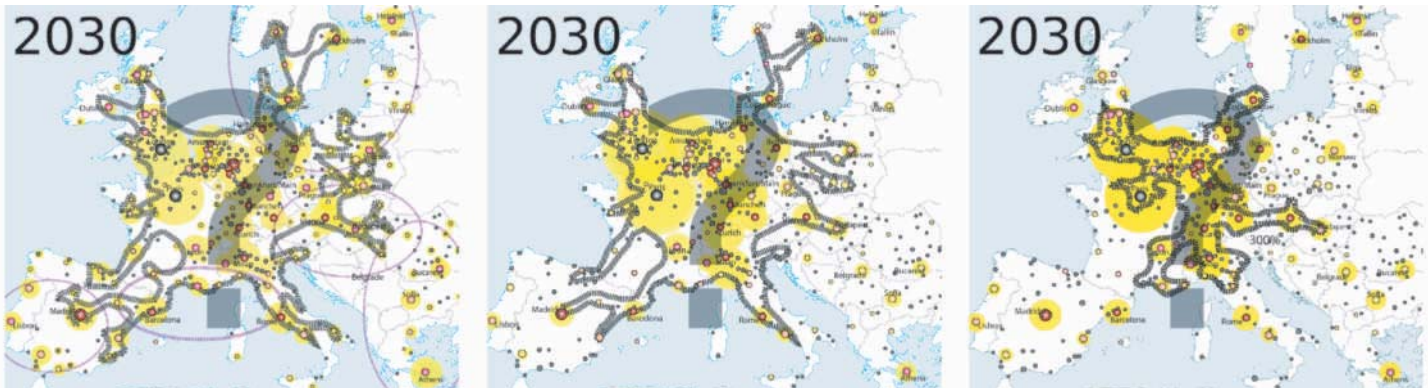
ESPON

EUROPEAN SPATIAL PLANNING
OBSERVATION NETWORK




# Territorial futures

## Spatial scenarios for Europe

Part-financed by the European Union within the Interreg III ESPON 2006 Programme

# SPATIAL SCENARIOS

This document provides a brief summary of a new ESPON report on Spatial Scenarios for Europe, which explores contrasting scenarios for the development of the EU territory. The ESPON Monitoring Committee, including policy makers from all EU Member States, Norway and Switzerland, has guided the elaboration of the scenarios. The content of the scenarios, however, remains the responsibility of the researchers and consultants that carried out the project.

The spatial scenarios were elaborated by a trans-national project group within the ESPON project 3.2. The researchers used a mixture of qualitative and quantitative approaches and modelling techniques in their scenario-building exercise. For more information, see volume 4 of the final report of ESPON project 3.2 available on the espon.eu website.

This report was written by Jacques Robert (TERSYN) and Moritz Lennert (IGEAT-ULB) with the help of the entire ESPON 3.2 project team.

For more information on the ESPON 3.2 Final Report and on the entire ESPON programme and projects, please see http://www.espon.eu.

The web site provides the possibility to download and examine the most recent documents produced by ongoing ESPON projects.



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# NEW CHALLENGES

The European territory is presently faced with a number of important challenges. The recent enlargements have created unprecedented disparities between European regions in terms of wealth, development opportunities, accessibility and environmental quality. External factors such as accelerating globalisation, increasing energy prices, immigration and climate change will also leave their mark on Europe's territory, as will 'internal' factors like population ageing or regional economic development. In addition, public policies, including those set at the European level like the Lisbon and Gothenburg strategies, can influence the evolution of the territory – even if they are not primarily aimed at doing so.

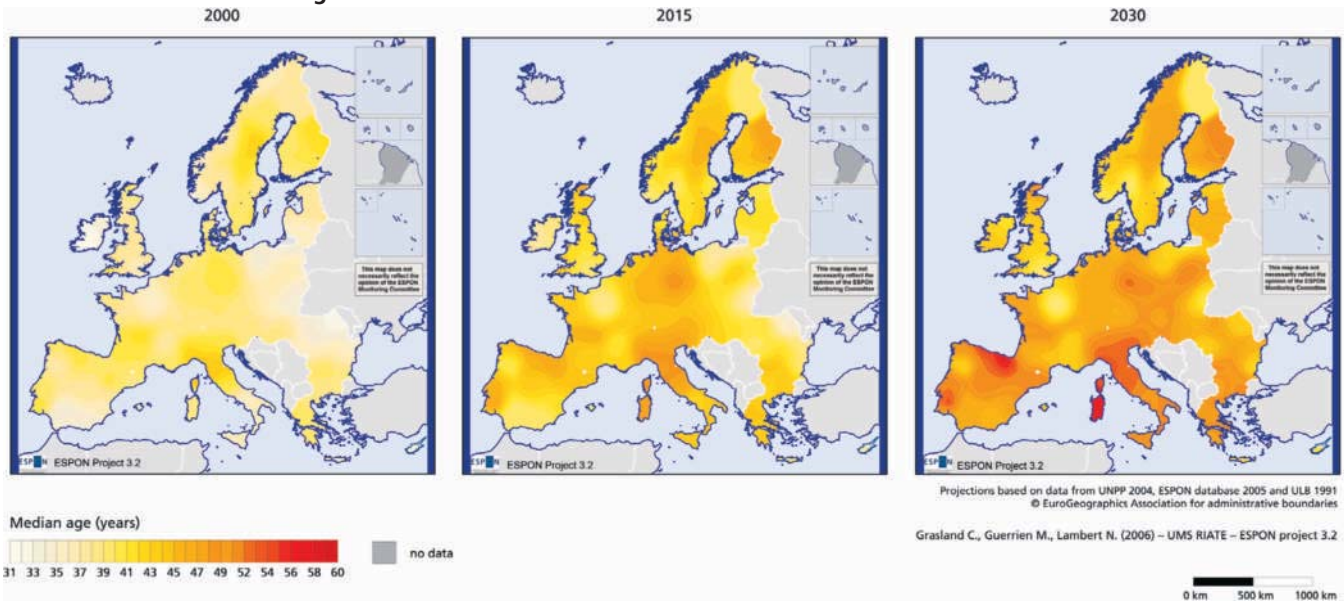
Before long-term policies can be defined or improved, however, it is essential that decision-makers be made aware of the driving forces which will shape territorial developments in the decades to come. It is also of primary importance to understand the power, scope and limitations that their policies have in influencing territorial developments.

