

## D. Integrated competitive scenario

### 1. Objectives and principles of the integrated competitive scenario

The scenario is a prospective, policy-oriented scenario. It is based on the assumption of a significant reshaping of EU policies originating in the bad 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..) is being strengthened. Widening of the market through further EU enlargements is part of the strategy of increased competitiveness. After Romania and Bulgaria joining the EU in 2008, 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.

### 2. Hypotheses of the integrated competitive scenario

<b>Demography</b>	<ul style="list-style-type: none"> <li>- increase in selective (economic sectors &amp; destination) external in-migration</li> <li>- abolishment of constraints to internal migration</li> <li>- increase in retirement age</li> <li>- encouraging fertility rate through fiscal incentives</li> </ul>
<b>Economy</b>	<ul style="list-style-type: none"> <li>- sustained increase of activity rate</li> <li>- stronger reduction of total public expenditure than in baseline scenario</li> <li>- further privatisation and liberalization of public services</li> <li>- priority of public expenditures to R&amp;D, education, ICT and strategic external accessibility (ICT and transport)</li> <li>- more and easily accessible venture capital</li> <li>- flexibilisation of labour markets</li> </ul>
<b>Energy</b>	<ul style="list-style-type: none"> <li>- steady increase of energy prices</li> <li>- European consumption increasing</li> <li>- realisation of TEN - E: investment in infrastructure according to market demand</li> <li>- priority to alternative (non based on oil and gas), large-scale energy production for metropolitan areas</li> </ul>
<b>Transport</b>	<ul style="list-style-type: none"> <li>- continued growth of all traffic, in particular in central regions</li> <li>- realisation of TEN-T: investment in infrastructure according to market demand</li> <li>- priority to links between metropolitan areas</li> <li>- application of the Kyoto Agreement</li> </ul>
<b>Rural development</b>	<ul style="list-style-type: none"> <li>- rapid and radical liberalisation of CAP (reduction of tariffs, of budget and of export subsidies)</li> <li>- reduction of support to rural development policy</li> <li>- rapid industrialisation of agricultural production</li> <li>- strong dualisation of rural areas, resulting from market forces</li> </ul>
<b>Socio-cultural sector</b>	<ul style="list-style-type: none"> <li>- reactive management of social problems in large cities</li> <li>- increase of surveillance and security systems</li> </ul>
<b>Governance</b>	<ul style="list-style-type: none"> <li>- abolishing barriers to cross-border cooperation</li> <li>- less public intervention</li> <li>- reinforcement of the Open Method of Coordination</li> </ul>

	<ul style="list-style-type: none"> <li>- increased role of private sector in decision making</li> <li>- strengthening of the third pillar (foreign policy, justice, security, ...) of the EU policies</li> </ul>
<b>Climate change</b>	<ul style="list-style-type: none"> <li>- Moderate overall climate change until 2030 (+1°)</li> <li>- Increase of extreme local events</li> <li>- constant to increasing emission levels</li> <li>- mitigation measures based on flexible schemes &amp; stimulation of alternative technologies.</li> <li>- adaptation measures only where cost efficient</li> </ul>
<b>Enlargement</b>	<p>Continuing enlargement to widen the market:</p> <ul style="list-style-type: none"> <li>- Romania, Bulgaria 2008</li> <li>- Western Balkan, EFTA/EEA countries 2015</li> <li>- Turkey 2020, possibly Ukraine</li> <li>- Strengthening of the neighbourhood policy (Maghreb, Russia etc.)</li> </ul>

### 3. Scenario process

#### *Demographic changes and related territorial impacts*

There are major differences between this scenario and the baseline scenario, as far as demographic policies are concerned. The most significant one 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 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, although many key decision making powers are devolved to the private sector and large, including multi-national, business interests. 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 perception of 'cherry picking' workers to compensate for labour shortages in specific sectors leads to friction with some 'donor' countries who complain of losing their specialist labour. In some cases though, the income earned from Europe is being re-cycled into these countries effectively, arguably due to the clamp down on family re-unification as a legitimate reason for immigration. The social impacts of this are divisive with unregistered migrants accepting negligible wages, and overcrowding 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.

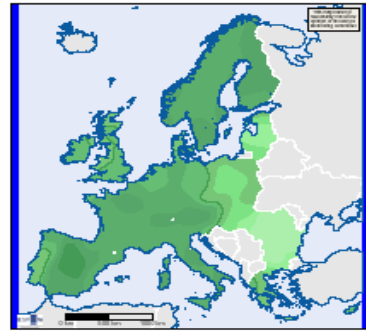
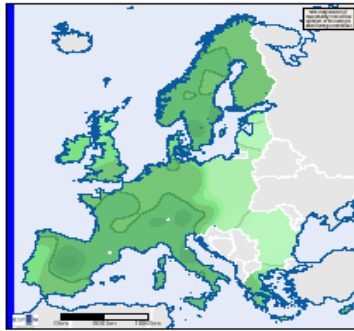
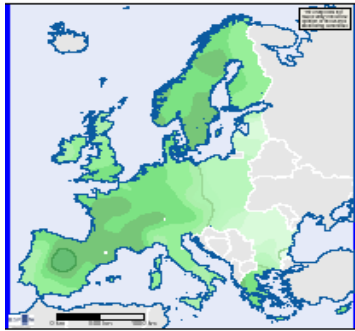
Consequently, the global European population by 2030 exceeds that of the baseline scenario. At regional level, the differences are particularly strong in Western Europe, with stronger population growth (or lower population decline) in a number of regions belonging to both the pentagon (north-west France, including Paris, Randstad, Rhein-Ruhr, Rhein-Main and metropolitan regions of South-Germany, northern Italy) and 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, the differences with the baseline scenario are less significant. The metropolitan regions of Prague, Bratislava, Budapest, Bucharest and Sofia are however clearly favoured and, to a lesser extent, the Baltic States and numerous Polish regions. Compared with the baseline scenario, the least favoured regions are rural regions, both in the centre and in the peripheries.

COMPETITIVENESS SCENARIO

2000

2015

2030



Projections based on data from UNFP 2004, ESPON database 2005 and ULB 1991

Grasland C., Guerin M., Lambert N. (2009) - UMS RATE - ESPON project 3.2

Life expectancy at birth (years)

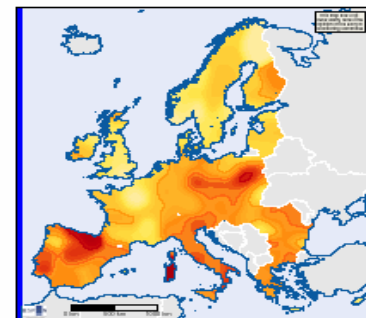
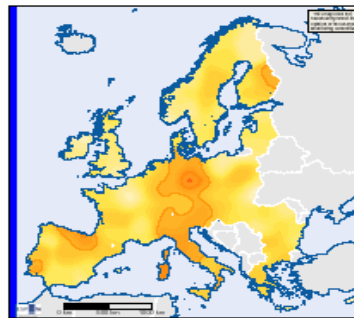
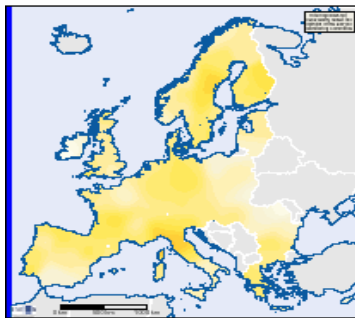


COMPETITIVENESS SCENARIO

2000

2015

2030



Projections based on data from UNFP 2004, ESPON database 2005 and ULB 1991

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Median age (years)

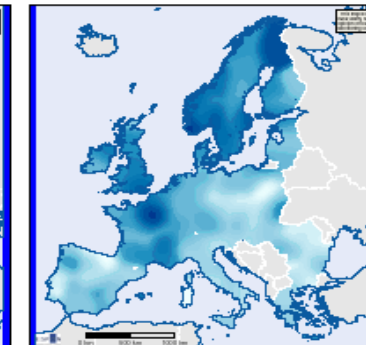
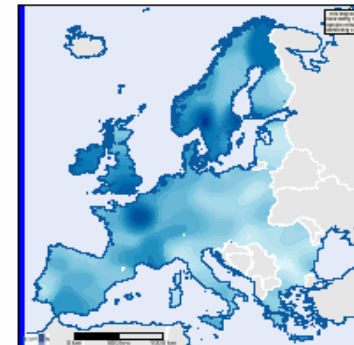
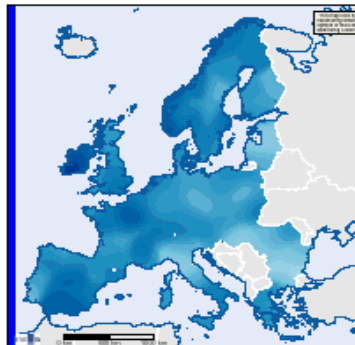


COMPETITIVENESS SCENARIO

2000

2015

2030



Projections based on data from UNFP 2004, ESPON database 2005 and ULB 1991

Grasland C., Guerin M., Lambert N. (2006) - UMS RATE - ESPON project 3.2

Index of Sustainable Demographic Development (years)



The demographic evolution of different types of areas is diverging more markedly than in the baseline scenario, with areas classified as vibrant in population terms becoming more so and many de-populating areas continuing to be net exporters of people – especially young people.

