrastructure investments. So, a political arbitration will have to reflect how the budgetary constraints resulting from enlargement will impact on the policies proposed here.
- **Demography, migration and labour markets**: Turkey, but also some of the Southern Mediterranean states, presents a very young population and thus a potentially high input into the European labour force. If neighbourhood policies support large-scale education programmes, this population could be ready to enter the European job market at the moment of enlargement. However, this probably requires that a series of conditions are met:
  • All countries have to accept these new migrants in order to avoid their concentration in only a few countries (as was the case in the UK after the 2004 enlargement, leading to a more restrictive policy for 2007)
  • Integration policies have to be in place concerning education, housing, social services etc.
  • As most of these young countries are dominantly Muslim, Europe has to come to grips with the issue of cultural and religious diversity.
- **Markets**: with an ageing and possibly shrinking population, integrating new countries could obviously compensate by opening new markets. At the same time, free trade agreements already exist, so the real extent of these new markets is not as clear.
- **Neighbourhood policy**: Any enlargement obviously also has to be seen from the perspective of those who do not enter. The choice for or against enlargement is thus conditioned by the quality of possible compensatory neighbourhood programmes, if only for the question of security: Europe will never be able to shut itself off from its surroundings and a proactive policy seems more efficient in this case than a defensive one.
- **Exporting the European model**: Currently other forces (notably the US) have significant influence in the potential accession countries. Integrating them into the Union would allow to expand the zone of influence of the European societal model, something which might become necessary if Europe wants to preserve this model.

Meso level

Better balance between the various European macro-regions has been reached through reinforced territorial cooperation in networks and clusters of metropolitan areas. The highest level of integration by 2030 is to be found in the network of metropolitan areas of the Baltic Sea Region, where Sankt Petersburg has gained a significant position, competing with that of Berlin. The new "Eastern Square" of Central and Eastern Europe, formed by Vienna, Berlin, Warsaw and Budapest - including Cracow, Wroclaw, Leipzig, Dresden, Prague and Bratislava has emerged as a powerful network of cities attracting significant investments. In south-eastern Europe, the prosperity of Istanbul has generated the emergence of a cluster

involving also Athens, Bucharest and Sofia. In the western Mediterranean, the cluster of the Latin Arch comprising Genoa, Nice, Marseille, Montpellier, Barcelona and Valencia has consolidated to become a lively coastal region with high-level technological, cultural, service and transport activities. In south-west Europe, the integration of the cluster Madrid-Seville-Lisbon-Porto has been facilitated by the development of an efficient HST network and has benefited from the increasing economic interactions with the countries of Latin America. The cluster of metropolitan areas of the economic heart of Europe (the "pentagon") has expanded towards the north-west to include the Midlands, Dublin and Belfast, towards the east along the Munich-Salzburg-Vienna corridor, joining the new cluster of central and eastern Europe, towards the north-east, joining the Baltic metropolitan cluster and towards the south, joining the Latin Arch.

By 2030, rural areas and landscapes in Europe are much more diversified than they were in the early 2000s. Some have substantial population density in relation with their proximity to large towns and metropolitan areas and to their attractiveness for residential and tourist functions. These are spread throughout east and west in the surroundings of large cities, in coastal areas, in attractive valleys of mountain regions and in a number of Mediterranean and Black Sea regions with favourable climates. The degree of economic diversification of these rural areas is rather high and in many rural areas landscapes are improved because of a substantial increase of investments by the Rural Development Policy. Some rural areas are the location of intensive industrial agriculture or large-scale wind energy production. Many produce the "modern" forms of energy such as wood and crops for bio-fuels. Some are used as biodiversity reserves and areas for soft tourism, with only very few people actually living in them.

The CAP has been profoundly reformed and expenditure reduced to free monies for other tasks such as public transport and education. Most of the large fertile areas and those close to the main consumption centres (agglomerations, tourist areas) are competitive and sell their products on the global market without any price support and in spite of strict regulations regarding animal health, animal welfare, and environmental protection. These regulations have forced the industry to develop new techniques, thus making Europe the world leader in industrial-scale "green" agriculture. Many of the Eastern European rural areas have managed to go along this path.

In southern Europe, numerous changes have taken place in agricultural production, energy systems, water management systems and tourist development, in order to face the impacts of increasing drought. Water-demanding types of cultivations (like maize, vegetables etc.) were progressively replaced by water-saving ones (such as sunflowers, colza), used among others as energy crops. Forest management has also been adapted in order to limit the impacts of fires. Electricity from hydro-power has partly been replaced by electricity from solar and wind origin. The development of new, large-scale tourist resorts was avoided. Instead, small-scale, more sustainable projects, better adapted to local natural, climatic and hydro-geological conditions were developed.

Mountain areas are very busy adapting to the impacts of climate change, such as reduced snow fall and increased risks of land slides. Skiing has become a luxury activity in the Alps and the Pyrenees mostly limited to glaciers. Most of the tourist areas in the mountain regions have developed alternative tourist attractions, but they have mostly diversified their economies in order to tap other revenues. Some have returned to a more natural state with a combination of small-scale agriculture, nature tourism and commuting to larger centres.

The densification process of coastal areas has continued in most parts of Europe, but new settlements were grouped around existing towns and nuclei, so that further sprawl could be avoided and natural areas were efficiently protected. A number of sandy coasts became

however affected by the increase of the sea level and protection measures had to be implemented to protect settlements.

Micro level

By 2030, most cities have developed new forms of sustainable development and solved a number of problems which were existing or emerging in the early 2000s.

Within cities social segregation continues to exist, but the increase in social and other forms of low-cost housing, as well as targeted public intervention in land and housing markets alleviated the pressure on the poorest households. These developments are increasingly integrated into the existing urban fabric creating a stronger social mix. This also allows a reduction of the centrifugal pressures leading to urban sprawl, as households are no longer obliged to move as far outside of the city to find affordable housing, thus facilitating the provision of services to the population and reducing the energy bill. Encouraged by the high costs of individual transportation and by active, binding planning measures, densification and new urban developments take place in connection with public transport networks. Home working has significantly progressed, so that numerous active people do not need daily commuting into the cities and prefer residential locations in surrounding rural areas, in particular those well connected by public transport.

Important investments in education, allowing for example a reduction of the number of students per class and more targeted language education, as well as proactive employment policies, including public employment in personal services, have allowed a better integration of immigrants and other marginalised groups, thus reducing the tendency to urban ghettoisation. This is reinforced by the diversified and more integrated localisation of low-cost housing. Immigrant areas are, despite this, still present and are encouraged to serve as entry points and springboards for newly arrived immigrants.

The environmental quality of urban areas has progressed as far as air quality and noise levels are concerned, mainly through the reinforcement of public transport systems, the limitation of individual transport in city centres and the wide adoption of new car engines (hybrid cars and fuel cell engines). Measures have also been taken to limit energy consumption and to take advantage, as far as possible, of renewable energy sources. Urban functions became better integrated in order to reduce transport flows. Buildings were more efficiently insulated and adapted to energy conservation. Solar and wind energy production have also expanded in cities thanks to new environmentally-friendly technologies.