To this end, the ESPON programme  has elaborated a number of contrasting scenarios investigating the likely territorial impacts of the challenges mentioned above on the territorial structure and balance of Europe and on regions, urban and rural areas. Prospective policy scenarios present images of possible territorial futures following the implementation of a different policy mix. The scenarios are not to be seen as predictions, but as likely images of the future.

A trend scenario highlights the impacts of the most relevant driving forces in a practically unchanged policy context. On the basis of this trend scenario, two policy scenarios were elaborated. In one, policy is oriented towards enhancing the competitiveness of Europe in the global context. In the other, the policy focus is oriented towards economic, social and territorial cohesion.

Comparing the outcomes of these two scenarios provides important insights into the effects and limitations of each policy mix in influencing the developmental path of the European territory, including its competitiveness, cohesion and level of balance. The scenario exercise also highlights the spatially differentiated impacts of policies, and thus the importance of taking into account the territorial dimension in policymaking.

**Trend Scenario: Median age towards 2030**




*Map based on demographic projections elaborated in the ESPON 3.2 project.*

## Current trends

The trend scenario illustrates the likely impact of a number of major developments on the European territory. This impact will occur at different scales - from the global to the more regional and local – and cannot be ignored by policymakers.

## Europe and its people: Demographic evolution

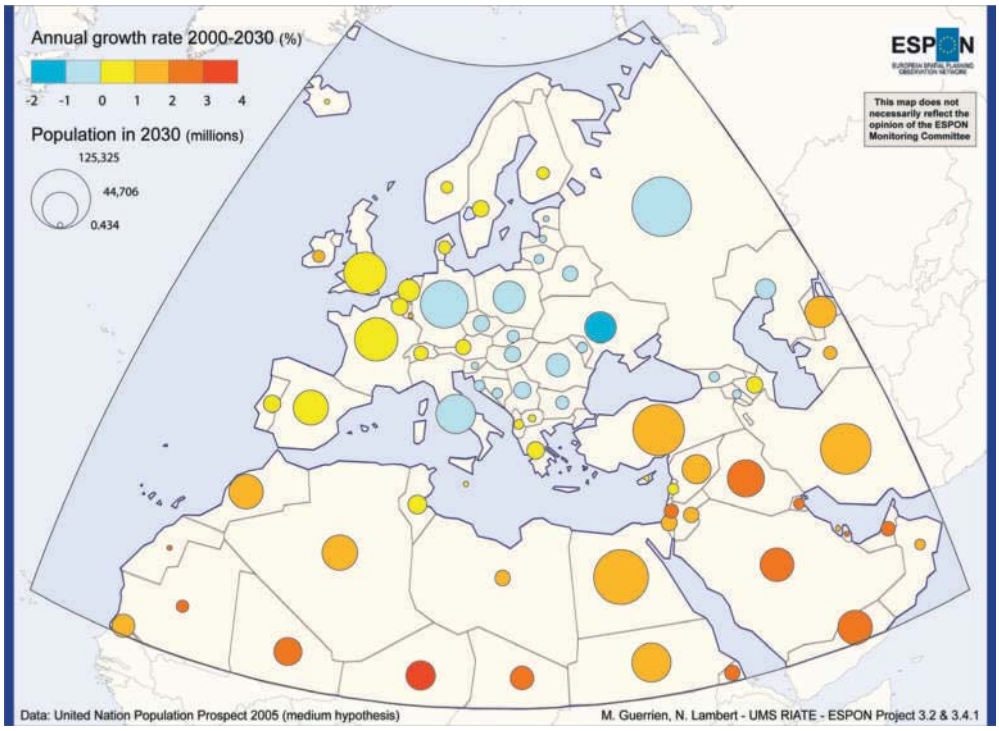
### *The territorial footprint of ageing*

The age of the average European – already among the world's oldest – will continue to increase in the future. This will have significant social and economic impacts. The territorial footprint of population ageing, however, is not uniform. Different regions will face different challenges.