Compared with the baseline scenario, population ageing by 2030 is much stronger in a number of peripheral rural regions, for instance in northern Spain, southern Portugal, eastern Romania and along a stretch running from the southern parts of East-Germany to the eastern parts of Poland. Population ageing is less pronounced in northern Italy, south-west Finland, central Sweden and southern France. As there is no significant difference with the baseline scenario in terms of life expectancy, the demographic potential (index of sustainable demographic development) in the competitive scenario by 2030 is stronger in southern France, central Scotland, central Sweden, south-west Finland.

As regards total population development, it is Southern and South-Eastern parts of the European territory which are expanding most noticeably between 2015 and 2030 with interaction between North African states and the Mediterranean regions as well as Turkey being primarily responsible. This has at least the advantage of augmenting the population of two of the three quarters of the continent whose demographic decline had previously been the cause of most concern.

### ***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, 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 being 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 of the transport links with neighbouring countries. The enlargement process in Europe has been continuing since 2005. First, Bulgaria, Romania, and Croatia become EU members. Furthermore, 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 this 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 (persons/labour force, capital, 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 too low 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 to R&D policies and are in a position to take over companies located in other continents and to penetrate markets at 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 smaller than in the baseline scenario.

In the field of green biotechnologies, the development of gene-modified crops is generalising. Consumer protection is being somewhat reduced and decentralized responsibilities are transferred to national authorities. Large agricultural and food companies benefit more from the outputs of research and are more capable to meet the requirements of consumer protection (as far as a well functioning regulation on the respective national levels does exist). Due to lacking economies of scale, SMEs cannot easily survive. Regions with intensive and productive agriculture, especially the most central ones, are the main beneficiaries. Disparities between East and West are increasing because of growing dependency of the agricultural sector from producers of GM seeds which are typically located in Western Europe. Monopoly rates of return for these companies arise. 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 for health. In the absence of a strong spatial planning policy (not compatible with the liberal economic approach), the consequence is a progressive elimination of organic farms and of conventional agricultural production by gene-modified farming. As far as red biotechnologies are concerned, peripheral regions are neglected at the advantage of more developed regions making possible to support excellent research at top universities in order to strengthen them for an international competition and to avoid brain drain.

Significant efforts and investments in technological development are made in the fields of transport and energy. The hydrogen technology is being pushed and 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 motor-car industry is subject to an in-depth transformation with the mass production of electricity-powered cars based on hydrogen technology. A significant improvement of air quality, especially in cities, results from this evolution. In order to reduce the European dependence on oil and natural gas, coal gasification and liquefaction technologies are being developed with strong EU support. In addition to increased coal imports, the exploitation of coal reserves in Europe is being re-activated after 2015 when oil and gas prices have become prohibitive. Large-scale, modern industrial plants are being built in coastal regions with large industrial ports and in old industrial regions with coal mines. Nuclear energy is further being promoted, with the construction of new generation nuclear power plants to ensure the electricity supply of large metropolitan areas. This evolution is subject to serious political conflicts and civil tensions in most European countries. Efforts are also been made in the development and improvement of technologies making enabling a more efficient exploitation of renewable energy sources, including the production of new types of biofuels, the exploitation of wave and tide energy, wind and solar energy, geothermal energy. In addition to rural area, the use of renewable energy sources in cities and metropolitan areas is being boosted by incentives and support to R&D.

Broadband networks are developed mainly between metropolitan areas and large cities throughout Europe. The use of ICTs in transportation is becoming generalised. A large variety of applications in the sphere of Intelligent Transport Systems are developed and implemented to increase transport efficiency and reliability, to increase transport security, to optimise the use of infrastructure, to satisfy mobility needs etc. Transport flows are systematically accompanied by information flows, both for the transport of goods and persons. 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.

### ***Regional patterns of economic evolution***

A primarily efficiency-oriented policy does not explicitly recognize equity objectives. De facto this efficiency-oriented policy enhances tendencies of spatial concentration in Europe. Among the most benefiting regions are those which already showed a good endowment with knowledge society-related resources at the starting point, i. e. at the beginning of the 21st century. The ultimate use of the criterion of scientific excellence for the public support of R&D investments de facto means that the strongest are supported to become stronger. Beneficiaries are the best performing

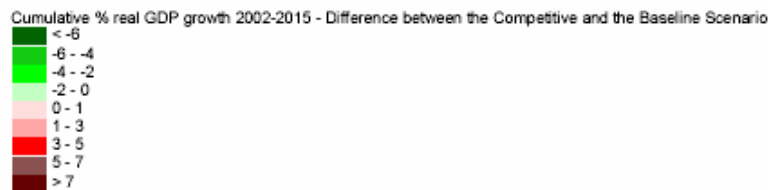
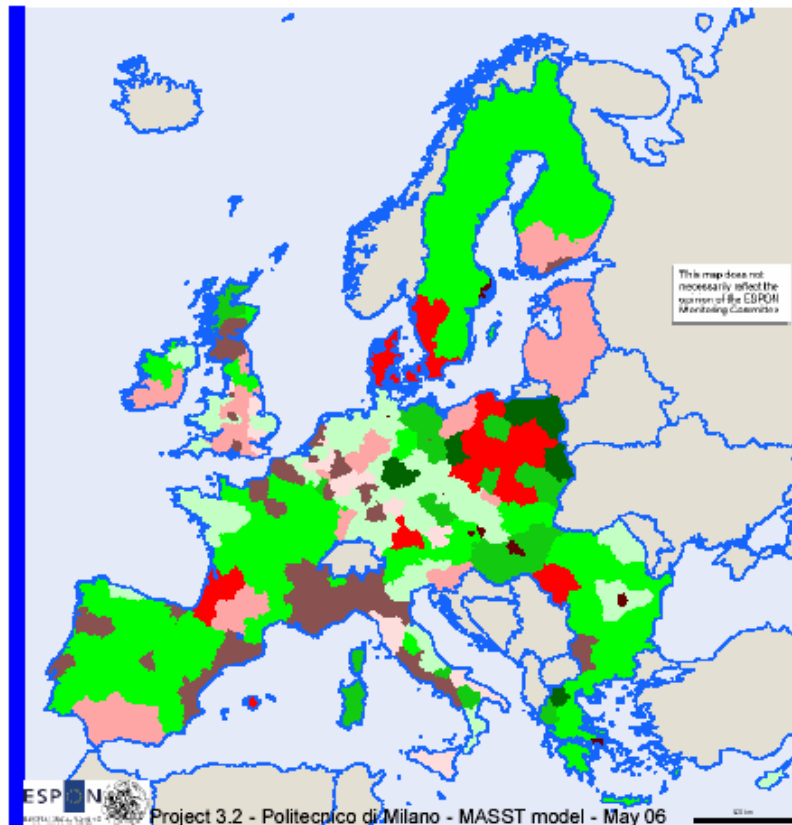
research institutes, universities and firms, which are mostly located in the European Pentagon and in a number of agglomerated spaces in the countries at the European periphery. The absence of a strong regional policy component, especially of a cluster policy which tries to strengthen clusters in disadvantaged regions, leads to the situation that a number of highly agglomerated spaces are quasi 'naturally' privileged as locations for an intensive cooperation in the fields of new key technologies. There, the high density of R&D activities and business activities allows at best a strong trust-based cooperation between research institutions and companies and between companies across different sectors.

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. With significantly weaker cohesion-oriented structural support, with 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 into strategic infrastructure, human resource development and entrepreneurship. Polarisation of the European territory increases significantly. 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 migrations of labour force. 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.

The competitive scenario registers a more expansive aggregate growth rate for Europe as a whole with respect to the baseline scenario, in line with the more generous assumptions on some target variables (0.19 percentage point higher than the baseline in all EU 27). The greatest increase in the GDP growth is registered in the EU 15 (0.20 percentage point more), followed by the New 10 area (0.08 percentage point more) and by Bulgaria and Romania (0.01 percentage point more), as last ones.

With respect to the baseline, the more expansive GDP growth (until 2015) is in reality unevenly distributed in European regions. Map ... in fact shows, with respect to the baseline scenario:

- *a clear tendency towards a more concentrated development in strong areas of each country, reflecting the 'champions' growth assumptions. This tendency is confirmed by the Theil index presented in Fig. 2, where the intra-regional disparities drastically increase (and increase more than in the baseline scenario);*
- *as a consequence, in Western Europe, a reinforcement of some regions of the Pentagon area, together with most of Great Britain and Northern and Central Italy countervail the low relative performance of mainly rural areas especially of Greece, Central France, Central Spain, Northern Scotland, Northern Ireland, the north of the Republic of Ireland and Northern Scandinavia;*
- *while the most peripheral regions are those performing relatively lower than the baseline scenario, within peripheral areas, exceptions are presented by most of the Megas, reinforcing the tendency of a concentrated development. Lisbon and Porto in Portugal, Madrid, Catalonia, Valencia and Bilbao in Spain, Athens in Greece, Paris, Haute-Normandie and Nord-Pas de Calais in Northern France are all regions with a higher performance than in the baseline;*
- *while the assumptions favour growth in the megas and agglomerated areas, a less intuitive result is the good relative performance with respect to the baseline scenario registered also by the potential megas, like Cologne, Bonn, Bologna (in Emilia-Romagna), Nice and Marseille (Provence-Alpes-Côte d'Azur) and Lyon (Rhônes-Alpes), Bratislava and Budapest;*
- *the trend towards a more concentrated development is clearly evident in Eastern countries, where all capital regions (with the addition of Timisoara) register a greater performance with respect to the baseline scenario. On the contrary, in these countries, all rural areas register a lower performance than in the baseline scenario.*



Considering the changes in relative position of European regions between 2002 and 2015 compared with the baseline scenario (Map ...), winners are very clearly the metropolitan regions, both in western and in Eastern Europe, but especially in the pentagon. Regions which are most strongly losing are the rural regions of Sweden, of East-Germany and the alpine regions of Austria. Other important loser regions are the rural areas of Western Europe (central France, central Spain, southern Portugal, Ireland, northern and southern Germany, most Finnish regions, numerous Italian and Greek regions).

