

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

Second Interim Report
 March 2005

Part 1

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| Part 1 |
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Glossary

| | |
|-------------------|---|
| AMECO Database | Annual macro-economic Database |
| AON (Assignment) | All-Or-Nothing (Assignment) |
| CAP | Common Agricultural Policy |
| CEECs | Central and Eastern European Countries |
| CORINE | Co-ordination on Information of the Environment |
| EAGGF | European Agricultural Guidance and Guarantee Fund |
| EEA | European Environment Agency |
| ESDP | European Spatial Development Perspective |
| ETCI | European Territorial Cohesion Index |
| FUA | Functional Urban Area |
| GU | Geographical Unit |
| HDI | Human Development index |
| INTERREG | Community initiative concerning border development, cross-border cooperation and selected energy networks |
| ISPA | Instrument for Structural Policies for Pre-Accession |
| JRC | Joint Research Centre |
| K+C tool | Knowledge and Communication tool |
| KTEN | Know trans-European Networks |
| MASST (model) | Macroeconomic, Sectoral, Social and Territorial (model) |
| MAUP | Modifiable Area Unit Problem |
| NEC Directive | Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants |
| NIS | New Independent States |
| NUTS | Nomenclature of territorial units for statistics |
| NWMA | North Western Metropolitan Area |
| PHARE | The Phare programme is one of the three pre-accession instruments financed by the European Union to assist the applicant countries of Central and Eastern Europe in their preparations for joining the European Union |
| RDP | Rural Development Policy |
| SAPARD | Special Accession Programme for Agriculture and Rural Development |
| SPESP | Study Programme on European Spatial Planning |
| STU | Spatio-Temporal Unit |
| SWOT | Strengths Weaknesses Opportunities and Threats |
| TENs | Trans European Networks |
| UTS | Unions Territorial Strategies |

Part 1: Summary

Introduction

This second interim report is the first report presenting real results of the project as the first interim report mainly provided an overview on methodological issues and a clearer vision of the tasks ahead. This report therefore plays a special role in that it is sufficiently advanced in the process to allow a critical reading of the project's advancement and sufficiently early to make discussion of these results and of the foreseen next phases still worth-while, allowing for possible readjustments.

The main objective of project 3.2, 'Spatial Scenarios and Orientations in Relation to the ESDP and Cohesion', is the development of future visions of the development of the territories making up the ESPON space, i.e. EU27+2. These future visions will take different forms from basic quantitative trends scenarios to qualitative normative, roll-back scenarios.

This report presents the first round of draft thematic scenarios on a wide range of issues relevant for spatial planning and territorial development. These thematic scenarios can stand on their own as awareness-raising and policy exploration tools but will also serve as foundation to the more integrated and multi-thematic scenarios to be developed in the next phase of work.

Parallel to the elaboration of these scenarios, work has progressed on the tools the team proposes to use in conjunction with the scenario building exercise. These include the MASST macro-economic regional development model, the KTEN transport meta-modeller, measurements of elements of territorial cohesion and the long-term database structure.

But this project has a double role: next to the elaboration of future visions it also has to support the ESPON Coordination Unit in the scientific coordination of the entire ESPON programme. Although these two objectives overlap to a certain extent, as the scenarios integrate as much as possible all available ESPON results, they do present two different focus points for the project team. The scientific coordination was taken over by the project in October and the results of the work so far are summarised mainly in the Nijmegen Guidance Paper which is to be considered as part of the present report.

Several issues should be mentioned in connection with the organisation of work, both within the TPG and in the general framework of the ESPON programme:

- It has taken the team quite some time to understand the exact role desired by the Monitoring Committee within the process of scenario building and to adapt accordingly. The Nijmegen brainstorming session with the MC in October 2004 has finally allowed to clarify these issues and to get the TPG on the right track.
- The initial division of tasks within the TPG as presented in the tender proved inefficient. It was, therefore, decided to organise the team according to scenario themes, instead of dividing it up into work packages dealing with driving forces, policy impacts, etc separately. This does not change anything in terms of the outputs, but has allowed a much speedier advancement in terms of the elaboration of actual scenarios.

- Since the beginning of the contract several new ESPON projects have taken over some of the work which was initially foreseen within 3.2 in order to fill the holes in the existing information. This is notably the case with project 2.4.2 which will provide an analysis of specific territories as well as a selection of analytical indicators, and projects 3.3 and 3.4.2 which analyse issues of regional economics not covered by any of the previous projects. Care will, therefore, have to be taken not to create duplicate efforts. As a result 3.2 should be able to focus more on some of its key tasks while keeping in close contact with the other teams.