By 2030, most European regions will have reached a median age of over 45 years. In a number of regions, such as Corsica, Sardinia, northern Spain, East Germany, Scotland and central Sweden, this number will be even higher. Depopulation trends will increasingly affect a number of more rural and remote regions. On the other hand, strong demographic potential, that is, a combination of low median age and high life expectancy, will prevail in numerous metropolitan areas, especially in those of north-west Europe. The opportunities for a reduction of unemployment provided by the large number of retirees can only be fully exploited if adequate qualification and integration measures are taken.

- Many peripheral rural regions will have fewer and older residents, leading to labour shortages and changes in the demand for services and infrastructure. They will have to work hard to halt the vicious cycle of decline.
- Some attractive rural areas, especially those along the southern coastlines and their hinterland, are likely to develop into European retirement zones.
- Larger metropolitan areas will remain magnets of population, thus increasing demand for space and the risk of negative agglomeration effects, such as traffic congestion and air pollution.

**Trend Scenario: Population in Europe and neighbourhoods in 2030**




## Europe and its neighbourhood

*The expanding territorial context*

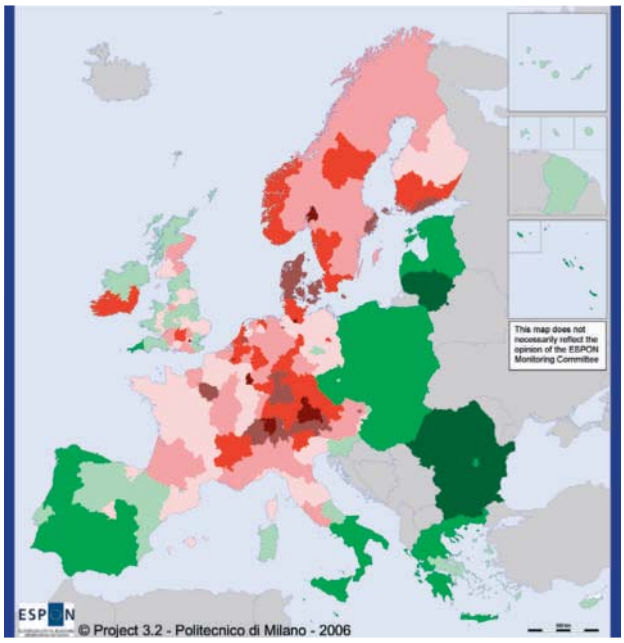
The changing territorial structure of Europe cannot be understood without considering its relationship with the rest of the world and its immediate surroundings. In the period up to 2030, Europe's relative demographic potential will decline as compared to its neighbours. In addition, the economic divide is likely to increase further, leading to increasing external inmigration pressures, mainly from Africa, but also from Asia.

- The effects of family policies aimed to mitigate population ageing and decline are likely to be felt only in the long-term and, thus, the issue of immigration will need to be seriously considered in order to maintain a stable and balanced population in Europe.

- Although the core economic area of Europe (i.e. the 'Pentagon' area between London, Paris, Milan, Munich and Hamburg), will continue to be the most preferred destination, European Mediterranean regions can also expect significant in-migration, just as, increasingly, the twelve countries that joined the EU recently.

- Metropolitan areas are likely to continue to be the most favoured destinations. This will reinforce their current demographic development, and increase the risk of socio-economic and cultural segregation and conflict.

**Trend Scenario: Per capita GDP in 2015**

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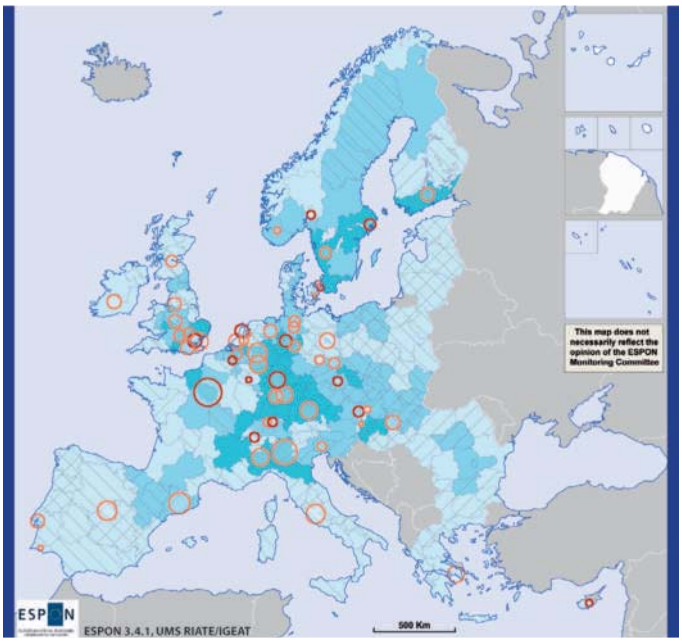
Thousands of Euro at 2000 prices