Important changes have also taken place in urban-rural relationships. The wider hinterland of the large metropoles not only gains benefits as a location for short distance re-creation, for housing and for settling down of retirees, but for economic activity, too. For example, the steep increase of energy prices has lead to a considerable re-thinking regarding the location of production in the food sector. While at the beginning of the 21st century milk, yogurt, fruits and vegetables were delivered over hundreds of kilometres across the country, in the intervening period a significant re-distribution of production units in the food sector took place. Intensive cattle farming and horticulture concentrated in sustainable agro-production parks near large urban agglomerations. Firms which were close to the food production section, e.g. laboratories conducting quality control and food security, and producers of packaging means, followed this trend. The demand for organic food has given an additional impetus for the emergence of agricultural and food production close to the large urban metropolises. Large-scale recreation and leisure areas were developed at proximity of large cities, well connected through public transport. Such strategies have been helpful in containing urban sprawl and suburbanization, first in reducing the demand for new Greenfield settlements and, second, in better controlling land-use changes.

In rural areas, more distant from metropolitan regions, medium-sized cities are playing an important part in delivering functions, especially services and employment, which make possible to maintain regional stability, to counteract out-migration and to enhance and exploit the development potentialities of rural areas. By 2030, however, remote, peripheral areas which do not possess large urban centres or dynamic medium-sized cities continue to show signs of economic backwardness. In these areas "intelligent shrinking" took place. Due to an – unavoidable – decline of population, the regions which faced this challenge started a re-organisation of their spatial structure. To avoid economic losses, the provision of services of general interest (education, healthcare, libraries) is concentrated in medium-sized or small cities or provided in mobile form (mobile health centres, libraries, etc). Investment in public transport allows citizens in less-densely populated areas to access services concentrated in the local urban cores.

Description of the map for the roll-back scenario

The map illustrates the emergence of **economic integration areas** outside the pentagon, based on **major urban networks**. Within these major networks **regional and local networks** interlink neighbouring cities and towns. The various economic integration areas are interconnected by **major communication links**. A number of metropolitan areas act as linking cities along these communication links. Outside metropolitan regions, a number of **rural areas** fulfil significant new functions, as for example for the **production of biomass** or the development of a **dynamic residential economy.** The map also illustrates the need to promote **maritime freight routes** in order to increase the sustainability of transport.

Commentary for the MC:

We deliberately decided to make this map very simple and to only show some of the many elements contained in the roll-back scenario. This has several reasons:

- Readability: the other scenario maps are quite complex to read, which is justifiable because of their more "scientific" character. As the roll-back map is even more of a communication device, it should be very simple and focus on some major new elements.
- Such a roll-back scenario obviously has some level of arbitrary to it. Detailing the map too much would lead to a focus on these details and would make people react negatively if they don't recognize their reality in these details. Keeping it more schematic and simple avoids such possible reactions.
- The normative character of the map: Contrary to the other maps, this map has a more normative character to it. In other words it shows a possible vision of how Europe **should** look like in 2030. Again, as experience shows this is a great source of conflict and we hope that through keeping it simple we will limit this conflict.
- Keeping the focus on the more useful parts of the project: In our eyes, the prospective scenarios, and especially the baseline scenario, are the more useful and important results of the project. They are the ones that help shape the debate on the actual challenges ahead. We would not want to have the readers of our reports leave these parts unnoticed because they focus too much on the roll-back.

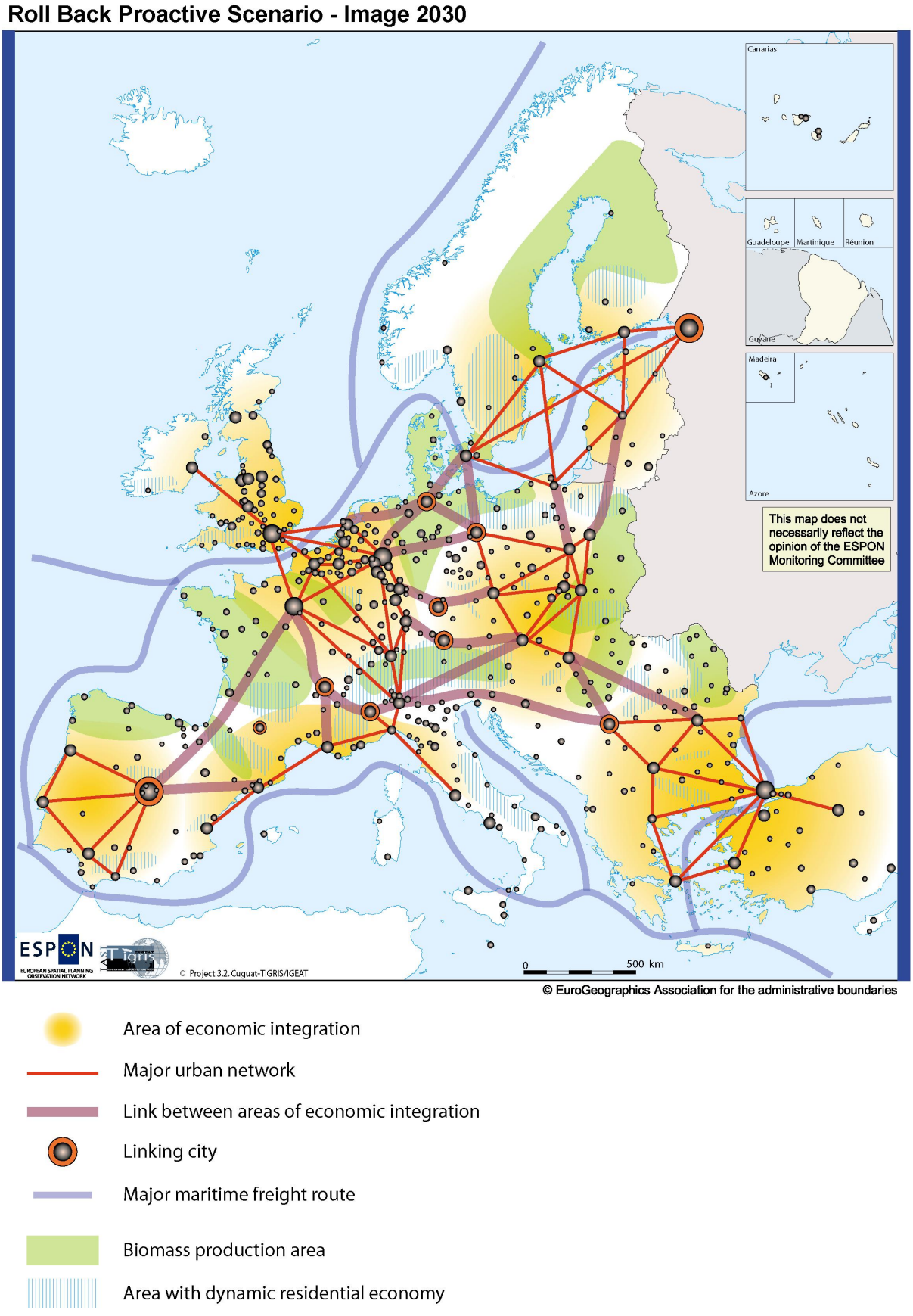


Figure 38 Roll-back proactive scenario – image 2030

7.3 The path

After the rejection of the constitutional treaty, difficult negotiations regarding the EU budget for the period 2007-2013 and the realisation that the current policy approaches were too half-hearted and clearly ineffective, it was decided that a new course of action was needed. An open and participatory debate was thus instigated within Europe about the future direction that the EU and its member states should take in terms of its fundamental policy goals. Forums were organised, enquiries made, and discussions held throughout the media.