When looking at the per capita GDP level achieved in 2015 in the competitive scenario, some interesting patterns and trends emerge with respect to the baseline scenario (Map...):

- the *catching up process between Eastern and Western countries is more pronounced* in the agglomerated and mega regions. In Eastern countries, these areas achieve in fact, with respect to the baseline scenario, a higher per capita GDP. This trend explains the decisive increase in the intra-national regional disparities with respect to the baseline, presented by the Theil index in Fig. 2;
- a *higher per capita GDP level with respect to the baseline scenario emerges in some regions of Western Europe*, especially in the agglomerated and mega regions, in parts of Scotland, in southern Ireland and in some regions of the Pentagon area, especially in Western Germany, in Benelux and in south-eastern England;

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, thanks to strong catching up processes in lagging countries through their national champions (Fig. 2).

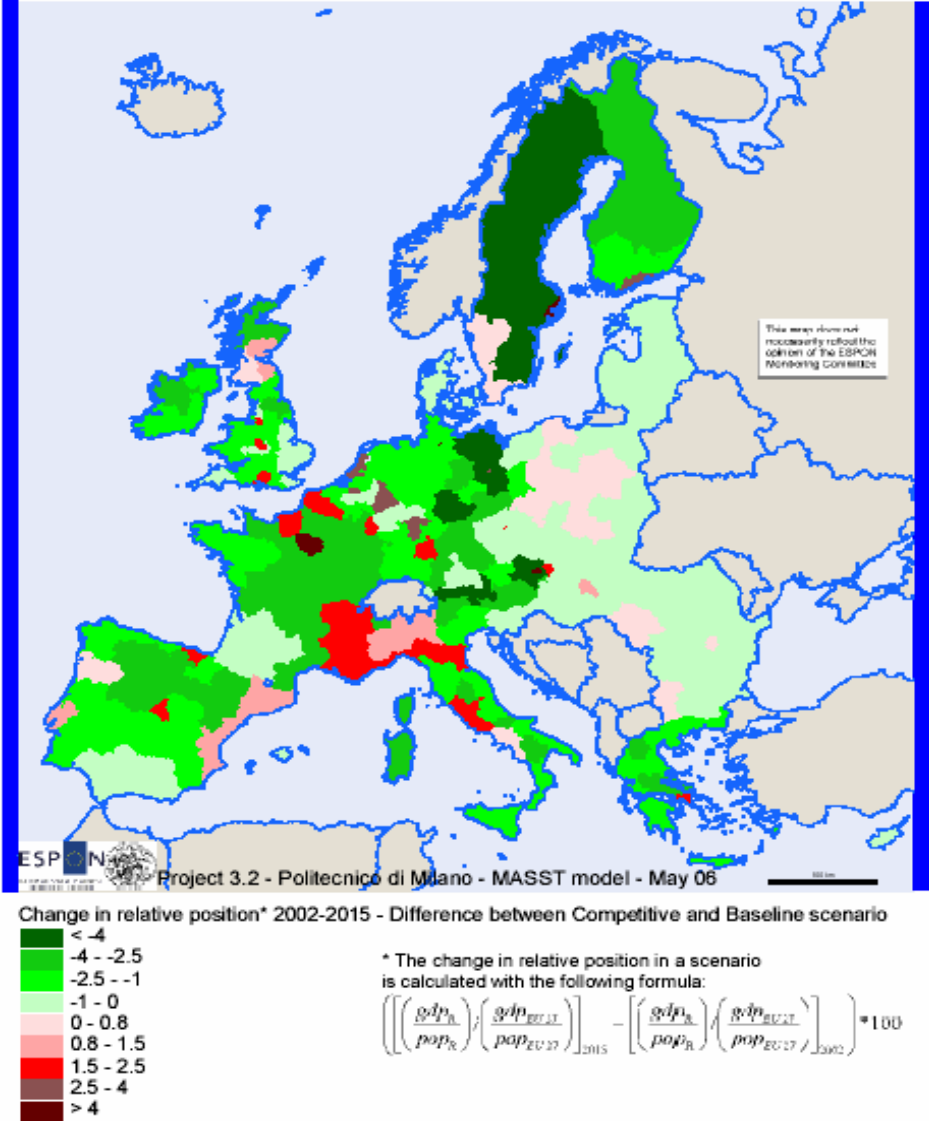
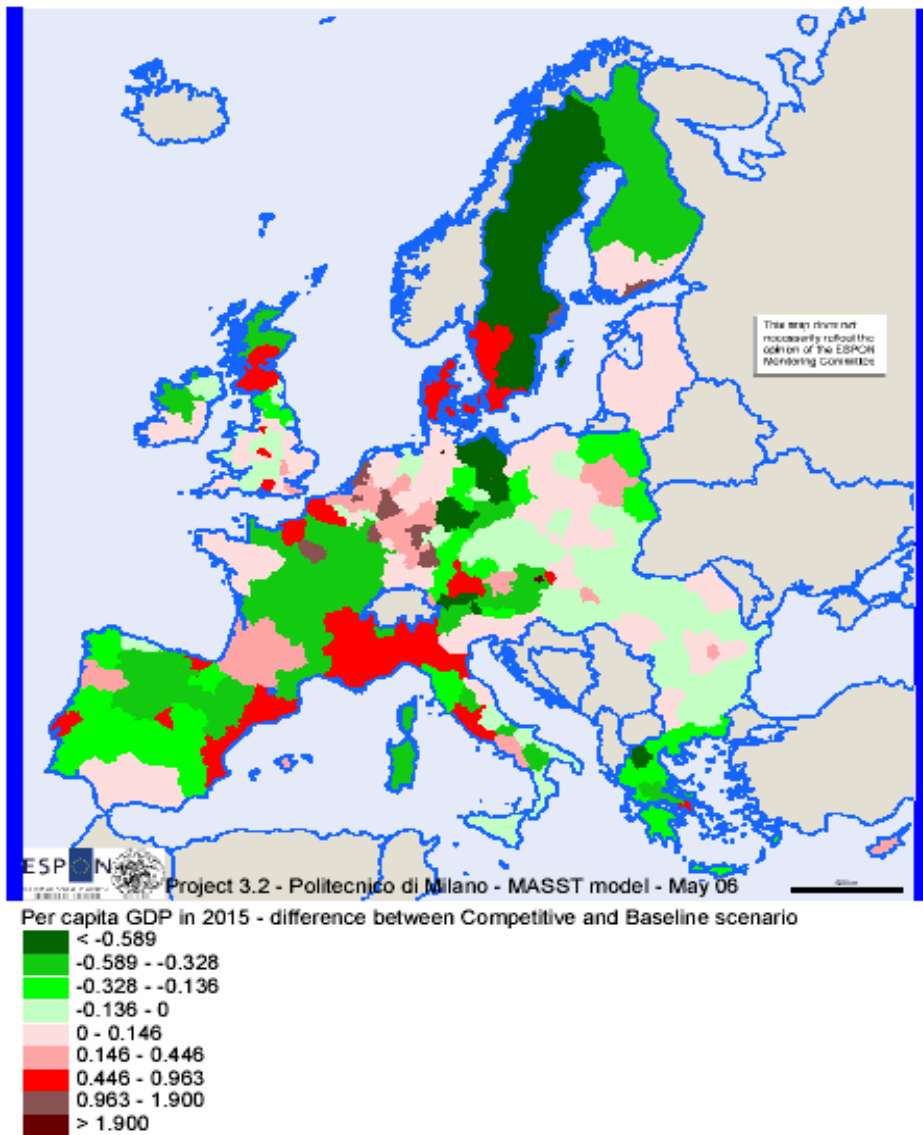
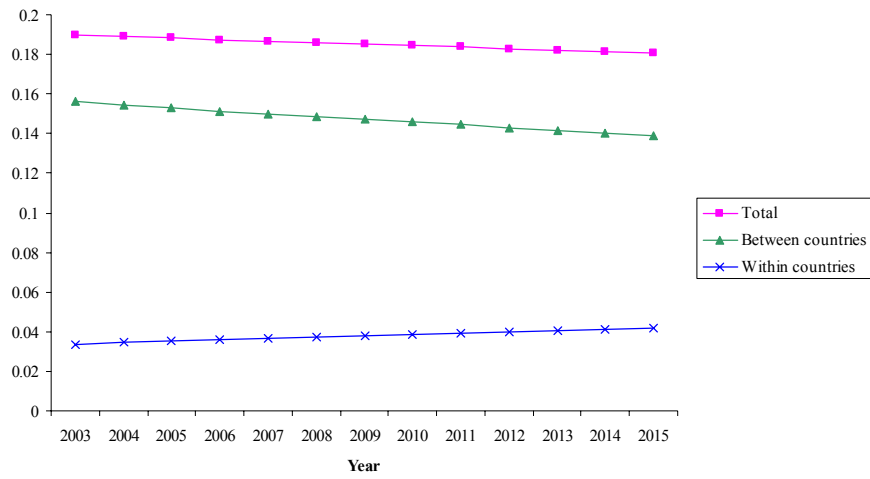