- 1.329 - 3.609
- 3.609 - 7.059
- 7.059 - 15.676
- 15.676 - 21.456
- 21.456 - 26.509
- 26.509 - 31.614
- 31.614 - 40.246
- 40.246 - 53.669
- 53.669 - 69.875
- No data

Source of data: output of MASST model, 2006
Years of calibration data:1995-2002

*Map based on the MAcroeconomic, Sectoral, Social and Territorial (MASST) forecast model.*

**Factors of sensitivity to globalisation**




Regional level: NUTS2
Source of data: Eurostat and National Statistical Offices
Year of data: 2002

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Regional level: NUTS2

Internationalisation level *(NUTS2 regions with major urban areas)*

- *Low*
- *High*

Total NUTS2 population *(thousands of inhabitants)*

- *10 000*
- *2 500*

Structural strengths and weaknesses

- *High share of technological manufacturing industries*
- *High share of personal services*

Technological level

- *Low*
- *Medium*
- *High*
- *No data*

## Europe and its products: Economic evolution

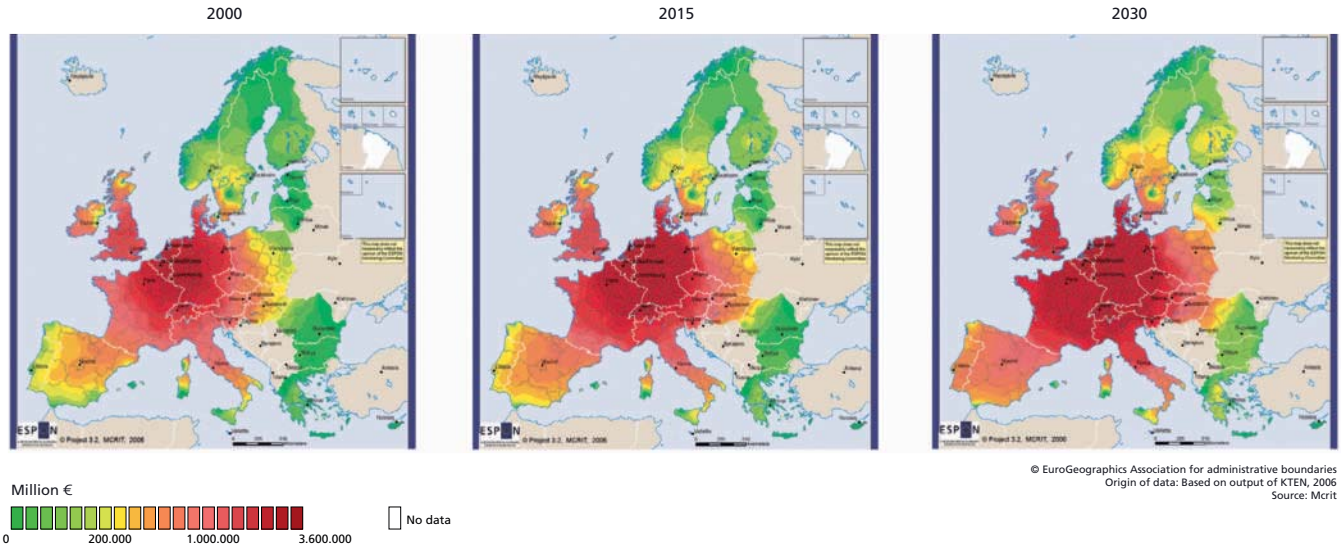
### *Regional economic disparities*

The enlargement of the European Union fundamentally changed the scale of economic disparities within the EU.

When joining, many regions in the new member states had GDP per capita (PPS) levels well below half the EU average. Most of these regions will undergo a catching-up process until about 2015, but their evolution after that will be more differentiated. Recent evidence seems to suggest that the future pattern of growth will accentuate the contrast between metropolitan and non-metropolitan areas. Europe as a whole will progress towards a knowledge and service economy, while large segments of manufacturing activities based on low and medium-level technologies will be relocated outside Europe or abandoned altogether. Still, most of Europe's production and exchange remains intra-European, making internal demand of great importance for European economic growth. Generally, it is the metropolitan regions that will benefit the most from the globalisation process and from the related restructuring of the economy.

- The knowledge and service economy is largely based on direct contacts. This favours metropolitan regions where international high-level financial and business services are located.
- New technologies offer potentials for economic development in non-metropolitan areas, but accessibility remains a key factor for the exploitation of these potentials.
- Regions highly dependent on low and medium technology level exports are the most vulnerable to global competition.
- Some eastern European regions may need a long time before they come close to EU average levels of GDP per capita.

**Trend Scenario: Total GDP accessible at less than 10 hours**




*Map based on the Know trans-European Networks (KTEN) freight and passenger transport forecast model.*

### *Mobility and accessibility*

Areas with good pan-European accessibility will spread from the central Pentagon area in almost all directions. However, disparities in accessibility between central and more peripheral areas will remain significant, especially regarding freight transport, and even more in terms of regional or local accessibility. For some regions, improving accessibility will remain top priority. Higher oil prices are likely to influence travel behaviour to a certain extent, with residential locations well-serviced by public transportation likely to gain in popularity. The increasing number of retirees may generate forms of mobility very different from the classical home-work commute. These are more linked to recreation and leisure, cultural activities, family visits and health care.