How to read this report

The report is divided into three parts:

a) **Part 1** (the one you are holding in your hands or visioning on your screen) which is a policy-oriented executive summary part

You should start here. It gives a summary of the draft scenarios and of the tools developed in parallel. It also allows to see the links between the different elements as well as an overview of the most important policy-relevant results that have come out so far.

b) **Part 2** containing all the thematic scenario bases and scenarios

For each theme a team has worked out a scenario base, summarising the necessary information for elaborating coherent and relevant scenarios. This information partly comes from existing ESPON reports, but, as these have proven largely insufficient to supply the necessary information for scenarios, mostly external sources have been used. For each theme two to four scenarios have been elaborated exploring possible shifts in trends or policy.

c) **Part 3** containing all the auxiliary tools and tasks developed by the TPG

As the current ESPON programme could not deliver all the foundations necessary to build scenarios, and since the aim of project 3.2 is also to prepare future prospective research in European spatial planning, it was decided to elaborate several tools which will support scenario elaboration and whose state of advancement is described here. In addition, this part also contains the information concerning the teams communication strategy for the dissemination and discussion of the scenarios, the overall scientific coordination of ESPON and a summary of the next steps in the project.

Each of these parts can be read independently of each other if the reader is looking for specific information on one scenario or one tool. However, the different parts are obviously linked.

Executive summary

Introduction to the report

This report is the first report of project 3.2 delivering concrete results. However, it should be seen as a glimpse of work in progress as none of the results are finalised, yet.

The main aim of the project is to provide policy makers with the necessary tools to understand the potential evolutionary paths that European regions might take and the possible consequences of different spatial policy choices.

The major tool developed and to be developed are scenarios, i.e. future visions of possible, desirable and undesirable developments until 2030. These visions are to be grounded in the general policy questions and options defined by the ESDP. In this report the project team presents its first round of draft thematic prospective scenarios covering the themes of demography, transport, energy, economy, governance, enlargement, rural development, climate change, and socio-cultural issues (Chapter 2 - Scenarios). Even in their current, preliminary state, the scenarios already lead to quite a range of interesting policy options and should, therefore, once they have reached their final version, be of immediate use for policy makers in the fields of territorial development and spatial planning, but also more generally within any policy field that has possible spatial impacts (Chapter 1 - First ideas and policy recommendations). The team has, therefore, developed a communication strategy which should allow wide-spread dissemination and debate on these scenarios (Chapter 4 - Proposal of a communication strategy...).

Other tools are also being developed, however, in conjunction with and in complement of the actual scenarios. These tools include a regional econometric model which will allow the simulation of economic growth according to a wide range of hypotheses (section 3.1.1 MASST), a meta-modelling system currently applied to transport (including freight) and which allows policy-makers to easily play with different policy options in a transparent way (section 3.1.2 KTEN), research into the possibility of creating a European Territorial Cohesion Index which would allow to test scenarios according to the impact of possible evolutions on territorial cohesion in Europe (section 3.1.3 ETCI), and a long-term database which should lay the foundation to a sustainable management of data across varying spatial units and across time (section 3.2 LTDB). All these tools will be directly used in the scenario building process of the current project, but will also be useful tools in future exercises of policy-relevant trends analysis in the ESPON framework.

Next to the scenario building and the related development of tools, project 3.2 also has the task of supporting the scientific coordination of the entire ESPON programme and of maintaining and enhancing the ESPON common scientific platform. This effort overlaps with the two preceding tasks, but only partly and substantial work is going into several elements of coordination such as the maintenance of the ESPON Database and Map Kit (Section 5.2 ESPON data base), the continuing guidance of projects in their complete life cycle and concerning common elements of research (section 5.1 Nijmegen Guidance Paper), the preparation and implementation of seminars and the overall external communication of the ESPON programme. All this is happening in close collaboration with the ESPON Coordination Unit and through regular discussions with the Monitoring Committee.

Scenarios (see Part 2)

Solid scenarios need a solid scenario information base, i.e. a thorough overview of the existing knowledge concerning trends and driving forces in the thematic field(s) to be covered by the scenario. The terms of reference for project 3.2 stated that 'basically make use of results and data sets elaborated by the ongoing ESPON projects, and not preview substantial new data collection or maps on trends and policy impacts within the project.' This has proven to be a somewhat naive vision of what the other ESPON projects could deliver in relation to the needs of scenarios. None of the other projects having been conceived in the perspective of scenario building, and all of them were limited by too short time schedules and scarce resources to provide the in-depth long-term analyses necessary for the elaboration of vision reaching as far as 2030. This means that although some of the project reports have offered some interesting insights all the teams working directly on the scenarios had to make a substantial effort in finding information elsewhere. This should be kept in mind while reading the resulting scenarios.