Fig. 2 – Regional Disparities in the Competitive Scenario

Theil index - Competitive scenario



Territorial integration and cooperation 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 the broadband networks. Border regions cannot rely anymore 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 respectively high unemployment rate. 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 cooperation and more generally for regional development came too early. High unemployment rates on both sides of the border enhance out-migration. As a consequence, the potential for start-ups in consumer-related services and even for cross-border activity of consumer-related businesses remain very limited. Furthermore, high unemployment leads to tensions regarding the cross-border mobility of workforce. European policy spends large sums for the reconstruction and modernisation of Trans-European road and rail networks. However, the border regions themselves gain only little benefit from this. They remain more or less transport corridors, whereas the agglomerations in the hinterland are capable to reinforce their position as centres of cross-border economic cooperation. Therefore, whereas in general terms trade and foreign direct investments between the EU member states show an increase, the border regions in the narrow sense were and still are 'jumped over'. However, not all of the European border regions show signs of backwardness and a low level of cross-border cooperation. A number of regions along the internal borders which possess sufficient 'natural' locational advantages in terms of population and business density, of existing polycentricity (as it is the case, e. g. in parts of the German-Dutch border region as well as in the Upper Rhine Region and the Saar-Lor-Lux-Region and, to some extent, at the Slovak-Austrian Border near Bratislava and Vienna). Among these regions which are capable to gain benefits from their border location, one finds primarily regions with long-lasting cross-border contacts and cultural and mental commonalities.

Rural areas are subject to an evolution which was already noticeable in the late 1990s and early 2000s consisting in a growing dichotomy between well-off and less developed rural regions generated mainly by both the 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 (the budget for Pillar 1 is reduced from € 37.5 billion in 2005 to € 4 billion in 2020 . Pillar 1 resources are exclusively used for direct payments to farmers; market support is abolished. The budget for Pillar 2 is reduced from € 7.5 billion in 2005 to € 1.5 billion in 2020). 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 and horticulture further increase in the urbanized regions of Northwest Europe. Scaling-up and clustering of farms and greenhouses reduce production costs. This sector becomes successful on the world market. Large-scale arable and dairy farming increases significantly in fertile areas with low land prices in the CEECs and Western Turkey. Subsistence farming 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. Rural areas where agriculture dominates experience an intensified dualisation. In the fertile areas of France, Germany and Central Europe, agricultural production rapidly further industrialises. 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 is particularly the case in rural areas with an

unfavourable demographic situation (high level of population ageing), unfavourable production conditions (low level of soil fertility, increasing drought) or low attractiveness. This negative evolution is also much stronger than in the baseline scenario.

## **Transport**

### *The transport context in Europe in a competitive perspective*

In the competitive scenario, the transport situation is conditioned by higher rates of economic growth than in the two other scenarios. Transport is also meant to contribute to the global European competitiveness and transport policies are shaped accordingly. The growth of transport flows is stronger than in the two other scenarios, because economic growth generates over-proportional growth of transport flows. This trend 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. As in the other two scenarios, the sustainable character of increasing energy price (in particular of oil) remains a major constraint in the transport sector. Because good transport conditions are necessary to ensure and strengthen competitiveness, significant EU resources (much more than in the baseline scenario) are injected into research and technological development in order to counteract the progressing oil depletion and the related price increase of fuel. A high level of mobility is necessary to maintain robust economic growth. The further development of high-speed train networks and the availability of substitution fuels make possible to ensure the necessary level of long-distance mobility. At more regional and local scale, however, European citizens adapt their behaviour to increasing transport costs and organise their mobility, as far as possible, on a more rational way (car sharing, public transport, change of residential location). The further expansion of metropolitan areas brings however with it 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.

### *Simulations from the KTEN model*

### *In preparation*

## **Energy**

The context of the competitive scenario is similar to that of the other two scenarios: energy prices are regularly and significantly increasing because of growing energy demand at world scale and of progressive depletion of oil and gas resources. The competitive scenario aims however at strengthening the global European competitiveness and in particular that 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. The competitive scenario concentrates also on the diversification of sources of energy supply, but not only on the promotion of renewable energy sources. It also allocates significant resources to the development of technologies which are likely to facilitate the provision of energy to metropolitan areas, such as coal gasification and liquefaction, hydrogen technologies, new generations of nuclear power plants, new types of car engines. The TEN-E are developed so as to provide in priority energy to metropolitan areas. Because of weak structural policies, EU credits for technological development and energy transport infrastructure will be allocated more to developed regions than to backward ones.

In global terms, energy consumption is not likely to decline in the competitive scenario. In a context of sustained growth policies, the weight of energy costs in the final output is less important and can be offset by other sources of added value, such as stronger technological development and

more highly skilled manpower. This means that 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) are easier and more likely to occur in a context of liberal and competitive economy. Energy consumption in transport is not likely to be significantly reduced, despite technological progress in car engines. 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 to the regions of the pentagon. 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 possible the full exploitation of the renewable energy potential of these regions. Consequently, they remain more dependent on the use of traditional fossil energy sources (oil, gas, coal), a fact which reduces their competitiveness, because of increasing prices and more and more 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 oligopoles are emerging, absorbing progressively the existing regional energy companies. Some are controlled by non-European mega-companies. Large energy companies buy or control wide areas in fertile agricultural regions (energy crops production) or in areas well suited for wind energy production.

The impact of growing energy prices on the global European economy are lower in the competitive scenario than in the baseline scenario, because of the presence of other factors boosting economic development which counteract the constraint of higher energy costs. The European economy is more quickly moving towards a more intangible and high-tech economy and is abandoning large amounts of weakly productive activities using low or intermediate technologies. This has strong territorial impacts, increasing the divide between leading metropolitan regions and other regions with traditional industries or rural character. Increasing energy prices are more detrimental to the last category of regions, because their capacity to reduce their energy consumption and to move towards innovative energy supply systems is lower. 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 on global markets. In addition, the weakness of structural policies is a constraint to the modernisation of large-scale energy and transport infrastructure.

In the competitive scenario, 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 or coal gasification have positive environmental impacts, at least in some areas. Hydrogen production requires large quantities of electricity and may therefore be polluting in places where it is produced, but hydrogen combustion is not at all detrimental to the environment and this is beneficial to the air quality in cities. The same is true for the use of hybrid cars and of gas generated by coal gasification. The rapid revival of nuclear electricity production brings with it the issues of security and elimination of nuclear waste. In fertile rural regions, agriculture is strongly intensifying, in particular there where energy crops are being produced. Fertilisers are used, endangering the quality of soils and especially of ground water. Irrigation is also intensifying, leading in certain regions to the depletion of ground water resources, with negative impacts for the water supply of cities in the region. 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. This evolution affects rather negatively the energy sector. The production of energy crops and of biomass is severely constrained by deteriorating climatic conditions. Negative impacts

on hydro-power production can also be observed. In coastal regions, wind energy parks are threatened by heavy wind storms and hurricanes.

### ***Environment***

In the competitiveness scenario, the environment fades into the background of public perception, as the health of the economy is seen as more pressing. Consequently, environmental policy is not meant to slow economic growth significantly, but must be achieved in compatibility with economic development.

In general, water stress (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. Densely populated areas in the Pentagon face water stress, especially during dry summers. Sometimes this is manifested by blackouts, as power plants are unable to feed enough electricity into the grid, because most of them, now privatised, have not implemented new water-saving cooling systems. Meanwhile, the manufacturing industry grows significantly, mainly in Central and Eastern Europe, feeding the demand for water. 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). As a result, consumer water prices escalate, which affects sectors such as manufacturing, retail and tourism. Sparsely populated rural areas in Southern Europe are increasingly abandoned and in process of desertification. In the competitiveness 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, have detrimental impacts on water quality (lower investments in urban wastewater treatment, weak application of the nitrate and framework water directives, resulting groundwater deterioration in most densely populated areas and drinking water becoming increasingly expensive). 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 hazard 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. The development of new technologies (especially hydrogen technologies, hybrid car engines etc.) contributes however to reducing air pollution, in particular in cities.

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 enough 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, coastal and arid regions resulting from climate change, applies to this scenario as well.

### **Territorial image of Europe by 2030**

Compared with the baseline scenario, the demographic situation by 2030 is less declining 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. Inside Europe, demographic imbalances have significantly increased, with a growing population in and around a large number of metropolitan areas and large cities and population decline and out-migration in numerous peripheral and/or rural areas, both in the pentagon and in more peripheral countries.

The impact of selective immigration and of internal migrations on the labour markets, especially on those of metropolitan areas, is significant, so that shortage of labour force is less perceived as a constraint to economic development than in the baseline scenario. Population of immigrant origin (both born in Europe and just coming from outside) is less integrated in the European society than in the baseline scenario because of insufficient integration policies and of a certain amount of illegal immigration still going on. Increasing xenophobia, self-protective attitudes and social unrests are more developed than in the baseline scenario.

In the context of the globalisation process, the economic inter-penetration at intercontinental scale is strongly developed in the competitive scenario, but less at 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 non-metropolitan/more rural areas is strengthening, compared with the baseline scenario.