- In some peripheral areas of the member states that recently joined the EU, major efforts are needed to reach European standards of regional accessibility.
- Higher energy prices will be most disadvantageous for peripheral and rural regions.
- Mobility patterns will become more differentiated, and, unless energy prices increase significantly, mobility is likely to increase.
- In spite of technological advancements, air pollution and CO2 emission levels are likely to remain unsatisfactorily high and will thus continue to contribute to accelerating climate change.

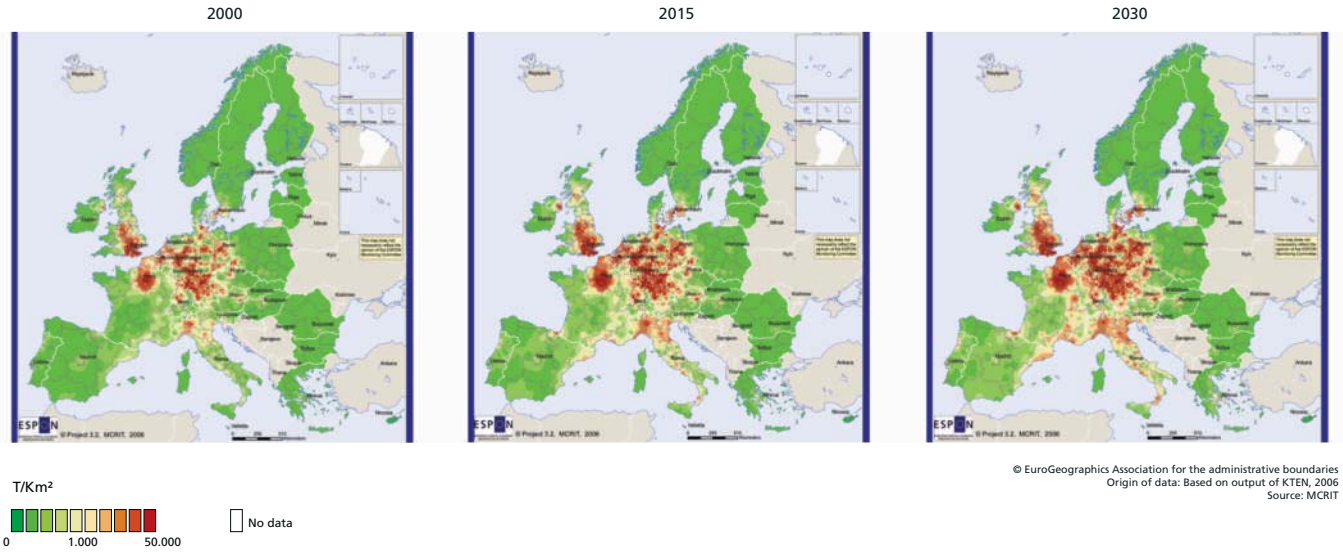
## Europe and its resources: A new energy paradigm and climate change

### *Territorial effects of a changing energy paradigm*

Increasing global demand for energy, combined with declining supply due to oil and gas peaking is likely to lead to a paradigm shift in global energy production and consumption. A reshaping of energy systems will have significant, and spatially differentiated, impacts. A number of rural areas will probably move towards the production of energy crops, both in Western and Eastern Europe. Although solar and wind energy, tidal and wave hydropower could benefit various types of regions, the potential for renewable energy can only be tapped through important investments, which is more difficult for poorer regions. A revival of nuclear energy in a number of countries could be seen as an alternative. On the consumption side, numerous and significant investments will probably be carried out to save energy, both at home and in the workplace. Some energy intensive industries may relocate outside Europe.

- Only major investments in alternative energy sources can counter the probable effects of oil peaking.
- Renewable energies provide opportunities for a territorially decentralised and more autonomous regional energy production.
- Biomass production could become an important source of revenue, also in peripheral areas.
- Where there is lack of sufficient alternative sources, declining supply might lead to significant changes in energy consumption patterns, including mobility. This will work to the disadvantage of peripheral regions.

**Trend Scenario: CO2 emissions per surface due to inter-urban road traffic**




*Map based on the Know trans-European Networks (KTEN) freight and passenger transport forecast model.*

### *Territorial impacts of climate change*

Europe is likely to experience an increase in natural hazards (floods, droughts and heat waves) and shifting climate zones in the coming decades. Floods will cause increasingly more damage, especially where no prevention measures are taken. Drought will most likely lead to the abandonment of dry-land agriculture in large areas of Southern Europe. Inter-regional tensions over water resources will probably emerge as well. On the other hand, northern European regions may experience more favourable conditions.

- **Southern Europe will be particularly exposed to climate change and related hazards. In some regions, water shortages and forest fires will threaten landscapes and harm productivity.**
- **The winter tourist potential in a number of mountain areas is likely to decrease significantly.**
- **Due to more favourable climatic conditions, some parts of northern Europe will see new opportunities for agricultural production and tourism.**

## Europe's cities and rural areas: Evolving spatial structures

### *Metropolitan areas and cities*

The main metropolitan areas seem well-set to strengthen their leading position in Europe. The core economic area, the Pentagon, is likely to expand towards the British Midlands, the southern regions of the Nordic countries, the Rhone valley and the Danube valley. A number of city networks will probably emerge inside and outside the central Pentagon, for instance in the Baltic Sea Region and in the Triangle formed by Vienna, Warsaw and Budapest, however without reaching the level of global significance of the Pentagon.