It was surprisingly easy to establish a list of priorities reflecting as best as possible the aspirations of European citizens, most of which had already been part of the array of existing policy documents:

- *To safeguard the general standard of living, including access to all necessary services from anywhere in the territory*
- *To protect health and personal safety, including protection from environmental hazards and pollution*
- *To enable the opportunity to contribute usefully to society, be it through paid work or other forms of activity*

The main difficulty was not in defining the objectives, but rather the means to achieving them. The debate raged between, on one side, the defenders of a competitiveness-oriented approach and on the other, the supporters of the cohesion-oriented approach. The former contended that only if the European economy remained competitive in global markets would we be able to sustain the levels of wealth and quality of life we desire and that such competitiveness could only be reached by concentrating efforts on the champions and letting market forces play. On the other side, it was argued that what was most important was not Europe's level of competitiveness on the global scale, but rather a socially and territorially balanced distribution of the fruits of productivity growth, requiring active state intervention. It became clear that an approach had to be found combining the best elements of each in a complementary and synthetic way.

The first entry point was the realisation that in both cases there was a need to sustainably increase productivity, and that two interlinked elements seemed indispensable for such a rise in productivity: education and innovation. It was, therefore, decided that these two factors should be the main objectives of the new central European policy. And that this would have to be clearly echoed within the member states in terms of national policies. The Lisbon strategy had already highlighted these objectives, but was only moderately successful in implementing them.

In terms of governance, the experience of the Lisbon and Gothenburg strategy had shown the limits of the open method of coordination as policy instruments, resulting in insufficient efforts of many member states. At the same time, it was recognized that the strict application of the Maastricht criteria also made proactive policy making more difficult in some cases. It was, therefore, proposed to embed the new policy goals into a system of extended criteria, fully integrating the Maastricht criteria, but also including others, such as the percentage of GDP spent on education, percentage of GDP spent on R&D and availability and easy accessibility of services such as child and health care, education, etc. This approach was first tabled by the new French government at the Lille summit in 2008 and after several years of discussions finally led to the Siofok treaty in June 2011 which set compulsory levels for each of these elements, with a certain amount of flexibility according to the current state of development of each member state and allowing a certain balance between the goals, i.e. a country is allowed a temporary budget deficit if this is justified by important investments for reaching one of the goals, or a country is allowed to stay under

par for a series of indicators if it is actively reducing its deficit and debt. In order to allow for regional specificities, the criteria were also nuanced and prioritised according to regional realities, leaving a certain degree of autonomy to each region on how to reach the goals.

Productivity then grew significantly. These gains in productivity were shared between profits, salaries and taxes in such a way as to allow continued investment into research and innovation. Overall growth was supported by internal consumption and not only by exports, with solid social coverage compensating for the pitfalls created by the high flexibility of the economy. The increasing participation of employees in the equity of enterprises produced interesting results with significant territorial impacts. Less European enterprises were taken over by non-European companies, so that more high-level functions such as management, R&D, marketing, design etc. could remain in Europe. In addition, the purchase power of those employees who are also shareholders increased, also generating more wealth, benefitting directly or indirectly through consumption, building activities, tourism etc. to a number of European regions and not exclusively to the most prosperous ones.

In a compromise between the competitiveness and the cohesion approach, it was decided to strengthen the productive capacities of all regions, but as it was just not possible to reach an equal level everywhere, it was accepted that economic activities concentrate in more productive regions, thus supporting agglomeration effects and face-to-face contacts, while other regions could benefit from higher levels of public support, if they contributed in one way or another to the European priorities, even those contributions were not "competitive". Examples could be the creation of biodiversity reserves or the maintenance of certain forms of landscapes. This was also linked to the realisation that such redistribution could contribute to the maintenance of a constant level of purchasing power and thus of internal consumption.

The idea of having a geographically differentiated approach to policy obviously requires that there be some territorial thinking at all policy levels, evaluating the role of each region and the impact of policies on each of these regions. It was, thus decided to integrated ex-ante territorial impact analysis into all policy making processes. This differentiated approach has also led to the acceptance of the idea that as each region has its own realities and its own function and, therefore, has to be able to determine itself its future development. Therefore much of the policy applied to each region had to be tailor-made in a bottom-up process, requiring a territorial governance approach which interlinks and coordinates all policies affecting a particular region.

The new policies obviously meant a serious reshuffling of budget priorities, with a reduction of classical budget lines such as the CAP and many other subsidy-based policies, especially within member states. In many countries it also meant raising taxes, in the line with the "Scandinavian model", so highly praised at the beginning of the century. At the same time regions also gained more fiscal autonomy being able to levy their own taxes and thus influence their public income. But reaching these goals did not necessarily mean a total dependence on public spending as private initiatives were also accounted for.

From 2012 onwards, levels of education and R&D spending rose rapidly in many countries, with a higher proportion of the population going through tertiary education and more European research centres reaching the highest global standards and attracting researchers from elsewhere in the world. European R&D policy focused on several lines of research in which Europe could find the highest added value for itself and occupy niche positions in world markets: environmental technologies in fields such as energy efficiency, new energy sources and vectors, water efficiency and green agriculture; transport technologies, including transport management; IT technologies facilitating home working, teleconferencing, distance learning, decentralised service provisions; decentralised fabrication and biotechnologies. The relevant budgets were targeted towards centres of

excellence, and thus often flowed towards more central, already advanced areas. Individual regions developed complementary innovation policies in order to profit of the centralised impulses and enhance their own territorial capital.

It became apparent however that education and innovation were necessary, but not sufficient conditions for higher productivity and GDP growth. European enterprise evolutions still showed high levels of inertia. In order to encourage a more dynamic firm demography, measures were taken to harmonise and ease the process of enterprise creation across Europe as well as the access to all forms of capital, the absence of which was found to be a major constraint in Europe compared to the United States, much more than an inflexible labour market. Moreover, market conditions were improved by splitting-up cartels and firms with an oligopolistic position.

The ageing of the European population which had already been recognized as a challenge in late 2006 was not such a strain on social security systems as expected since the higher dependency ratio has been partly compensated for by higher productivity. However, the need for more child friendly policies, already highlighted by the Commission at the time, continued to be felt notably because of shortages on labour markets. This was, therefore, integrated into the Siofok criteria. But since family-friendly policies are very long-term policies short-term solutions were also envisaged to support European labour markets. The increasing difficulty faced by European companies in finding sufficient labour led to more intensive programmes in support of internal labour mobility, as well as a revision of a common immigration policy towards an active quota-based system, which created a constant influx of fairly educated migrants, reducing, but not stopping, unofficial immigration. Special education systems were developed for these newcomers, aimed at integrating them as quickly as possible into the local working environment and reducing as quickly as possible any productivity gaps they might show.