### ***Urban Europe***

The European urban systems change under the influence of both demographic and economic factors. Liberalisation of migration within Europe combined with a more liberal approach of 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 terms of 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 investment are made in those regions that are capable of sustaining top universities, major financial institutions, research facilities and the like. This leads to the development pressures in and around urban areas for further expansion. Major urban agglomerations, especially in the pentagon, like Paris, London, Randstad and Rhine-Ruhr extend their influence into the 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 not necessarily within the administrative borders of the big cities, but rather in the Potential Urban Strategic Horizon (PUSH)

areas<sup>29</sup>. It is most probable that 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<sup>30</sup>. 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, transnational 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. There, where enterprises increasingly utilise the higher educated and skilled labour force of these countries, 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 not competitive any more in a globalised world.

While on the global stage demographic and social policies appear to maintain the total population and the competitive position of Europe, there are costs with regard to the objectives of socio-cultural integration. While there is integration in the 'market place' there is increasing 'apartheid in residential arrangements', as people work alongside each other, but return to their ethnically and religiously segregated neighbourhoods at night, protected by the ever strengthening arm of the law. The influx of relatively less educated population, added to housing problems, result in increased disparities within cities and agglomerations, in growth of social tensions and pressures for more social spending within EU and national budgets. Insecurity and social unrest are developing in large cities, despite the multiplication of electronic monitoring and security systems. 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 economic 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 cooperation between European metropolitan areas intensify, driven by the private sector, mainly the 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 to a few privileged areas with long tradition in cooperation, 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 cooperation between metropolitan areas take place on long distances. In most border regions, especially in central and Eastern Europe, short-distance cross-border cooperation between small and medium-sized urban centres is much developed than in the baseline scenario.

### ***Rural Europe***

The evolution of rural is much more unfavourable and contrasted in the competitive scenario than 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 rural regions, especially for the most remote and peripheral ones. In the competitive scenario, market forces are more important drivers of evolution 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 farmer

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<sup>29</sup> as defined in ESPON project 1.1.1. These are the surrounding areas of urban centres within reach of 45 minutes by car from the centre.

<sup>30</sup> (Raspe et al 2004)

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 the 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 in 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. These 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, stronger damages through natural hazards contribute to significantly deteriorate the attractiveness of rural areas and to increase 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, 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.

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

#### ***Atlantic Area***

By 2030, the demographic potential is higher in the northern than in the southern half of the Atlantic Area. Population ageing in the coastal regions of northern Spain as well as in central and southern Portugal has increased more than in the baseline scenario.

With EU regional policy increasingly restricted to eligible areas with high economic potential to compete on the world stage, the Atlantic Area and its modest innovative potential and high geographic distance from the core of the Union has had limited the regions' access to regional policy effort. This, together with neo-liberalist policies dominant across the Continent, has resulted in growing disengagement from the competitive core of the EU, a reinforcement of the centre-periphery model and competition between territorial communities. A few regions with large cities and advanced R&D activities have succeeded in developing competitive technological productions. In many other more peripheral regions, private investment has maintained its role as a producer of secondary goods with low added value, low wages and intensive forms of production, confronted to the increasing challenges of globalisation. This role has been supported by an increase in selective migration from outside EU providing a steady flow of temporary workers many of whom went on to supply major metropolises. The dichotomy in development is also illustrated by the Area playing host to polluting activities, and their associated risks, exported from the metropolitan centres of the Union. Only a few regions have performed better than in the baseline scenario (Lisbon and Porto metropolitan areas, Bask region, Andalusia, Aquitaine, southern Ireland and central Scotland).

Selective 'gateway' cities in the Atlantic Area have managed 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. This has benefited a few larger ports which had been losing position towards the turn of the century. 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 geographical dispersal though has followed an 'octopus' like pattern and not established new connections within the

Atlantic Area. Indeed the situation of 'losing areas' has become severe with the most inaccessible towns and rural areas in the vast inland band deteriorating, their infrastructures becoming quite obsolete, in some instances leading to desertion as minimum services are abandoned. In sum, the structural weaknesses and variation within the Atlantic Area already apparent in 2005, distinguishing for example the Greater Dublin Area and its 'Celtic tiger' successes from the underdeveloped Western areas of Ireland, has become exaggerated. Without policies in place to mitigate the most painful impacts of the market, the attractiveness of Atlantic Area locations to Foreign Direct Investment is predictably paltry with some exceptions, such as some areas in the North West of the UK which have remained attractive for advanced technology.

The two sectors which traditionally characterise the Atlantic Area have had mixed fortunes under this scenario. Liberalisation of the CAP has hastened the decline of the agriculture sector, with job losses and the closure of small farms. However 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. At the same time the increase in profitable intensive farmed fish have had negative impacts on wild salmon, water quality and the ecological balance in general, thus the long-term prospects are questionable.

Private-public partnerships have flourished which have re-invigorated other economic activities which had commercial viability. These have included marine research centres in France, off-shore oil exploration on the west coast of the UK and some isolated wave, buoy and other isolated forms of alternative coastal generated renewable energy. However lacking subsidization 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 fails to fulfil its initial promise. In terms of energy consumption the region continues to grow, 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, but this has been largely seasonal in character which has contributed to recurrent unemployment and as the market in cheap flights to more exotic, distant destinations continues to rise, the mass tourist sector has been looking vulnerable. Targeted specialist tourism enterprises, such as marine eco-tourism and aqua-sports ventures have attracted private capital and some of these have prospered.

Finally, the enlargement of the EU market together with the continued growth of energy prices has exacerbated the marginal position of the Atlantic Area, with the small compensation of some increased interchanges between key coastal capitals and external markets. The move away from 'deepening' the Union has reinforced the pre-existent weakness of trans-national links and inter-regional strategies for the Atlantic Area as a whole. Competition between nations has become the dominant focus and peripheral regions of the Atlantic Area dependency on their national capitals been retained. The competitive scenario has stimulated some innovative enterprises, but at a macro level, it has rather reinforced the marginalisation of the Atlantic Area.

### ***North-West Europe***

Regions which house a high proportion of high-tech industries, universities and knowledge-based companies have fared better in this scenario than in the baseline scenario. The changes in policy direction have produced a diagonal growth corridor from the Dutch Randstad to Austria and a north-west corridor in 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. Relatively few regions showed modest growth levels, such as the northern parts of Ireland, of Scotland and the French rural regions of NWE.

Economic growth in urban regions has affected transport flows, and consequently decision-making on new transport infrastructure. 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 to relieve some of this pressure. Examples include the E05 (Southampton to Manchester via Birmingham), E22 (Liverpool to Kingston upon Hull), and the E35 connecting the Randstad to Frankfurt via the Rhein-Ruhr region. Regional airports have developed at proximity of metropolitan areas, as travel times by road between cities have become prohibitive, despite the development of the HST network. 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 and with the lowest share of energy provided by renewables – has increased substantially, and air pollution could not sufficiently be curbed down, 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 external and internal borders to selected 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 old industrial areas like the Ruhr area and Lancashire population decline has been even stronger than in the baseline scenario since these areas were not successful in restructuring their activities.

Regarding urban growth, the Pentagon in NWE has significantly expanded along major corridors, so that by 2030 it stretches until Dublin in the west. 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 the metropolitan regions despite rising energy prices. This is particularly true in areas which are dominated by urban networks like the Randstad and the Ruhr area. Immigration into NWE has been sustained, particularly in the global cities and European engines. Although the integration of immigrants 'in the marketplace' is relatively high, increasing territorial segregation has taken place. This is particularly true for the low-skilled and often illegal immigrants. Most of these people have settled in the least favoured districts of these cities. This has caused more overcrowding and housing problems as well higher insecurity and unrest. Immigrants are less integrated than in the baseline scenario because of insufficient integration policies and continued illegal immigration. Xenophobia and social unrests have developed not only in the global cities but also in the European engines and the MEGAs. In large cities, numerous no-go areas as well as privately protected gated communities have emerged. Suburbanisation is stronger than in the baseline scenario.

Partnerships between local authorities have intensified not only in urban networks like the Ruhr area and the Randstad but also between urban fields surrounding cities like London, Paris, and Brussels. The partnerships are concentrated on industrial estates, residential areas and transport infrastructure. Selective cooperation and the use of binding instruments have made the partnerships successful to a large extent.

Emission levels from transport and industry have been increasing, because the Kyoto agreement and its successors were only weakly implemented. Consequently, air quality has remained a problem in metropolitan areas with highest economic and demographic growth figures, like London, Paris, and parts of the Benelux. Landscapes around metropolitan areas have become diversified, but very fragmented, due to market forces that require both recreational values and affordable expansion for businesses and residential areas. High-tech agriculture has become a growing sector, claiming areas around transport hubs in the Netherlands, Germany, Belgium, Northern France and England. Natural hazards caused by climate change have generated severe damages, especially through flooding, because prevention measures were kept to a minimum.

### ***North Sea Region***

In the competitive scenario, the port activities have shown a renewed vigour, with remarkable growth rates being realised 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 the Northern Netherlands and Northwest Germany, but to a lesser degree. All in all, however, the competitive scenario has been relatively advantageous to the NSR in terms of economic growth, even with respect to the baseline scenario, which was already quite favourable. In addition, as the Baltic member states gained economic importance, this provided additional demand for goods, which could easily be shipped via the North Sea. Much of this additional growth has been achieved in services and creative industries rather than traditional industrial or logistic sectors. Consequently, by 2030, the restructuring towards a knowledge-based economy has been more prominent relative to the baseline scenario.