The capital cities of various central, eastern and southern Europe will tend to become more dominant in their national urban systems. Insufficient socio-economic integration may increase segregation and social conflict in urban areas. Although high oil prices tend to favour the development of more compact cities, this will be offset somewhat by increasing housing prices.

### *Rural areas*

Rural Europe will most probably increase its internal differentiation. Some rural areas are likely to gain substantial population densities and economic diversification, linked to their proximity to large towns or their attractiveness for residential and tourist functions. These are spread throughout Europe in the surroundings of metropolitan areas, in attractive coastal areas and valleys and in Mediterranean regions with a favourable climate.

At the other extreme, a significant number of remote, less fertile rural areas could be more or less abandoned. Various intermediate situations can be observed, with some rural areas taking advantage of the development of biomass production to compensate for cuts in the Common Agricultural Policy (CAP). Climate change will be most detrimental in areas subject to drought in the southern part of Europe, and most beneficial to agricultural areas in the north. Climate change will also negatively affect winter tourism in a number of mountain areas.


**Trend Scenario:**
**Spatial structure and urban hierarchy in 2030**

## An image of Europe in 2030: A territorial trend scenario

A simplified image of the European territory, based on the continuation of current trends and policies illustrates the probable result of this "trend" scenario.

The following assumptions regarding autonomous trends and policy decisions were used to produce the trend scenario:

- Total EU population increases only through enlargement
- Increasing, but globally controlled external migration.
- Slowly increasing total activity rate.
- Slowly growing R&D expenditures, but technological gap with the US persists.
- Decreasing public expenditure.
- Steady increase of energy prices.
- Further liberalisation of international trade.
- Progressive reduction of CAP budget.
- Little coherence between policies devoted to innovation and competitiveness and those devoted to cohesion.
- Moderate overall climate change (+1° C) but increased frequency of extreme local events.
- Enlargement: Western Balkans (with Croatia acceding first) by 2020 and Turkey by 2030.

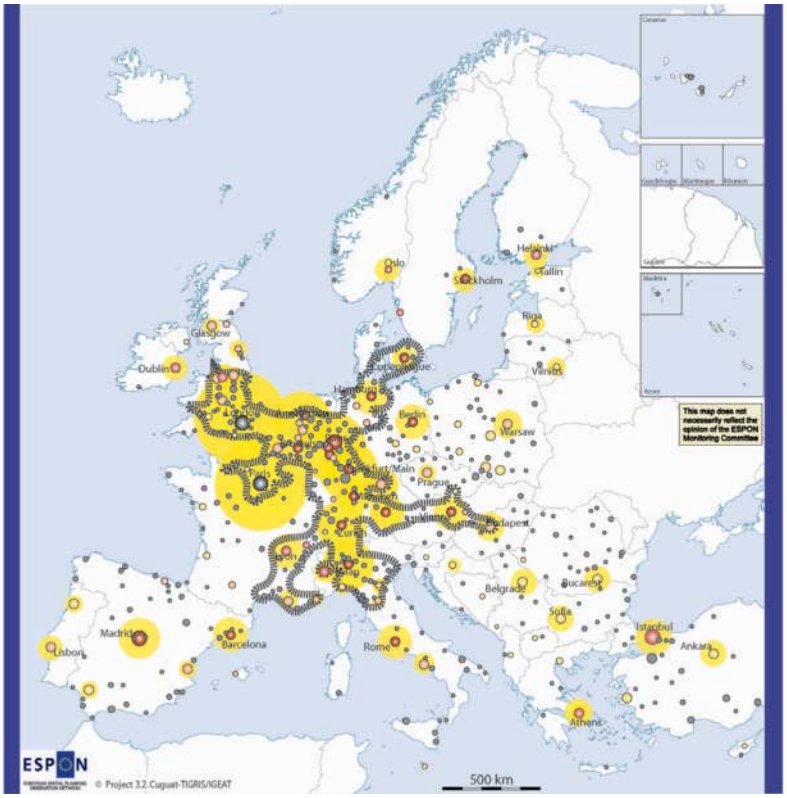
## The territorial outcomes of this scenario can be summarised as follows:

*A remarkable concentration of activity has occurred in the metropolitan areas of the central economic area, the Pentagon, but also in less central regions (mainly capital cities and other European engines). As a result, the Pentagon has extended outwards along main transport corridors in the direction of major metropolitan areas like Barcelona and Madrid, Rome, Glasgow, Copenhagen, Stockholm and Oslo, Berlin and Warsaw, Prague, Vienna and Budapest.*

*At the same time, various areas are at risk of economic decline. The marginalisation of some rural areas has continued unabated. In some areas, the number of available jobs has plummeted. In others, population ageing and even depopulation have reached critical levels. Globalisation has impacted many industrial regions with low or intermediate technologies. The most severely affected areas are located in central and eastern Europe.*