In order to allow geographically differentiated approaches, the beginning of the new financial period of 2014-2020 was taken as an opportunity to reform the different instruments of intervention. To complement existing instruments that covered the entire territory (as with the Interreg initiatives) new differentiated instruments of intervention designed more functional types of territory were developed. Thus, programmes were introduced for potential global integration zones, for de-industrialising regions, for functional urban areas around metropolitan regions, for shrinking regions, etc. The content of these programmes were elaborated in a bottom-up approach, allowing each region to define its own priorities.

The programmes for global integration zones supported specific integrated economic developments based on targeted technological fields, thus aiming at creating a series of specialised (though not mono-cultured) high-tech conception and production regions which integrated industries, education, infrastructures and policy making into a common vision for the development of that region.

Many regions which had based their economies on labour-intensive sectors were clearly being undercut by low labour-cost economies and were rapidly de-industrialising. These regions additionally suffered from the decision to reduce subsidy-based policies which had supported these industries for quite some time. New investments generally concerned capital-intensive industries with low labour impact, and so solutions had to be found. In those regions where a lot of technical know-how remained, attempts were made to build educational and R&D clusters around the respective industrial heritage.

For those regions not too far from a metropolitan area, or within the range of a global integration zone, attempts were made to integrate them into the functional areas of the more dynamic cores, by increasing commuting speed and by positioning them as attractive

residential areas, with old industrialised sites sanitized and reused as loft housing or cultural centres.

Several regions suffered from a combination of significant out-migration and low fertility rates, leading to depopulation. For several regions, this movement seemed quite inevitable, and, therefore, mechanisms of "intelligent shrinking" had to be found. This concerned issues such as housing, infrastructures and flexible service provision. Special programmes for such shrinking regions encouraged the development of mobile services (health care, administration, etc), special transport systems combining individual and collective forms of transport in order to create links to the nearest urban area and also technical issues such as waste water management. At the same time the use of land for energy crops and wind farms was encouraged, thus making many of these regions energy exporters. In other regions, it was decided to allow nature to reassert itself, sometimes accompanied by reforestation, the products of which were also sold as sources of energy.

2012 will always be remembered as the year of climate catastrophe, a major turning point. In spring and autumn severe storms hit many different areas in Europe, with serious loss of life.. During the summer a continual heat wave lasting over two months destroyed many agricultural crops and ozone levels reached peaks never seen before. Forest fires erupted across the Mediterranean countries, and even broke out in the large Nordic forests.
Oil prices reached 250$ a barrel in 2013 with trends set to rise. When Russia bowed to Chinese pressures (and higher bids) and diverted a large share of its gas production to China in 2014, the energy situation became critical for Europe.

In the light of this combination of environmental catastrophe and energy crisis, it was decided to integrate a series of environmental and energy norms into the policy objectives. The Valetta treaty of 2017 introduced new criteria such as the percentage of renewables in energy use, the percentage of collective versus private vehicle usage, and the percentage of buildings complying with insulation standards.

An important part of R&D also went into research into energy production and consumption. The declared aim of the European energy policy was to make all European regions as independent of oil and gas as possible, replacing these sources with renewables, but leaving to each region the choice of the most adequate mix. The general idea was to achieve this with local resources, i.e. reaching a certain amount of energy autonomy at the regional level, although not all regions had the resources to do so (most notably large metropolitan areas). Sometimes economies of scale made large and centralised energy infrastructure projects more interesting, as for example large wind or tide farms and sustainable ways of using coal (gasification, liquefaction). Important investments were also made in terms of energy efficiency and isolation of buildings. Public intervention in this domain was often limited to public guarantees to the bank loans which the owners could easily pay back with the cost savings.

A lot of remote and depopulating areas became part of the energy autonomy drive by launching vast reforestation programmes for the provision of wood as energy sources or large-scale agricultural production of bio-fuels. New technologies for efficient and pollution-free burning of the wood and crops were encouraged.

Quite radical measures were taken concerning environmental protection, with air pollution standards by 2015 at levels higher than the Californian ones and a fast reduction of internal CO_2 quotas set by the Commission. Road pricing was used to curb traffic compensated by investments into more efficient public transport systems. However, these measures did not prove sufficient, and so in order to encourage a more local consciousness, it was decided in 2020 to introduce regional CO_2 quotas which the regions could freely trade. This encouraged regions to invest into local renewable energies and to further extend their public transport

systems. Some however decided to prioritise their economic development, even if this meant that they had to buy emission permits from other regions or companies.
These climatic events also helped spark an even greater effort for adaptation, reinforcing those already launched within the structural funds period of 2007-2013. These concerned measures for the prevention of droughts, forest fires and floods and, in addition, attempts at economic restructuring of those (mostly tourist) areas highly dependent on the weather, such as mountains and coasts.
In the former, it was realised that skiing would soon become a luxury and the economy in general, and the tourist industry in particular had to reorganise and diversify. Some profited from the increased demand for organic foods. Others, especially those with high accessibility positioned themselves as residential economies for home workers and retired, but tourism still remained a main source of added value in these areas.
Similarly in coastal areas, especially in Southern Europe, strong measures of water management and rationing had to be taken and strict planning of land development imposed, in order to slow down the building frenzy of the beginning of the century.
These environmental criteria also led to the need for an important reorganisation of transport. In many central urban areas where the level of car use reached unbearable levels leading to negative agglomeration effects, regional authorities took short-term measures, such as the limitation of private vehicle access to cities, inner city access pricing and higher-frequency collective transport systems. For longer-distance transport, road pricing (differentiated according to products with perishable goods taxed more lightly) accompanied by increases in energy taxes aimed at reducing road usage, while a parallel reorganisation of the European rail network was started, with the aim to separate as much as possible passengers from freight routes, so as to increase the commercial speed of rail freight transport. New transport management technologies were developed in order to further increase efficiency. Some investments were made to improve inland waterways, but the price tag on such investments limited their scope. However, new technologies in freight ships allowed an increased traffic, including container traffic on these inland waterways.

In zones close to metropolitan areas, two main forces determined the spatial structures: an increase in commuting and the revival of local food production. These two forces sometimes conflicted, with the residential function generally winning. Several regions, therefore, decided to take action to protect the agricultural function of parts of the land in certain areas. Some also explicitly stimulated organic agriculture and food-processing industries, as well as the creation of local distribution circuits in order to develop sort-distance supplies.

With energy and road prices rising, the organisation of residential commuter-based economies was only possible in conjunction with the development of collective transport systems. Through integrated planning covering the entire functional area of cities, such residential areas were essentially located close the nodes of these systems. Such planning obviously implied new and innovative forms of regional governance.