The draft scenarios present in this report are of the prospective kind, i.e. roll-forward, future-oriented scenarios that explore either significant changes occurring in the behaviour and actions of actors (individuals, households and business) without new policy intervention (prospective) or changes occurring mainly in one or more areas of public policies (prospective policy). A few of them are closer to baseline scenarios, essentially projecting current trends into the future. However, none of the scenarios should be seen as straightforward predictions. On the contrary, the team, in accordance with the ESPON Monitoring Committee, has deliberately chosen to push the scenario hypotheses to a certain extreme in order to give the scenarios a pedagogical character, the main aim of the exercise being awareness raising.

All of the scenarios are qualitative and essentially text-based. They contain a story line which allows the reader to follow the flow of events from 2005 to 2030 and they identify the major driving forces and impacts, global and territorial. However, at the current stage the territorialisation (or spatialisation) of the scenarios is at a very early stage as it was deemed important to first develop a clear vision of the general trends for the European space as a whole before going into a more differentiated exploration of different types of regions. Territorialisation will, therefore, be the main task in the next phase until mid-2005.

After that, the team will integrate the individual thematic scenarios into multi-thematic scenarios and will begin the elaboration of proactive (roll-back) scenarios which explore if and how future territorial situations (images) might or might not grow out of the present, what might be achieved or avoided, given available constraints, resources and technologies (strategies of private and public actors being fairly free).

Demography (see Section 2.1)

- **Key trends and driving forces**

The main trend in fertility across Europe is convergence in decline, though in Southern Europe the decline is of more recent origin and in Eastern Europe the decline has been sharpest. The same can be said for mortality, with EU countries making the most marked improvements responsible for most of the convergence. However in the case of mortality Eastern European countries, particularly those outside the EU have not experienced a reduction in death rates to the same degree and in some cases death rates have worsened since the early Nineties. Migration has, in contrast to fertility and mortality been rising

across the EU. Although its impact has been variable, population levels have increasingly depended on immigration.

Regional population trends have been characterised variously as centre/periphery, East/West and by 'region type'. The main developments in the former two models have been a move from the peripheral areas to central, economically strong zones which have left areas of de-population and movement generally, of younger workers, from East to West. Six 'region types' were established by the research of ESPON project 1.1.4 and they are presented, with the combination of factors making up their type being a mixture of migration and natural population change.

Explanations for the decline in fertility and mortality cluster predominantly around health and lifestyle factors. In the case of fertility economic and employment factors are also important, particularly for women. With regard to migration there are push factors explaining the desire to leave countries of origin and pull factors accounting for the varying attraction of different member states. These clearly are complex and studies demonstrate that there are a lot of country specific factors that explain migration trends.

With respect to policy recommendations, ESPON 1.1.4 found a lack of clear policy direction at the EU level. Recent work from the Employment and Social Affairs Commission on the challenges of an ageing population indicates a possible move to a clearer position in the future. The issue of harmonising EU approaches to immigration, and its role in employment replacement, is also firmly on the agenda.

- **Scenario 1: 'The Silver Century'**

This scenario is based on the continuation of current trends, both in terms of demographic evolutions and in terms of policy. The European population will continue to age and immigration will be very limited and controlled. The shrinking workforce will have to support the rising costs of health care and pensions for the growing number of older people. The fiscal demands of this 'ageing Europe' place tremendous stress on the 'European social model' of welfare provision which is based on a choice made to accept lower economic growth in return for more social protection and leisure time. Older people move to Southern 'retirement destinations' and to rural areas, where they use their 'grey' voting power to shift public spending away from nurseries, schools and playgrounds towards health care and retirement homes. Core-periphery and the east-west demographic polarisation further accentuates as a result of depopulation and loss of labour force.

- **Scenario 2: 'Open border'**

In order to counterbalance the trend toward population ageing and decrease in labour force, immigration from outside Europe is encouraged by developing a new demographic policy of the European Union. This policy actively supports the arrival of immigrants, legalizes illegal presence and tries to encourage integration models.

The implication of the policy profoundly touches the demographic structure of most of the member countries, the labour market and the social insurance systems. But immigration also touches the social, cultural and political life of Europe as well as the interrelations of Europe and the main regions of immigration.