*External immigration has continued, with immigrants settling mainly in large metropolitan areas, including central and eastern European cities. The areas with a high potential for tourism and retirement have specific geographical attributes (coastal, lake and mountain regions), while ageing areas are mainly found in remote rural regions without specific attractiveness. Various regions especially in southern Europe are subject to the impacts of natural hazards, mostly due to climate change.*

# PROBABLE TERRITORIAL IMPACTS OF A COMPETITIVENESS-ORIENTED POLICY SCENARIO




**Competitiveness-oriented Scenario: Spatial structure and urban hierarchy in 2030**

Urban typology:

- Global City
- European Engine
- Strong MEGA
- Potential MEGA
- Weak MEGA
- Regional/Local City

Attraction and polarisation potential of metropolitan area

Area of concentration of flows and activities



## Competitiveness as main driver

In the competitiveness-oriented scenario, most of the autonomous developments (i.e. globalization, climate change) identified in the trend scenario were held constant. The difference lies in the policy response. In this scenario a 'policy mix' is created which is aimed at boosting Europe's competitiveness. This 'policy mix' comprises the following measures.

- Strong reduction of the total EU budget, and a retargeting of funding towards R&D, education, ICT and strategic external accessibility. CAP and ERDF budgets are reduced significantly.
- Focus of EU-policies on regions with strongest potentials.
- Further liberalisation and privatisation of public services.
- Priority given to enlargement.
- Immigration promoted to enlarge labour-force.
- Investments in infrastructure are performed according to market demand.
- Mitigation measures related to climate change are based on flexible schemes, adaptation measures implemented only when cost efficient.
- Environmental measures undertaken only if market-efficient.
- Wider application of the Open Method of Coordination.

## The territorial outcomes of this scenario can be summarised as follows:

*The attraction and polarisation potential of metropolitan areas is particularly strong and activities are concentrated in the traditional Pentagon. Only very few metropolitan areas beyond it are able to generate significant attraction and polarisation effects. The area of concentration of flows and activities is much more limited than it would be following current trends. It covers only parts of the traditional Pentagon, although it also extends out along a few major corridors, to reach Vienna and Copenhagen.*

*The risk of rural marginalisation is much more intense than with current trends. The areas at risk of industrial decline are more numerous and the intensity of risk is also higher.*

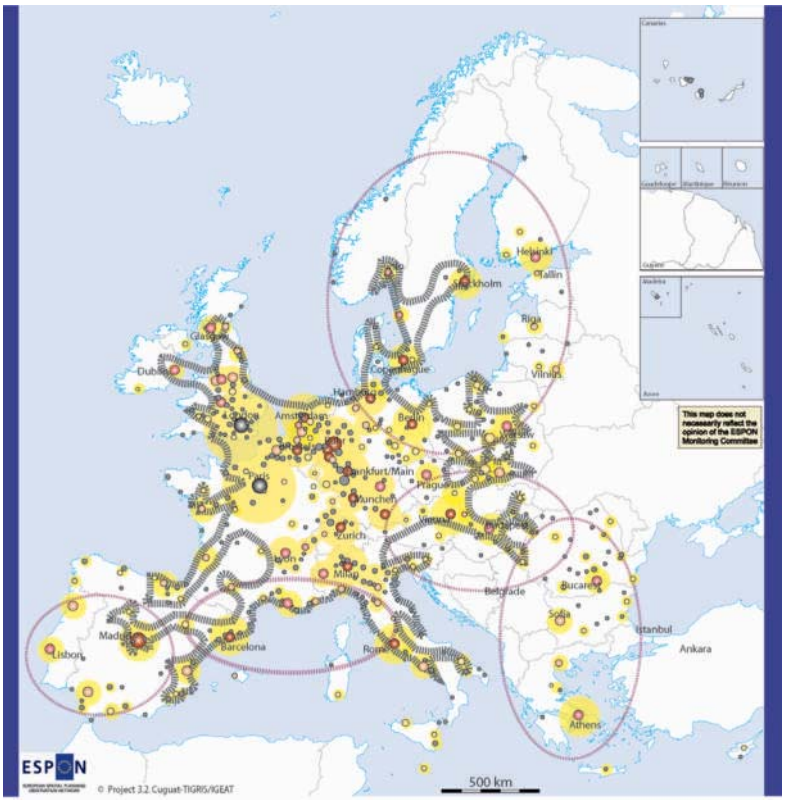
*External immigration flows are particularly intense. The areas with high potential for tourism and retirement are similar to current trends, but the areas with severe population ageing, generally in remote rural regions, are more extended. Impacts of natural hazards (drought, fires, and floods) are more intense than expected by current trends.*

## Contrast to the trend scenario

In the competitiveness-oriented scenario, the change in policy mix has produced the following effects with respect to the trend scenario:

- Lower median age in general.
- Higher economic growth, but more concentrated in territorial terms.
- Greater socio-economic polarisation, spatial segregation and conflict in the population.
- Regions with metropolitan areas clearly favoured by demographic and economic growth.
- Significant suburbanisation.
- Disadvantaged rural areas more seriously affected.
- Higher emissions levels.