The trends towards metropolitanisation of the economy combined with the general increase in popularity of urban lifestyles contributed to serious problems with housing availability for the poorer socio-economic groups in many of Europe's metropolitan areas. Many households were obliged to pay an important part of their income for housing which decreased their purchasing power and thus also curtailed economic growth. In order to reverse this situation, countries and regions either invested in social housing or similar schemes or decided to directly intervene in land and housing markets which had the beneficial side-effect of giving policy makers more control over urban development. An important element in these policies was also to ensure a social mix within cities, by spreading low-cost housing developments across the entire territory of the agglomerations. This also fostered the socio-cultural integration of the tenants of these estates.

The severe gradient of wealth between Europe and its neighbours presented significant security issues on the one hand, but also an important potential in terms of a large pool of young population, on the other. In response, Europe decided to seriously reinforce its neighbourhood policy in the form of massive education and infrastructure programmes in countries bordering the Continent, especially on the other side of the Mediterranean, where the potential of a young potentially active population, was particularly strong.

7.4 Issues and contradictions

The above image of Europe in 2030 and the path to reach it contain some important issues for today's policy debates and also highlights some contradictions implicit within them.

- Spatial policy in the current context is confronted with a fundamental contradiction in its policy aims, especially when the latter are embedded in over-arching (non-spatial) policy goals: current economic development in Europe is more and more based on agglomeration economies, leading to concentration of activities in certain areas, in a highly path-dependent process. It is such agglomeration economies that allow certain areas to present successful economic profiles in a global context, thus generating the so-called "global competitiveness" of Europe. This tendency obviously leads to concentrations of economic activities and production of wealth which are contradictory to the aims of European **spatial** policy, i.e. a more or less homogeneous standard of living, including access to services and to jobs, across all European regions. Several options seem to emerge from this contradiction:

  - accept the concentration for the sake of the greater good (as currently perceived), i.e. the economic growth and global positioning of Europe, and "abandon" certain areas allowing them to return to natural states, or at least to remain on fairly low economic and social levels;

  - distribute (parts of) the wealth gained in the concentration areas to all regions in order to ensure comparable levels of regional income

  - develop mechanisms which will lead to a more automatic (non state-imposed) diffusion of the wealth generated in the concentration areas through market forces. At this point, however, it is not clear what these mechanisms might be, other than commuting and the recreational economy.

  The image tries, as much as possible, to combine both the second and the third solutions.

- One of the major ambitions of spatial planning in Europe has always been the reduction of polluting transport, either by shifting transport needs to less-polluting modes, or by reducing transport all together. The former has proved very difficult unless fairly radical measures are taken (e.g. inner-city toll in London), but might be helped in the near future by the rise in energy prices which have already increased usage of collective forms of transport in recent years in several countries. It is essentially a political choice as to how much policy wants to constrain freedom of choice and, most importantly, of how much money to invest in the infrastructures and operation of collective forms of transport. The decoupling of transport growth from economic growth seems beyond the reach of policy to implement, as it represents a fundamental shift in the functioning of the economy.

  A major contradiction between policy goals, nonetheless, is that between the desire

for more spatially balanced development on the one hand and for less transport on the other. Increasing accessibility almost invariably increases transport flows, and distributing activities and people across the territory as well, and so the question can be raised as to whether a higher concentration of population in central metropolitan areas is not more efficient in terms of transport.

- Calls for territorial governance, i.e. policy making which takes a given territory as its base and integrates different sectors, stem from the idea that many policy fields converge in a given territory and that they should, therefore: be treated jointly; that the subsidiarity principle should hold and that many aspects of regional development should be dealt with at the regional level. The latter point is often linked to notions of territorial capital and endogenous development. It also implies a certain degree of autonomy in the decision-making processes of regions. It is obvious, however, that not all regions are endowed with the same territorial capital and elements such as path dependency, and agglomeration economies actually favour those regions which already have good endowments of territorial capital. Thus, this endogenous and autonomous approach bears within it the risk of reinforcing regional egotisms, especially from the successful regions, and thus of countering the solidarity principle which is necessary for cohesion.

- One of the ideals in European spatial planning seems to be the organisation of settlements into compact structures, countering urban sprawl through densification of the urban cores and through the regulation of land use outside the cities. One essential element that is often overlooked is that of land (and house) prices. Apart from economic and demographic dynamics these prices are to a large extend determined by land-use policies (zoning) and (public and private) housing programmes, and are one of the most powerful vectors determining the structure of urban spaces. Unless mechanisms are found that allow a certain control of these prices, it seems illusionary to think that policy can influence urban structures significantly, unless it turns to authoritarian practices.

- European integration ("deepening") is often seen as a fundamental goal of European policy, and in the field of territorial development this seems particularly important in light of some pan-European needs such as, for example, transport and environmental protection. However, integration, including, for example, freedom of movement and growing common decision-making, carries the risk of erasing cultural differences and identities by imposing centralised policies and identities on regions, thus contradicting the desire to maintain local cultural heritage.

8. Policy messages and recommendations

8.1 Policy recommendations

8.1.1 Introduction

Policy recommendations translate into policy priorities and policy instruments the path developed in the proactive scenario to arrive to the territorial image of Europe 2030.
At the same time, these priorities and instruments propose possible ways EU, national and regional / local authorities might react to the main challenges faced by the EU territory as a whole as well as its specific territories according to the prospective scenarios (baseline, competitive, cohesive) developed in this project.
These challenges are, in many cases, cross-sectoral and thus there is a need for integrated interventions and strategic planning.
Policies are classified into "General' and "Territorial". Changes in General EU policies are a pre-requisite to implement Territorial policies successfully – our main objective. "General' and "Territorial" recommendations have been divided into several thematic groups. Finally, we provide a short list of policy options for each macro-region.

8.1.2 General policies

More active policy making - Better Governance

Challenges
Important spatial disparities will remain till 2030 on the EU territory, even in the hypothesis of strong cohesion policies. Competitiveness policies will not lead to a desired level of global competitiveness without serious negative effects to cohesion. The challenge consists in implementing a more active (not necessarily "more public") policy, better adapted to the prospective challenges (for competitiveness, cohesion and sustainability) mainly through better governance, since most of the possible solutions are inter-sectoral and inter-regional.

Policy options
- Promote redistribution of parts of the productivity gains to salaries and taxes, in order to support internal demand, and to more possibilities for active policy making
- More attention should be given to improve governance at EU, national, regional / local levels; it is necessary to go beyond the Open Method of Coordination by improving the linking of sectoral policies and different spatial levels, both in design and implementation; in this direction, it is necessary to more closely control implementation by using more extensively appropriate progress indicators and associate more strictly EU and national finance to the results achieved.

Global competitiveness: Priority to entrepreneurship, innovation, education

Challenges
Europe has to deal with rising external competition not only from USA and Japan, but also from new large economies (China, India, Brazil) in several sectors, including sectors in which Europe has advantage, such as high technology, dynamic services and tourism. Maximisation of research / innovation in the entire EU will not be achieved without the enhancement of the relevant capabilities of the countries / regions lagging behind in this

sector as well as the sound improvement of networking in these fields. Entrepreneurship and innovation will not be improved enough without a sufficient quantity of well educated human potential.