The integration of some 150 millions of new immigrants causes quite severe problems, especially in metropolitan areas, where social segregation and differentiation by origin become quite important. Nevertheless, the fact that new immigrants from different origins do not concentrate in distinct quarters and that both integration in national context as well as in English is possible, avoids too strong conflicts. Open border policy has also been accompanied by a re-increasing role of social welfare state in the domains of housing, social integration and health sector.

The strongest preoccupation of the migration process has been the strong spatial effects of these important population movements. On the larger scale, we observe some countries and regions with very limited immigration from abroad and some strong concentration on big metropolis. On the local scale, migration conducted to social and spatial segregation, even if this processes did not have been as important as they have been in North American metropolises around the turn of the century.

Transport (see Section 2.2)

- **Key trends and driving forces**

For passenger transport, the determining factor is the spectacular growth in car use. The number of cars has tripled in the last 30 years, at an increase of 3 million cars each year. By the year 2010, the enlarged Union will see its car fleet increase substantially.

Growth in goods transport is due to a large extent to changes in the European economy and its system of production. In the last 20 years, we have moved from a 'stock' economy to a 'flow' economy. This phenomenon has been emphasised by the relocation of some industries which are trying to reduce production costs, even though the production site is hundreds or even thousands of kilometres away from the final assembly plant or away from end-users.

In the case of air transport, the main factors of traffic development are the recent liberalisation as well as the related development of low-cost companies.

Saturation on some major routes is partly the result of delays in completing trans-European network infrastructure as well as the poor organisation of Europe's transport system and failure to make optimum use of different means of transport and new technologies. Here, one factor is the insufficient competitiveness of alternative transport modes, such as railways, waterways and maritime transport. This is also linked to the fact that the price structure generally fails to reflect all the costs of infrastructure, congestion, environmental damage and accidents.

Because of market-driven development of infrastructure, delay in providing infrastructure in outlying areas and enclaves where there is too little traffic to make new infrastructure viable means that these regions cannot be properly linked in. This is often combined with low level of intermodality and of adapted transport services in the more remote regions.

- **Scenario 1: 'More investments in motorways'**

The scenario is based on the hypothesis that EU and national policies make maximum use of the existing capacities of road transport infrastructure and expand it, considering that modal split towards rail and maritime transport has not really been successful and that there is a

clear trend in favour of road transportation in general, and in the new member states in particular. An ambitious motorway investments strategy is adopted in order to reduce and prevent congestion on the main European networks. Specific financial engineering based on public-private partnerships was developed. Considered from a Europe-wide perspective, the strategy favours in the long range the development of more peripheral regions and therefore polycentricity. At lower levels, a significant reduction of traffic congestion can be observed, in particular in highly urbanised regions, accompanied however by a significant progress of suburbanisation. The impacts of the strategy on the environment are far from positive, with a strong increase in greenhouse gas emissions and with significant damages to natural areas.

- **Scenario 2: 'Decoupling economic development from the mobility of people and goods'**

The scenario is based on a combined strategy which aims on the one hand at enforcing the provisions of the Kyoto Agreement and of the Göteborg Strategy (reduction of greenhouse gas emissions and further environmental protection) and on the other hand at moving the European economy towards more knowledge-based components according to the Lisbon Strategy. Policy measures are taken at all levels to discourage the use of cars and trucks, both for long-distance and for regional and local transportation of people and goods and to reduce air transport on short distances. Specific policy measures encourage and promote alternative transport modes with lower environmental footprint. The transport strategy is accompanied by measures of economic policy likely to favour the knowledge-based economy and to develop more immaterial economic functions. The implementation of the strategy shows negative macro-economic impacts in the short-term (increase of transport costs), but high competitiveness in the long-term. At Europe-wide scale, the regions most advantaged are those easily accessible by long-distance efficient railways, high-speed trains, waterways and maritime transport. These are mainly regions with large metropolitan areas within the Pentagon, but also outside of it. The regions most disfavoured are those whose national and European accessibility is largely dependent upon road and air transport, numerous peripheral regions belonging to this category. At meso-level, regions with dense railway networks or important commercial ports are favoured. At more local level, the evolution is in favour of compact cities, suburbanisation trends slowing down. The new transport and economic policies are highly beneficial to the environment and quality of life, in particular in the long range.