The differing degrees of economic growth in the NSR had spatial ramifications. First of all, the stimulation of economic activity in urban port-related areas has intensified the spatial developments identified in the baseline scenario. There has been increasing freight traffic on roadways and over the water, and increasing passenger traffic on roads, 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 roadways 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 somewhat by intensified short-sea shipping, and in some cases by coastal airports. Like the other scenarios, maritime traffic, over time, has come increasingly into conflict with other land uses, such as wind parks and oil and gas extraction and has threatened natural habitats.

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 along the North Sea coast where many knowledge workers settled. In some peripheral areas, like central Scotland and southern Sweden, population increased more than in the baseline scenario, but rural areas like Lincolnshire, Groningen, and Jutland saw a relative fall in population.

Metropolitan areas were the main locus of demographic development. Urban agglomerations like the Randstad Holland have extended their influence into the 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. Areas with old industries like Leeds and Sheffield and smaller seaports like Stavanger, Esbjerg and Delfzijl have been negatively affected. The same is true for inland areas in 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 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 segregation and insecurity in the cities and environmental decline caused by growing traffic.

Agriculture has evolved into a more competitive sector on the world market in this scenario. Specifically, intensive agriculture has flourished in densely populated areas around transportation hubs. Despite EU regulations, nitrate levels are also on the rise. The response to increased flood frequency has been to raise the level of river dikes. Like in 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 became further fragmented, or disappeared altogether. The Natura2000 goals were difficult to realise since many conflicts arose with economic interests; gas and oil extraction took place in Natura2000 areas like the Wadden Sea. At the same time, technological evolutions made wind energy more profitable, leading to large wind energy parks in the open sea.

## ***Northern Europe***<sup>31</sup>

The impact of the drive for greater competitiveness across Europe has not been uniform in the BSR/NP area. In demographic terms, the NP area and the southern shore of the Baltic both saw continuing population decline, as economic opportunities aggregated towards urban centres and, in Poland and the Baltic States, rural areas continued to shed population as the agricultural sector was comprehensively restructured. The Nordic capital regions on the north shore of the Baltic however experienced a significant influx of people – though not to the city centres themselves – which remained 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 benefited, given their advantageous positions in terms of high-tech industry development and/or port facilities/transportation. On the southern Baltic shore, western emigration continued, but at a lower level as internal economic development proceeded, while, after further EU enlargements in the 2020s, countries like Poland themselves became the recipients of a significant influx of new labour from the east.

Economically, the ‘competitiveness drive’ significantly privileged urban over rural areas, as the ‘equalisation’ ethos of the cohesion scenario was replaced by a focus on emphasising ‘indigenous potentials’, which effectively reinforced already strong economic areas at the expense of weaker ones. Similarly, high-tech sectors and their ancillary service partners were stressed at the expense of traditional industrial production – though some ‘traditional’ sectors such as mining did survive and indeed prospered in the NP area in particular. Economic growth remained above the EU average for both the Nordic capital areas and the countries on the southern shore of the Baltic, though the latter continued to suffer from the 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 was significant across the BSR/NP area as at its northern and southern extremities a profound ‘shake up’ occurred 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 increased over the baseline scenario.

Similarly, the impact on the agricultural sector has also been significant, as the end of the CAP, combined with global agricultural ‘liberalisation’ in the WTO context, severely impacted on the ‘marginal’ NP agricultural areas in central Sweden and Finland and the unreformed agricultural areas of Eastern Poland. Commercialised ‘industrial’ farming of quality consumer-driven products however boomed in the agricultural areas close to the Nordic capital regions.

This propensity towards ‘urban crowding’ had potentially quite significant environmental and transport related impacts in the areas concerned, as transport and housing endowments were put under significant strain in the Nordic capital regions, while the NP area and certain parts of Poland suffered such that essential basic services were no longer automatically provided in certain areas due to population decline. Environmentally, emission levels as motor vehicle ownership continued to rise, while the pressure on water levels and land for housing construction increased dramatically in the Nordic capital areas. Meanwhile, as in the other scenarios, energy price rises remained a constant and a mix of nuclear power and ‘alternative’ energy production in the Nordic countries provided the desired policy mix. For the southern shore of the Baltic, nuclear energy was again stressed, though the new ‘eastern’ members who joined in the 2020s had very significant problems with their antiquated nuclear facilities, which required 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 increased dramatically after further EU enlargement.

## ***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

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<sup>31</sup> Baltic Sea Region and northern periphery.

innovation takes place because private companies have even topped 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, Northwest Italy, the region of Munich and also Slovenia, whereas more minimal growth has been witnessed in Austria, Southern Germany, Northeast Italy and the Aosta region. Thus, Tyrol and the Vienna region have lost the most economic importance in comparison to 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, in the forefront Munich, Lyon, Nice and Milan, have also developed a very strong service sector offering many additional jobs. To maintain the activity rate and compensate for the missing base of young people of working age, high-skilled workers were obtained from outside the EU, and the retirement age was increased. However, compared to the baseline scenario the average life expectancy at birth in the Alpine Space has slightly decreased, most of all in the Western Alps. 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 have 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 until 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 in 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 tourism 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 mounted 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 needle ears in European North-South connection. These tunnels, which have been enlarged and modernised, are not sufficient to meet the amount of traffic. Thus, the planning of their redimensioning to enlarge their capacity and for new tunnels has begun.

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<sup>32</sup>***

In the countries of central and Eastern Europe, population has been decreasing everywhere, with the only exception of Albania. Strongest declines have been experienced in the Baltic States, Hungary, Romania and Bulgaria. (7-10 %). This evolution is partly due to the natural population movement but mainly to international migration. The main difference to Western Europe, however, has been in the size and direction of migration flows. Until 2015-2020 central and Eastern Europe has been one of the major sources of migration to Western Europe. After this time, however, the Eastern member states have become also destinations of immigration, mainly from non-EU25 countries. Their relative wage level (compared to EU average) has increased and their demographic situation has become even more critical than that of Western countries. A growing number of Turks have been migrating to Hungary, Romania and Bulgaria, and a growing number of East Slavs to Poland, the Czech Republic and Slovakia, South Slavs to Slovenia (the similarity of language made the environment more familiar and integration easier).

Natural population increase in this scenario is smaller than in the other scenarios, especially in the Eastern parts of the region. The expected improvement of total fertility rate has not taken place, or improvement has been much weaker than expected. Job security and confidence in the future were important factors of fertility, and security has not increased substantially in the peripheral territories of the EU, even less in the countries outside the EU. Additionally, migration from Eastern Europe to Western Europe has continued, mainly to the core areas (Pentagon). Differentiation of demographic trends has increased also within countries. Population decline was especially strong in rural areas within the countries. The population of big cities and their agglomerations has increased more rapidly. Parallel with dramatic decline of the total and rural populations, the population of great agglomerations has continued to increase.

The decline of population has seriously affected the economy of the respective countries. The maintaining of public services has become more costly and less efficient. Depopulation has affected the various types of settlements differently. Large urban housing estates, accommodating nearly 50 percent of the Eastern European urban population have lost most of their former dwellers. Small rural settlements have been left by almost all their active population. Only elderly people remain there without social care and public services. Abandoned housing blocks have been occupied by illegal migrants and other deprived groups of population (Roma, etc.)

Economic development has continued to be somewhat more dynamic in the peripheral areas of Europe than in continental core areas. Economies have been further restructured: material-energy- and transport-intensity of the economies has decreased. The share of services in the GDP has further increased, economies have become more open: the volume of exports and imports increased more rapidly than production. Beside these positive features of development, a number

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<sup>32</sup> Former CADSES area.

of serious structural weaknesses and problems remain however in the economies of central and Eastern European economies. The carrier of growth has continued to be almost exclusively foreign direct investment. Increasing FDI has been very beneficial for the countries, but especially in the case when giving an impetus to local suppliers and utilising local human, natural and service resources. FDI and growth continued to be restricted to a few regions, mostly to capital regions, western border regions and major ports. Development has slowly spread to other regions. Regional disparities increased - or did not decrease sufficiently. The most dynamic sectors, the real carriers of growth have been trade, commerce, 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, large disproportion between these sectors and industry and agriculture have somewhat jeopardised competitiveness and equilibrium. The gap between large enterprises (owned mostly by the state or foreign investors) and very small 'micro' enterprises, owned by local people has increased. This means also that the gap between highly mechanised, high-tech plants of multinational enterprises and local 'micro' service firms without employees has further increased, while strong and competitive small and medium size firms continued to be missing in the enterprise structure. In close causal relationship with the former problem, employment has not increased parallel with the dynamic growth of GDP and unemployment has remained rather high in most countries and regions of the area. But unemployment is only one symptom of underemployment. The more serious problem has been low activity level. Activity rates decreased dramatically in some countries in the one and half decade between 1990 and 2005: many people retired early, many women left the labour market, others gave up the hope to find 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, the economic and trade relations remain unbalanced. Foreign trade continued to be concentrated on one or a few large developed country (Germany, Italy) and trade relations between the countries of the region remained on a rather low level.

Enlargement has progressed dynamically in this scenario. The West Balkans, Turkey and possibly Ukraine are becoming members already in the late 2010s and, perhaps, further countries join the EU (Belarus, Moldova, some countries of the Caucasus) in the 2020s. The main motives of enlargement are the need to enlarge the market as well as political considerations: to ensure a stable political environment for the European economy. The heterogeneity of the European Union has further increased. The political resistance to enlargement by a number of the more affluent member states has been dissipated with the knowledge that Community resources are being directed primarily towards 'elite' areas, rather than to cohesion countries. The new entrants, benefiting from much less support than that received in the past by new member states, orient themselves towards benefiting from the common market.