Policy options

- Targeted support to Europe's high competitiveness sectors, such as biotechnologies, energy, transport and bio products.
- enhancing the foundation of new firms, spin-offs, start-ups by creating a culture of entrepreneurship and by fostering a business-friendly environment
- significant public and private investments in new technologies, research and R&D, but also in other productivity-enhancing measures (organisational, IT-use, etc.)
- EC controls/supports the implementation of this priority by national governments
- significant public and private investment in education and training (including mainstream school system);
- Enhancement (by innovation and other means) of the environmental, cultural and social quality of European tourism in order to better exploit its resources and raise its competitiveness as well as to support local development and protect social and cultural identities and physical environment

Social Cohesion and Sustainable Demographic Development

Challenges

EU will face up to 2030 very important pressures on its social model and demographic structures which could have considerable negative effects on its competitiveness. EU should improve and expert its social model instead of importing the US model. In particular, while increased immigration might aggravate social tensions, at the same time, immigrants could provide the necessary human capital.

Policy options

- Promote selective, but substantial immigration together with active integration policies for immigrants and groups originating from immigrant families (language, education, accommodation etc.)
- Fighting all kinds of discriminations on the labour market, enhancing employment opportunities for poor and other weak social groups (education and training, specific provisions etc.)
- Development of sufficient and affordable child care facilities as well as special services and technologies for the elderly.

Environmentally Sustainable Development

Challenges

Without a proactive energy policy to make the European economy less dependent on imports, EU will face energy scarcity. Without promotion of clean energies, the pollution of the environment by emissions will continue. Balance between water supply and demand will be worsened, especially in areas prone to drought. Impacts of climate change and climate hazards will rise considerably.

Policy options

Sustainable, less externally dependent EU energy sector

- support to the move towards a more intangible economy to reduce energy consumption
- support to the development of new energy technologies (bio fuels, hydrogen technology, etc.) and use of alternative energy systems such as solar and wind

energy, biomass, etc.
- support to technological development in the transport sector to reduce the dependence on oil as well as emissions
- support to the implementation of energy efficiency measures and further technological development

Protection of water, water efficiency

- support to technological development in the protection of water and water efficiency
- CAP should focus on water stress, by promoting the cultivation of less water-demanding crops
- Particular attention should be given to more cautious use of fertilizers.
- EU policies should support research in the field of new, less polluting fertilisers.

Mitigation of climate change hazards

- more active policies to face impacts of climate change and climate hazards, such as droughts, forest fires, floods, loss of biodiversity

Sustainable Transport sector

Challenges
Coping with an impressive rise in mobility together with rapid technological changes in transport in a context of expensive oil prices. In addition, emissions from transport will presumably remain high and accessibility disparities between central and peripheral regions of Europe will remain important despite predictable improvements.

Policy options
- Taxation and pricing policies (e.g. road pricing) to limit the use of unsustainable transport modes and to finance development of sustainable transport modes
- Support to technological development in the transport sector to reduce the dependence on oil as well as emissions
- Revision of the *White book on Transport*.
- More efficient support/control of the entire effort by the EU via (notably) reallocation of budgetary resources to transport
- More public-private partnerships as well as privatisation of networks could contribute to provide the necessary financial resources for transport systems' improvement as for example in the railway sector. But this should not be done at the expense of the safety and the balance between transport modes and territories.
- Support to the technological evolution of transport systems in Europe.
- Support to the development of new engine technologies (hybrid cars, fuel cell engines) reducing both energy consumption and polluting emissions, despite somewhat higher investment costs in the short term.
- Promote the generalisation of Intelligent Transport Systems, combining information flows and transport flows to substitute physical mobility.

8.1.3 Territorial policies

Balanced Economic Development

Challenges
The catching-up process of lagging regions in terms of innovative economic development will be insufficient up to 2030 even in the competitiveness-oriented hypothesis. Thus, territorial capital of a considerable number of regions risks not being exploited enough. In

addition, competitiveness in more transport dependent peripheral regions risks being reduced because of high energy prices.

Policy options

- Accelerate the achievement of complete territorial coverage of affordable broadband (wireless) communication networks using peer2peer networking technique; improve e-learning opportunities for citizens, students and employees as well as e-governance. Priority should be given to ultra peripheral, low density, depopulating areas and specific geographical regions with limited networking services.
- Particular support of policies at European level for certain technology clusters in specific locations (implying a more active European-level governance of technology / industry policies) without locking European development into certain technologies. Particular support should be given to local SMEs and researchers which have already demonstrated ability for restructuring, development and competitiveness as well as to regions lagging behind in this field.
- Innovative tailor-made solutions per region/area to support environmentally and socially sustainable tourism and protect cultural heritage, especially for the Mediterranean region and the Alpine Space, the coastal, insular and mountainous areas.
- Enhance the market opportunities and the human potential assets of the EU by improving its external accessibility, especially its transport links with the neighbouring countries; this will mostly profit the peripheral regions.

Europe-wide level disparities - New global integration zones

Challenges
Economic disparities between East and West, as well as between metropolitan regions and lagging rural areas will continue to exist up to 2030. Private investments in a number of less-favoured peripheral regions will remain low. Differences in accessibility between the pentagon, widened and expanded through major corridors, and peripheral regions will remain significant despite transport investments in favour of the latter, because of high energy prices. While the expanded pentagon will retain its primacy, a major challenge consists in quickly promoting integration of other areas into potential Global Integration Zones (GIZ).

Policy options
Promote infrastructures and human capital (language, training in sectors of relevance etc.) for the potential Global Integration Zones (GIZ) by implementing a global approach for each of them and giving priority to the links of the respective networks of MEGAs and cities. EU sectoral and structural policies should prioritise the improvement of the development capacity and accessibility of these regions.

Intermediate (meso) level - cross-border/transnational cooperation

Challenges
Polycentric development and territorial integration at transnational and cross-border level driven by networks of cities will presumably remain weak.

Policy options
Support territorial cooperation / networking of neighbouring regions and countries inside the EU as well as with its neighbours - including corresponding rural areas and their small cities and towns - in the context of global strategies, giving priority in appropriate sectors for each case, as for example innovation, education, employment, trade, tourism, preservation of

cultural and environmental assets. More attention should be paid to strengthen the internal links in macro-regions as well as North-South links in Central and Eastern Europe and West-East links in Northern Europe.

Socio-spatial integration and equal distribution of public / social services

Challenges
Territorial aspects of the problems of growing immigration, demographic ageing and decline, social segregation, non-equitable provision of public / social services will be very important at the horizon of 2030. A lot of solutions are needed at the regional and local level. Relevant challenges are more important for certain zones such as the wider metropolitan regions, areas losing population or very sparsely populated, mountainous and insular areas.

Policy options
- Integration of immigrants, poor and other weak social groups in socio-spatial structures mainly through integrated regional / local programmes combining education, employment, housing, local environment amelioration interventions; priority should be given to wider metropolitan regions, areas of tourism development, etc. as well as to the regions with high percentages of immigrants, especially at EU's external borders (Southern Spain, Italy and Greece, France, etc.)

- Development of sufficient and affordable social services (health, education, child care facilities, facilities for the elderly etc.) in remote, sparsely populated and depopulating areas; innovative solutions for the provision of such services in the countryside, especially in the very sparsely populated areas.