Energy (see Section 2.3)

- **Key trends and driving forces**

The main driving force leading to a sharp increase in world energy prices is the emergence of a strong imbalance between energy supply and demand at world scale. A logical consequence of this is the increase of energy price as is already obvious in the oil sector. Gas prices, which are indexed on oil prices, are progressively following the trend. Through substitution effects, other energy sources are also likely to become more expensive. The imbalance is caused by the cumulative impact of various factors.

On the demand side:

The main factor of increase is the strong economic development of large emerging industrial countries, such as China, India, Brazil etc and insufficient energy savings in large industrialised countries. Demand for conventional primary energy sources is rising (oil and gas in particular). In the EU, this means an increase in imported energy and therefore an increase in external dependency as well as a greater exposure to the globalisation of the energy markets. Within the EU, the transport and tertiary sectors are largely responsible for the increase in energy demand. The EU enlargement is likely to generate more intense transport flows and therefore higher energy demand.

On the supply side:

In the short/medium term, the main factors of restriction are war and terrorism (Middle East, Nigeria), the policy of production monopolies (OPEC), economic troubles (Russia) etc. In the longer term (after the mid 2010s) oil production is likely to peak for technical reasons and to cause a disastrous disruption between oil supply and demand. Prospects for a significantly stronger contribution of renewables in the coming decade are not encouraging, mainly because of the amount of investments necessary. New technologies are presently being developed in the field of energy production, but they will generally need considerable time to become mature and operational (nuclear fusion for instance). Hydrogen is an energy vector and not a source of primary energy. Significant amounts of electricity are necessary to produce hydrogen.

Within the EU, energy market opening has been associated with a decrease in energy prices either for households or for industry. Most of the EU energy policy measures will impact territorial development through energy price variations.

● **Scenario: 'Europe in a context of high energy prices'**

The evolution of energy price (in particular oil) over the past year indicates that there is a significant change in trends and that high energy prices will have in future a sustainable character. The prospective scenario aims at investigating the macro-economic and territorial impacts of the new trend, taking as assumptions that oil price (and prices of other primary energy sources through substitution effects) will continue to grow more or less regularly and substantially until the mid 2010s and that oil production at world scale will peak before 2020 (in our scenario around 2015) because of geological constraints, generating a complete disruption of balance between supply and demand of energy. While the first period is characterised by further concentration of population and activities in the Pentagon at the expense of peripheral areas, the second period is much more chaotic. It will be characterised by a reversal in the globalisation process, by the reorganisation of economy and society at meso-scale (regional/interregional), by very high unemployment rates leading to migration towards the rural areas. The scenario illustrates how a single economic factor with strategic character such as energy is likely to lead to dramatic changes in the territorial organisation of Europe.

Economy (see Section 2.4)

N.B. This theme is such a complex theme that the scenario base is substantially longer than that of the other themes. In addition, the scenarios presented contain links to quite a variety of themes and give, therefore, a glimpse of what the integrated scenarios to be built after mid-2005 will look like.

- **Key trends and driving forces**

From 1973 to 1998, West European GDP grew at 2.1% a year, compared with 4.8 in the golden age. The deceleration had three components: a) a slowdown in population growth, due to a significant and general fall in birth rates; b) very large rises in unemployment and other dimensions of labour slack; c) deceleration in labour productivity which grew at 2.3% a year compared with 4.8% in the preceding quarter of century. In the course of the 1970s, the objectives of full employment and rapid economic growth were jettisoned, and major emphasis switched to achieving price stability. The persistence of deflationary policies in the 1990s in face of high unemployment and low inflation was due in a large measure to a new objective of policy – monetary union.

Since 1990, Eastern Europe has experienced major problems in the transition to capitalist market economy. Average per capita income in 1998 was more or less the same as in 1989. However, there were big differences in the success of transition among the different Eastern European countries. Given the fact that average per capita income in Eastern Europe is about 40% of that of Western Europe, there should have been scope for some degree of catch-up. However, the problems of transition are very profound. The freeing up of prices and the opening of trade with the West happened relatively quickly. This ended shortage and queuing, improved the quality of goods available and increased consumer welfare in ways not properly captured in GDP measures. However, much of the old capital stock became worthless, the labour force needed to acquire new skills, the legal and administrative system and the tax/social benefit structure had to be transformed and the distributive and banking structure had to be rebuilt from scratch.