The actual EU average share of agricultural employment did not decline at all up to 2015, because in the meantime Romania, Bulgaria and Croatia, with very high agricultural employment joined the EU.

While agricultural employment in the Western countries was already fairly low and therefore the impacts of further decreases were rather limited, a much more dramatic decline has taken place in some Eastern member states, where it was extremely large in the nineties. This extremely high rate, registered in the 1990s, was an anomaly even in these states. It increased so steeply in the 1990s, because - after the collapse of industry and after the abolishing of agricultural cooperatives and the re-privatisation of agricultural land - many people returned to the rural areas in the hope to ensure their existence and living in 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 residence.

While CAP support declined and was shifted towards Pillar 2, an equalisation has taken place between Western and Eastern farmers. Despite the relative improvement of the situation of Eastern ones, Eastern agriculture - because of its mere size - has set free much more people than the Western one. In Romania the employment share of agriculture in the early 2000s was 36,8 percent, in Poland 19,3 (in Southeast Poland 33 percent), in the Baltic States 33 percent. By 2030 it has been reduced to a third or quarter of the former share. Agricultural overpopulation is a serious problem also in Greece (Traki, Kriti, Peloponnisos, Dytiki Ellada). The liberalisation of

agricultural trade (Doha agreement) affected seriously just the same regions, because their production structure was very similar to that of the main non-EU competitors. The setting free of labour force has been more intensive where large farms are the dominant form of agricultural 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 are the most critical regions. At the same time, these large – and cheap – agricultural lands have 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 of central and Eastern Europe have undergone a substantial shift 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 has developed, employing very few people. These large farms could stand the pressure of global competition. Large farms dominated already in the Czech Republic, Slovakia, in Eastern Germany, in Northwest Poland. After 2010 a rapid concentration has taken place also in Hungary, Romania and Bulgaria. These farms produce the dominant part of staple agricultural products. Less fertile or less favourably located areas – especially those dominated by small farms –have been increasingly affected by competition from agricultural production. The luckiest of them could change the profile of their activity (rural tourism, traditional handicrafts, organic farming, or simply keeping the land in weeded condition and living on subsidies). An adverse development in the distribution of rural population eventually occurred: the more fertile areas have lower, less fertile areas higher density of agricultural population. Despite the reduction of subsidies, agricultural population density remained high in areas where no other employment opportunities emerged (South-east Poland, North-east Romania, South-east Bulgaria, Ipeiros, Peloponnisos, Kriti, Calabria, Galicia). 'Dualisation' in rural areas became even more marked. 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) declined radically and a highly mechanised grain production and animal husbandry emerged. The same happened in the Danubian Plains (Austria, Hungary, Slovakia, Romania, and Bulgaria). In the mountainous areas of the Alps, Carpathians, and Sudets, where mechanised agriculture is 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 remained still lower in the East. This has been one of the factors supporting Eastern competitiveness, the other being the radical increase of farm size and the radical decrease in the number of farms. It means, however that in the new member states about 10 million 'jobs' have been lost in rural areas, and only a part of them was compensated by jobs development in other sectors. The largest rural losses of jobs have been experienced in Romania, Bulgaria, Poland and in the Baltic States.

### ***Southern Europe***<sup>33</sup>

The opening of external borders, even on a selective basis, is the most important driver of demographic development in Southern Europe. The regional impacts are however very contrasted. While regions with important metropolitan areas or attractive living conditions 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 or southern Italy. By 2030, the demographic potential is still strong in southern France, Cyprus, Crete, 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, Bask region,

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<sup>33</sup> European Mediterranean regions and South-West Europe.

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/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 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.).

## **Conclusions: territorial issues arising from the baseline 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 and central / 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 accessibility between the pentagon and the more peripheral regions has not been reduced, on the contrary, because transport policies have favoured the development of corridors between large metropolitan areas and the increase of energy process has been more detrimental for peripheral regions.

### ***Intermediate level***

The divide between metropolitan regions and rural regions has strongly increased, both in western and in central / Eastern Europe. Territorial integration has progressed in the form of long-distance networks and cooperation 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 more in a position to supply the surrounding countryside with services and jobs.

## **Policy messages from the scenarios**

### ***Basic messages***

A number of policy considerations result from the elaboration and confrontation of the three integrated scenarios, keeping also in mind the outputs of the numerous thematic scenarios elaborated previously.

The first basic message is that the European territory will be confronted in the coming decades with a number of new challenges, independently from the fundamental policy options related to cohesion or competitiveness. In front of these new challenges, current policies appear insufficient or not adequately targeted. New policy approaches will be necessary in future, departing in many respects from the policies applied up to now. More information about the future territorial challenges and the related policy requirements will be provided hereafter.

The second important message is that the long-term evolution of European regions (more than 20 years) may significantly differ from the evolution in the short and medium-term (up to 15 years). Examples from the past are illustrative in this respect. The economic evolution of the Portuguese regions or of those of the so-called 'Third Italy' has been considered during many years as quite promising and these regions were shown as European examples of successful 'catching up' or 'economic take off'. More recent evolution since the beginning of the present decade, has however shown that insufficient technological inputs in industrial production and too modest advanced service industries were jeopardising the long-term continuation of this so far promising evolution. Looking at the long-term future, the question can be raised if the catching up process observed in the new member states is likely to have everywhere a long-lasting character. The same issue also exists in Western Europe, with regions which had so far a stable economy but may become severely hit by the challenges of globalisation.

The third message is that market forces and the general evolution of the European society have and shall have in future a very important impact on the evolution, compared with the impacts which may be expected from public policies. Although the hypotheses of the various scenarios vary significantly in terms of basic priorities and resource allocation, the regional patterns of development resulting from the scenarios are not fundamentally different, even if distinct characteristics cannot be overlooked.

## ***Main challenges***

### *The demographic challenge:*

The demographic evolution of Europe is a long-lasting issue. The decline in fertility rates which started several decades ago, has resulted in a situation where the median age of the population is starting to grow significantly and the continuation of this evolution over the next decades is unavoidable. Whatever measures will be taken in terms of family policies or liberalisation of immigration, the impact will remain limited, although non negligible, especially in the short and medium-term.

Demographic challenges are however not homogeneous across Europe. The map representing the index of sustainable demographic development in 2030 shows rather significant territorial differences. Two clusters with a relatively strong demographic potential emerge: one stretching from south-east France towards Ireland across the Paris region and southern England, the second encompassing southern Scandinavia (Denmark, the southern regions of Norway and Sweden) and Lapland. The demographic potential of Southern Europe is particularly weak (except southern France, Crete and Cyprus), but is slightly above that of central and Eastern Europe where most regions are affected by the combined impacts of low fertility rates over long periods and very low life expectancy.

Compared with present policies, future policies will have to be more ambitious in terms of support to families and of maintain of reasonable conditions of life in the regions most affected, in terms of services, income and job opportunities and accessibility. In central and Eastern Europe, in addition, health and child care are particularly serious issues for increasing life expectancy.

Migrations and especially immigration from outside Europe is a second important issue in the demographic sphere. The negative impacts of the natural demographic evolution on regional labour markets will call in a few years for the need of allowing substantial immigration of qualified people into Europe. The competitive scenario, allowing this possibility, shows that selective immigration will benefit primarily to already well developed regions and will somewhat enlarge the extension of the clusters which have a rather strong demographic potential.

In addition to selective immigration (so far left to the initiative of individual countries, but possibly with EU intervention in a few years), other forms of immigration are likely to continue or intensify (political refugees, illegal immigration etc.).

The issue of socio-cultural and economic integration of immigrants or of people born in Europe but originating from immigrant families will become a major issue in most European countries in the coming decades. Present evolution shows that successful integration is only possible up to a certain proportion of immigrants in the total population and provided that substantial and efficient integration policies are applied (which are so far just experimented at small scale in various regions and cities).

With regard to the territorial impacts of future demographic issues, the scenarios show that these will largely contribute to increasing existing imbalances: higher fertility rates will be found mainly in well developed regions of Western Europe (with a few exceptions such as Crete and Cyprus). Immigration (both legal and illegal) will benefit more to metropolitan areas (especially those of Western Europe) than to less developed rural areas. Progressing depopulation in remote rural regions is likely to generate long-lasting negative spirals of decline which will then make efforts of regeneration extremely difficult and costly. Various demographic factors will however be compensating for or attenuating the comparative advantages of more developed regions. The issues of socio-cultural and economic integration are mainly concentrated in large cities. In addition, further growth of metropolitan areas may generate negative impacts such as growing land and housing process, increasing traffic congestion and suburbanisation, thus progressively limiting the attractiveness. Numerous retirees are likely to leave large cities and to move towards attractive rural areas, strengthening the residential economy of these regions.

In conclusion, issues generated by the demographic evolution in Europe in the coming decades will call for ambitious, but differentiated policy solutions, according to the individual regional contexts. As demographic factors interfere with many other issues, more integrated policy approaches will be necessary.

#### *Challenges related to accelerating globalisation*

Even if the policy response to accelerating globalisation is presently considered to be the Lisbon Strategy, the consideration of long-term perspectives in this respect may provide new insights into the real challenges to which European regions might be confronted in future.

The economic evolution has a much stronger volatility than the demographic one. Regional foresight research carried out in the past decades has very often substantially underestimated the scope and nature of economic adjustments and re-structuring, and therefore their real territorial impacts.