# PROBABLE TERRITORIAL IMPACTS OF THE COHESION-ORIENTED POLICY SCENARIO




**Cohesion-oriented Scenario:**
**Spatial structure and urban hierarchy in 2030**

## Cohesion as main driver

In the competitiveness-oriented scenario, most of the autonomous developments (i.e. globalization, climate change) identified in the trend scenario were held constant. The difference lies in the policy response. In the cohesion-oriented scenario, a 'policy mix' is created which is aimed at improving cohesion in Europe. This 'policy mix' comprises the following measures.

- Maintaining the volume of the EU budget, reinforcement of the Structural Funds.
- Concentration of European policies on the weakest regions.
- More public intervention and more decentralised and coherent governance.
- No new EU enlargements: priority given to deepening EU cooperation.
- Restrictive policy on external immigration.
- Peripheral regions given priority for infrastructure investments.
- Promotion of decentralised energy production, particularly renewables.
- Strict climate change mitigation measures, wide range of adaptation measures.
- Strict environmental measures.
- Active multi-level territorial governance in areas supported by the Structural Funds.

## The territorial outcomes of this scenario can be summarised as follows:

*The image of the European main territorial structure reveals a more diffused pattern as far as the attraction and polarisation potentials of metropolitan areas are concerned. Urban settlements are characterized by greater polycentricity, stretching over larger swathes of the European territory than in the trend scenario.*

*In contrast to the trend scenario, several well-performing integrated zones have emerged outside the Pentagon, also in more peripheral areas. The Pentagon has grown and includes a larger number of cities outside this area.*

*The number of areas at risk of marginalization and of declining activities is comparable to the trend scenario, but their size is reduced and intensity lower. The areas with high potential for tourism and retirement as well as those with severe population ageing remain similar.*

*The impacts of natural hazards (drought, fires, and floods) are much lower than expected with respect to the current trends.*

## Contrast to the trend scenario

In the cohesion-oriented scenario, the change in policy mix has produced the following effects with respect to the trend scenario:

- More regionally balanced population structure.
- Lower total economic growth, but better distributed geographically.
- Lower global competitiveness of European metropolitan areas.
- More favourable evolution of non-metropolitan regions, including mid-sized towns.
- More widespread progress in accessibility.
- Less pronounced socio-economic polarisation and segregation in cities.
- Better integration of disadvantaged population groups into the labour market.
- Lower emissions levels in general.
- Rural areas generally more prosperous through economic diversification.
- Climate change has less damaging effects.
- More protection of natural and cultural heritage.

# COMPARING SCENARIOS

## The use of spatial scenarios

The value of scenarios for policymakers becomes particularly clear when comparing them. The spatial scenarios elaborated above should be used to inspire future policy processes.
The trend scenario shows that basically unchanged policies will not be a sufficient response to the emerging challenges. A number of socio-economic and territorial shortcomings may emerge, which will require additional policy action. This should include:

- Implementing a Lisbon Strategy targeting the diversity of territorial potentials in European regions.
- Promoting necessary investments in education and research and increasing social, economic and territorial cohesion.
- Responding to the diverse territorial impacts of climate change.
- Strengthening family and integration policies.
- Increasing the integration of the European economy.
- Targeting support to areas in need of improved access and infrastructure, avoiding investments with low profitability and less appropriate with regard to the new energy paradigm.

The spatial scenarios reveal some interesting effects of the 'policy mix' implemented:

The competitiveness-oriented policy mix is more likely to generate stronger economic growth and the emergence of new technologies. It will also produce higher environmental and social costs related to growing disparities at various scales, and is likely to result in economic and social drawbacks as well as in territorial imbalances with enhanced differences in living conditions and polarisation between areas.

The cohesion-oriented policy mix is more likely to produce a significant amount of added value in terms of reduction of territorial imbalances, greater demographic revival, socio-cultural integration, lower damages related to natural hazards, and less negative impacts on rural regions, but its economic and technological performance will probably be lower than that of the two other scenarios.

## Options for policy responses addressing emerging territorial challenges

The development of the European territory demands real choices to be made by society, and poses significant challenges for the European policy process.

In order to address these challenges and ensure a sustainable long-term development of the European territory, policymakers at all levels should consider options to support the aims of the European Union in developing a more balanced and harmonious territory to the benefit of the citizens of Europe, including:

- A stronger integration of territorial objectives in a comprehensive European policy system that can provide support from a variety of relevant public policies (innovation, R&D, transport, agriculture and education, etc.).
- An awareness and governance system supporting all levels of policymaking (EU, national, regional, local) working towards a shared territorial agenda.
- A clear integration of new territorial challenges (e.g. climate change, population ageing and decline, globalisation, the new energy paradigm) and their probable economic, social and ecological impacts on different types of regions in Europe.

Detailed information about the spatial scenarios is available in a printed executive summary of the report written by the ESPON project 3.2 research team. Policymakers from all EU member states present in the ESPON Monitoring Committee have provided valuable comments and input in the development of the spatial scenarios.