A more decentralized energy system

Challenges
Increasing prices of oil and gas and progressive depletion will have a considerably negative impact on the economic activity and global competitiveness of the EU, even more in less developed regions where more investments will be made in intermediate technology sectors. Retardation in promoting clean energies will also have highly detrimental effects on the quality of the environment, favouring the revival of traditional energy sources such as coal, more detrimental for the environment.

Policy options
- EU should be more competitive in sectors related to renewable energy technologies. A number of regions, not necessarily in the pentagon, could take advantage of this evolution and develop significant amounts of exports towards other European regions and also towards non-European countries.
- Obsolete energy systems should rapidly be replaced by more modern ones, including renewable energy sources. Among other possibilities, the use of renewables should be promoted in local combined heating / electricity production at neighbourhood and individual household level.
- Structural policies should pay more attention to energy issues and allocate a higher amount of resources in less developed regions to support measures of energy savings (including modernisation of energy systems) and of diversification of energy supply sources. In this respect, the catching up process of the new member countries in the energy supply and energy transport sectors would be significant.
- The TEN-E should be further developed, mainly to the benefit of less developed countries and regions (central and eastern Europe, European peripheries).
- Decentralised systems of energy production -based on solar and wind energy as well as the production of energy crops- and distribution should be developed in rural areas together with their small and medium-sized towns, making them more energy

efficient and reducing their external energy dependency. Particular support should be given to the creation of new regional energy production and supply companies as well as to farms in the countryside for becoming energy self-sufficient. Energy production will be a new source of income for farmers and rural areas in general, contributing to stabilise rural economies in a more competitive context.
- Efficient regulations are necessary to avoid damages to natural and cultural landscapes in the case of wind energy, as well as detrimental effects for the environment in the case of mass production of energy crops.
- EU structural and rural development policies should play a major role in the implementation of these options, allocating substantial resources by priority in less developed rural regions, especially in the new member countries and in other peripheral regions.
- Policies for urban regions and metropolitan areas should favour energy savings as a better integration of urban functions generating less mobility and promote environmentally-friendly technologies (hybrid cars) which contribute to improve the quality of the environment (air quality, noise level).

Water stress, water protection

Challenges
Water shortage will increase, affecting mostly Southern Europe, as a result of climate change. Floods will also be amplified due to climate change, causing damages, especially on riverside areas across Europe. Intensification of agriculture in certain rural areas causes increase of water pollution, which leads to an increase in drinking water production prices.

Policy options
- EU policies should support investments in water-saving irrigation techniques as well as in desalination plants in rural areas, especially in Southern Europe.
- National and regional actors should inform citizens on how to reduce water consumption of households, particularly in areas where there will be an increase in water demand, such as in the New member States.
- Funding of prevention measures against floods, such as shaping of river beds, designation of emergency water retention areas.
- Control and limitation/prevention of (new) settlements in areas particularly endangered by natural disasters.

Nature and biodiversity protection

Challenges

In growth regions, urban sprawl causes the fragmentation of natural areas. In addition, development of infrastructure, tourism, second homes, and intensification of agriculture put pressure on unique natural landscapes and wetlands of coastal areas as well as on forests.

Policy options
- Management of urban sprawl through specific policies and land use regulations, especially in the pentagon area, but also in and between well performing metropolitan areas in Central and Southern Europe.
- Better management of Natura sites on national level by implementation of the necessary measures, actions and interventions needed for an effective operation of protected areas; further implementation of networking and interlinking of natural sites and protected areas of regional, national, transnational and EU level importance.
- Reduction of excessive building pressure and of large-scale agriculture on sensitive and unique ecosystems (coastal areas, deltas, forests) through specific land use regulations and management.

- Support of agro-tourism and low-intensity unprofitable farming areas in order to prevent abandonment of depopulating areas.
- Improvement of forest management, support to forestation and fire prevention.

Adaptation of areas subject to heavy impacts of climate change and climate hazards

- diversification of tourist offer and other economic activities in areas subject to heavy impacts of climate change (mountains, coasts).
- exact evaluation of local and regional climate hazards and investment in adaptation measures, including, if necessary, relocation of settlements.

Better balanced accessibility, more sustainable transport

Challenges
The continued increase of energy prices will have significant impacts on transport technology development as well as on mobility of goods and on the behaviour of European citizens regarding mobility. Bridging the accessibility gap between the wider pentagon and peripheral areas appears to be less obvious than expected while the impact of high energy price on transport costs is detrimental for remote regions. The acceleration of the globalisation process could lead a number of countries to adopt an excessively liberal market-oriented approach, with a revival of motorway programmes and the abolishment of restrictive measures to road transport with significant negative effects on energy consumption and environment pollution.

Policy options
- Greater attention should be paid to a better balance of transport modes by promoting road pricing as well as significantly efficient railway and waterway systems. In the countries of central and Eastern Europe, obsolete railway systems should be modernised by priority, in order to limit the predictable excessive growth of road and motorway traffic by providing a wider choice of modes.
- More support and investments on public transport, mainly in cities and metropolitan areas including the respective wider surrounding territories, to create opportunities for commuting as well as for weekend tourism.
- In disperse settlements areas and in areas undergoing a huge population decline "intelligent" solutions for providing transport services should encouraged.
- Promoting a new trend of car sharing, the search of residential locations closer to cities and other working areas.
- Expanding the network of high-speed trains within the pentagon but also in the direction of more peripheral countries (Iberian Peninsula, countries of central and Eastern Europe).
- Support should also be given to a number of strategic regional transport axes in the context of rural development plans and to the interlinking of these secondary networks with the primary, long-distance network.

Sustainable cities and metropolitan regions

Challenges
Metropolitan areas are the powerhouses of the contemporary economy, the nodes of the globalised economic networks. In order to continue to serve this purpose, they have to avoid negative agglomeration effects and sustainably manage the different needs of their population.

Policy options
- Backing metropolitan areas by mitigating negative agglomeration effects (e.g.

congestion); improving competitiveness based on innovation in urban areas.
- Encouraging home working by implementing affordable telecommunication networks; promoting innovative public transportation systems combined with restrictions to use private cars in city centres; prioritising reduction of energy consumption and use of renewable energy sources.
- Tackling social segregation by implementing integrated urban policies of social inclusion of the immigrants as well as of the poor and other weak social groups (i.e. investments in specific education and employment programmes, low-cost housing, affordable services, reduction of the energy bill.
- Reducing centrifugal pressures that lead to urban sprawl (i.e. targeted public intervention on land and housing markets).

Viable Rural Areas / Small and medium-sized cities and countryside

Challenges
A number of rural regions are facing a spiral of decline (population ageing, depopulation, negative impacts of drought etc.). Several attractive coastal areas and mountain valleys suffer from strong densification and urbanisation processes generating pressure on traditional landscapes and on natural areas. In fertile rural areas, the intensification of large-scale agriculture (export-oriented productions, energy crops) generates environmental problems (ground water pollution, soil erosion).