A particularly important impact of globalisation is that it increases the scale and size of businesses. The wave of mergers and acquisitions which characterises the present period as well as recent years seems to be the forefront runner of much more substantial transnational and intercontinental economic interactions likely to intensify in the coming decades. The level of global economic leadership which European enterprises will gain, maintain or lose will very much depend upon the evolution of their competitiveness in the global context, but also upon their economic penetration and organisation at intercontinental scale. The still important fragmentation of the European economy is a significant handicap in this context. As liberalisation will be further progressing, especially in the competitive scenario, it is likely that activities which traditionally belonged to the public or semi-public sectors, such as rail transport, water and energy supply, health care etc. become, after privatisation, externally controlled by non-European companies. Signals of such an evolution can already be perceived to day.

A particular aspect of globalisation is the resurgence of heavy industries pushed by the enormous demand for basic products and equipments in the large emerging economies. The rapid and significant price increase of raw materials, which is taking place simultaneously to that of energy products, is a sign that large industrial, transnational and intercontinental conglomerates will dominate the world production of metals and basic chemical products (hydrogen liquefied or gasified coal etc.). What is really at stake is the part which European enterprises will play in this process. This evolution shows that accelerating globalisation does not imply only a further move towards the information and service economy.

In addition, as Europe cannot compete in the field of wage levels, the vertical segmentation of functions in enterprises will be more and more accompanied by a spatial spreading of these functions throughout the world, according to the balance between skill requirements, wage levels, final markets and economic security. For European regions, this has meant so far and in many respects, relocation outside of Europe (or –for a transition period- towards the less developed regions of Europe) of enterprises' functions which can be carried out with low wages or which are necessary to penetrate the growing markets of emerging economies. It is quite likely that competition – and the necessary economic adjustments – will in future not be only based on differences in wage levels, but more and more on technological productivity (combining technological outputs and prices). External competition will therefore increase in a number of sectors for which Europe had up to now comparative advantages and it will not be limited to industrial production, but will increasingly affect the service sector and activities related to the knowledge economy.

The territorial impacts of accelerating globalisation are likely to be manifold. It is rather difficult to anticipate with reasonable probability, especially in the long-term, which areas will benefit most from the globalisation process and which ones will be negatively affected, because the diversity of possible manifestations of the globalisation process is not yet predictable. What is however rather probable is the multiplication in the coming decades, of so-called asymmetric shocks which are likely to hit areas with very different economic characteristics in Europe. The competitive scenario

shows that policies targeted at promoting global European competitiveness will generate a somewhat higher global economic growth in Europe, but also that territorial polarisation will significantly progress with metropolitan regions drawing higher benefits than less urbanised regions. This may however generate an important social cost or collateral damage, with a number of regions losing their vitality.

Spatial and regional policy responses to the process of accelerating globalisation will have to consider increasingly the diversity of possible impacts and opportunities generated by the globalisation process as well as the multiplication of their occurrence. They will have to create and consolidate regional environments and milieux in order to make them more robust and resistant to external challenges, while empowering them to throw arrows likely to penetrate the very large markets of the emerging economies. Agglomeration and network economies, innovative milieux, clusters of technologically advanced activities, good accessibility and availability of highly skilled and creative manpower will be more and more required. Further progress in reducing the fragmentation of the European economy, especially in the context of forthcoming EU enlargements, will also be a prerequisite.

#### *Towards a new energy paradigm*

The third fundamental challenge for European regions in the coming decades will be to successfully implement the change of energy paradigm. For more than one century, the availability of oil and, more recently, of natural gas has made possible the considerable expansion of industrial countries during the 20<sup>th</sup> century. World resources of oil and natural gas are progressively being depleted in a context where the expansion of large emerging economies creates an environment of strongly growing demand. While resources will become more and more scarce, their price is likely to considerably increase, a trend which has started in the year 2000 when a barrel of crude oil was only \$ 9 worth, to reach \$ 70 by 2006. With the progressive depletion of European oil and gas resources in the North Sea, the external dependency of Europe in the field of energy is likely to increase substantially until 2030.

The oil and gas economy has penetrated most sectors of economy and society (transport and mobility, housing, industrial production, leisure and recreation, agriculture, services etc.). Changing the European energy paradigm can only be achieved in a long-term perspective with considerable efforts and investments. Territorial impacts are likely to be very significant. These have to be anticipated in the context of spatial development policies in order to avoid inconsistencies, conflicts and insufficient productivity. In addition, spatial development policies will have to facilitate and contribute to the change of energy paradigm.

In this respect, the first objective is to increase the energy efficiency of existing systems and therefore to curb down energy consumption. In territorial terms, this is related to the level of mobility of society, to the intensity and density of transport flows, to the evolution of modal shift, to the morphology of agglomerations (more or less compact, with functions more or less integrated or segmented), to the insulation of buildings etc. the second objective is to favour the development and to optimise the use of renewable energy sources. This objective has very strong territorial dimensions, such as the location of residential and productive facilities in relation to climate conditions, the exploitation of local and regional renewable energy sources (solar, wind, tidal and other hydro-electric energy, biomass etc.), the prevention of land-use conflicts related to the exploitation of such resources (production of biomass versus food production; development of wind parks versus protection of landscapes and development of tourism etc.). The third objective is to ensure security and sustainable territorial development in relation to the location and development of conventional and innovative large-scale energy supply facilities (nuclear power plants, coal gasification and liquefaction facilities, hydrogen production plants etc.). the scenarios have shown that the policy choices may have very different impacts in terms of energy efficiency, reduction of the dependence from oil and gas, sustainability of energy systems, etc. While the competitive scenario favours the emergence of large-scale technologies which are promising for the future (hydrogen technologies coal gasification and liquefaction, nuclear fusion etc.), it neglects the exploitation of renewable energy sources in remote rural areas which generally needs incentives to really emerge. On the opposite, the cohesive scenario pays particular attention to renewables in

rural areas and less developed regions, but it shows drawbacks in terms of technological innovation and breakthrough of new energy technologies and bundling of sufficient resources to enable their industrial implementation. In order to successfully move towards a new energy paradigm, a combination of the policy approaches proposed in the various scenarios will therefore be necessary.

#### *Acceleration of climate change*

The fourth significant factor challenging the competitiveness, cohesion and sustainable development of the European territory is the acceleration of climate change. This has numerous and significant territorial impacts. It is now widely admitted that the increase of greenhouse gas emissions is one of the main factors responsible for growing average temperature and for the related natural hazards.

With regard to the territorial impacts of climate change, a distinction must be made between those which have a temporary and local character, but may generate significant local or regional damages (floods, heavy rainfalls, storms, landslides etc.) and those which have a more sustained character (drought, elevation of snow altitude in mountains, rise of sea level, evolution towards a moderate climate in northern regions etc.) which have long-lasting impacts with negative or positive character.

Climate change can hardly be curbed down through policies within a period of 20 or 30 years. An immediate and drastic reduction of greenhouse gas emissions at world scale would certainly not have significant impacts on the climate before the year 2050. This does not mean that such measures would be neutral in territorial terms. A drastic reduction of greenhouse gas emissions would for instance imply substantial changes in mobility patterns and transport systems. The scenarios do not concentrate however on such measures likely to have an impact on climate change after 2050. The deliberately attempt at showing that different policies targeted at alleviating the territorial impacts of climate change (and not at climate change itself) are likely to have very different effects in terms of territorial evolutions. Basically, the policy measures which are at stake are prevention or adaptation measures. Prevention measures are generally expensive and need incentives or support, especially in weaker regions. The counterpart is that physical damages caused by natural hazards or long-lasting economic drawbacks can be significantly contained and reduced. While measures like the implementation of retention areas along rivers are essential in limiting the impacts of flooding, regions affected by sustained drought in Southern Europe may benefit from measures limiting water needs (such as irrigation), maintaining activities in agriculture and forestry through the adaptation of productions and practices in order to prevent wilderness and forest fires. Neglecting prevention and mitigation measures, as shown in the competitive scenario, may lastingly affect the economy of numerous areas in the long-term and counteract the objective of territorial cohesion.

Climate change is likely to have manifold manifestations and impacts in future. These have to be systematically monitored and anticipated in order to define the measures which are best suited to the regional contexts. Issues related to climate change should become in future a specific part of regular territorial development activities.

#### ***Other policy issues***

The four main challenges facing future territorial development and cohesion in Europe described above are not the only ones which can be anticipated by the various scenarios, but they have a dominating and relatively new character. Other challenges and issues are also identified which have consequences for territorial policies. These are in particular:

- the need to limit the multiplication of unproductive heavy infrastructures with low leverage effect on private investments in less developed regions at the expense of more global competitiveness;
- the need to take more into account the regional and local specificities and potentials of the territory when conceiving and implementing public policies, favouring better synergies. This is not neutral in terms of territorial governance;

- the fact that various policies have different impacts on territorial integration and cooperation at cross-border or transnational level, some favouring networks between metropolitan areas, others cross-border cooperation between less developed regions, especially along external borders;
- the high probability that enlarging significantly the EU territory without maintaining and deepening policies favouring cohesion may have in the long range detrimental impacts not only on territorial cohesion, but also on global competitiveness;
- the need to use efficiently the new opportunities which will be offered to rural areas, such as the residential economy or the production of energy crops form maintaining a sufficient vitality and level of services and for counteracting the decline which may occur in other sectors of the rural economy (traditional agriculture, obsolete industries);
- the need to organise in a sustainable way the territorial development of metropolitan areas which will be subject to further growth, under the influence of market forces, independently from the public policies pursued.