Policy options
- Better coordinating the development of settlements with that of transport infrastructures and services.
- Developing new "intelligent" solutions for providing public transport esp. in areas suffering from population decline.
- Conducting an affordable infrastructural policy in less densely populated territories either by concentrating the respective facilities in mid-size cities and towns which might serve as centres of provision of services of general interest (communications, health, education etc., esp. in child care facilities and specific services for the elderly) and by practising innovative forms of infrastructural provision, e. g. mobile health care services, distance learning. Emphasis should be put on territories which undergo a considerable population decline, in small island regions and in very sparsely populated regions.
- Promoting urban-rural partnerships in territorial governance.

Efficient territorial governance - more active and comprehensive spatial planning

Challenges
Prospective territorial challenges could be faced in most cases through better governance, as possible solutions imply in most cases efficient inter-sectoral and multi-level (European, transnational, national, regional, local) cooperation and management to avoid contradictory effects. This mostly concerns GIZ / transnational cooperation, wider metropolitan areas and urban-rural partnership. Improvement of spatial planning at all levels (including EU level) has crucial importance from this point of view.

Policy options
- reorientation of almost all the existing EU policies or parts of them, i.e.: Cohesion policy, Agricultural policy, Transport policy etc. (see previous sub-chapters) with focus on the implantation of territorially focused horizontal policy packages; better monitoring and control of the implementation of the spatial policy options implying, among others, more extended use of policy indicators.
- continued development of common spatial Europe-wide strategies and visions; generalised use and improvement of the open method of coordination at different

scales (including intra-national) where efficient, with more binding criteria where necessary.
- active planning, taking into account transport and energy resources.
- creation of forms of governance for metropolitan areas comprising both the city and its surroundings; more efficient urban- rural partnership.
- public intervention on land markets in order to be able to influence spatial developments; active public housing and housing market policies, including innovative solutions in regions with population decline, dealing with issues of vacancy of buildings, especially in the Eastern countries and in East Germany.
- integrated management of 'abandoned' and environmentally sensitive areas, including development of adapted economic activities, especially in the Eastern countries.
- legal framework for active and strict land use planning, implementation and control; generalised use of architectural contests for important buildings.

8.1.4 European macro-regions

North West Europe

Challenges
Disparities between NWE metropolitan areas of the core and rural and peripheral areas will continue to exist despite the catching up process of the latter. In addition, external energy dependency will increase, as renewable energy supply will not be efficient to power large cities. Air pollution of metropolitan areas will not be substantially reduced by 2030.

Policy options
- Promotion of spatial fiscal redistribution mechanisms contributing to strengthen the region's own capability to solve development problems.
- Diversification of rural areas, especially in the energy sector (production of energy crops, renewable energy production).
- Support to R&D in the core metropolitan areas, targeted in power generation technologies (i.e. hydrogen technology) and less polluting transport.
- Balanced development of sustainable transport modes: focus on rail and inland waterways.

North Sea Region

Challenges
Necessary stimulation of economic activity in port cities will cause traffic flows increase, leading to traffic congestion. In addition, support to major port cities networking through maritime transport infrastructure will cause pressure on the coastal environment and conflicts with other land uses (such as tourism, and wind energy plants).

Policy options
- Support to services and creative industries in port cities towards a more knowledge-based economy, less dependent on traditional industry and logistics.
- Improvement of multimodal accessibility to major port cities.
- Support of tourism development in rural areas, particularly along the coast and on peripheral rural areas (such as the Scottish Highlands).
- Improvement of quality of life in the above-mentioned areas through infrastructure and services, in order to attract retirees and self-employed.
- Development of wind energy plants in order to take advantage of the high wind speeds of the region, with respect to the natural environment and other land uses and activities.

Northern Europe

Challenges
Balance between urban and rural areas, in demographic and economic terms, will not be achieved by 2030 even in the cohesive scenario. Remote and rural areas in the Nordic countries as well as in Poland will continue to lose population, despite development efforts. Better cooperation is needed between the two sub-regions (North and South side of the Baltic Sea). The emigration to the West (from the Baltic States and Poland) is reduced but still continues.

Policy options
- Support to services and creative industries in port cities towards a more knowledge-based economy, less dependent on traditional industry and logistics.
- Creation of employment opportunities, notably through tourism development on the southern shores of the Baltic Sea, in order to reduce westward migration.
- Diversification of rural areas, especially in the energy sector.
- Improvement of transport infrastructure in the North.
- Intraregional co-operation programmes based on knowledge exchange and service industries.

Alpine Space

Challenges
Many alpine settlements with low accessibility and low tourism function suffer from the vicious circle of depopulation, population ageing, and a decrease in public services (schools, transportation, etc.). Improvement of the accessibility in smaller cities and towns conflicts with preservation of the natural environment and landscape. On the other hand, many settlements are characterized by high shares of secondary residences that stand empty most of the year.
Climate change induces damages from floods, storms, hangslides and avalanches. Besides, higher temperatures lead to shorter winter sport seasons.

Policy options
- Encourage regions to prepare for less snow probability by diversifying tourist supply, mainly during the summer season with niche supply.
- Improvement of child and health care facilities, as well as development of special services and technologies for the elderly (i.e. mobile health centres, social workers, advanced telecommunication systems for medical or educational purposes).
- Concentration of services of general interest in small- and middle-sized settlements, which could serve as provision centres, and at simultaneous improvement of their accessibility, where necessary, by transport infrastructure respectful of the environment.
- Prevention measures against floods, such as shaping of river beds, designation of emergency water retention areas.
- (Physically built and ICT-based) prevention and monitoring measures in regard of risks for settlements and the environment by avalanches and hangslides.
- Elaboration of planning guidelines on how to reduce secondary residences in alpine regions.

Central and Eastern Europe

Challenges

The necessary restructuring of agriculture and industry leads to considerable losses of jobs which make necessary the creation of a very important number of new jobs. Low fertility

rates and westward immigration cause depopulation. Catching up with Western Europe will increase disparities with neighbouring countries in the East.

Policy options

- Modernize the economy quickly, while creating a very important number of new jobs.
- Support to local small- and medium-sized enterprises through infrastructures (transport, telecommunications) and education of the local labour force, especially in traditionally industrial urban regions that face deindustrialisation.
- Adaptation of social welfare systems to European standards.
- Transnational and transregional co-operation with the external Eastern neighbours.

Southern Europe

Challenges

Handle growing pressure from external immigration, as well as ageing and decrease of population mainly in remote islands and mountainous regions. Develop tourism while containing excessive building pressures in coastal areas. Tackle heavy impacts of climate change in an important number of rural areas. Low-scale agricultural production of the region should cope with competition with large-scale industrialised agricultural production

Policy options

- Active integration policies for immigrants (educational programmes, social welfare, housing).
- Promotion of renewable energy sources, particularly cultivation of energy crops offering in addition wealth in rural areas.
- Prevention measures to cope with floods -such as shaping of river beds, designation of emergency water retention areas- as well as drought and desertification.
- Careful management of coastal areas taking into account environmental capacity; Development of innovative forms of tourism improving the protection of the physical and cultural heritage; support of agro-tourism in small scale agricultural areas.