The regional economic typology of Europe still confirms a centre-periphery pattern. Recent geographical and structural developments show a continuous displacement of the centre of gravity of the European economy towards the South. But the fast growth of the periphery and the formation of new industrial regions that prevailed during the Fordist era are now being replaced by more complex spatial and structural changes, characterised by tertiarisation, metropolisation and recentralisation processes. Based on the level of economic development and on the type of economic structure (Western) European regions can be grouped in three main types: central areas, peripheral areas and intermediary areas. These large categories can be subdivided into subgroups.

Today, innovation at the frontier is the main engine of growth. In this respect, Europe lags behind the United States for several reasons, including lower levels of total spending on education and R&D, lack of necessary infrastructure (especially in the New Member States), lack of risk capital, a complex regulatory environment and high costs of labour. To a large extent the impact of the knowledge society does not result from few high tech sectors, but more from the use of the advanced technologies, developed in the leading high tech-branches, in all sectors of the economy. ICT and other advanced technologies will undergo a broad cross-sectoral diffusion process. However, this diffusion will require the combination of investments, e.g. in ICT, with fundamental organizational changes. The structural change, induced by the knowledge society, requires high and permanently renewing skills of the workforce.

Even though the EU does not have its own dedicated economic policy (except for the framework defined by the Lisbon agenda), several sectoral policies have a strong influence on regional economic development. Competition policy seeks to guarantee fair and open competition by abolishing protectionism and monopolies (both public and private) and by establishing a 'level playing field' for market players. It contains anti-trust regulations, control of State Aid, and liberalisation of economic sectors. Globally, these policies reduce

the ability of national and regional governments to intervene in regional economic development, except where this is done in the context of regional development. R&D policy, mainly represented by the Framework Programmes, shows its effects most strongly in the wealthy core regions of the EU, where R&D activity is concentrated, although some catch-up can be observed. Finally, the actual effects of regional policy are highly disputed. Whereas regional policy in the New Member States would include major contributions to physical projects such as infrastructure development, we can expect that the effects in the EU15 will be softer, such as improved networks produced by EU incentives for cooperation.

Four general and global driving forces have been identified as having important spatial impacts:

- globalisation and internationalisation, including trade and financial markets and the capacity of regions to confront these trends
- ageing and a rising dependency ratio (although this plays at the national, less at the regional level)
- the development of information and communication technologies which will be the major component of the knowledge economy aimed for by the Lisbon strategy and which currently show a very uneven distribution across the European territory.
- increasing income gaps based on difference in qualification of the labour force heightening the potential of spatial segregation

The scenarios are placed within a system of two axes representing policy priorities, cohesion and equity on one axis and efficiency and competitiveness on the other. These two axes have not been selected arbitrarily. In fact, the underlying rationale for this choice can be found in the European Union's own approach to its economic development. Perhaps the best statement regarding the ambitions of the European Union in terms of the economy can be found in the Lisbon/Göteborg strategy to become by 2010 'the most dynamic and competitive knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion, and respect for the environment'. This dual emphasis on efficiency/competitiveness on the one hand and equity/cohesion on the other comprises the underpinnings for the two scenario axes (we have chosen not to include sustainability/respect for the environment as an independent variable in our analysis). Furthermore these two axes are conventionally positioned against one another as a simple trade-off, but the scenarios will show that they are better viewed as dimensions that are not necessarily mutually exclusive.

● **Scenario 1: 'Best foot forward'**

This scenario describes a situation where the EU pursues a strong policy in favour of economic competitiveness. Well-performing regions and sectors are bolstered in order to allow them to achieve an internationally elite status in the global knowledge economy. Matters of cohesion and sustainability are secondary.

Efficiency considerations will gradually dominate European and national policies, Europe following the objective of catching up with the US and the Far East in respect to competitiveness and growth. The rate of investment will be increased and investment will go mainly to high-tech and competitive sectors of the economy. Institutions, regulations and policies which are regarded as obstacles of competitiveness and catching-up, will be revised and reforms serving growth and competitiveness will be implemented. Other government expenditures will be restricted, which will have an impact on social, employment, environmental and cohesion policies. Simultaneously, business environment will be improved: corporate taxes and regulations (e.g. concerning employment) will be

reduced and new entries into the market will be facilitated. State aid will mainly support R&D and innovation. Obstacles to the mobility of capital and labour will be reduced, taxation will be harmonised at a relatively low level.

While the growth in Europe as a whole will be more dynamic, it will be accompanied by growing regional (but not necessarily national) disparities. Larger metropolitan areas with sufficient facilities like universities will profit from the shifts in EU policy. At the same time, less populated regions will decline further. This is also likely to contribute to additional pressure on the existing transport infrastructure in the Pentagon, and will probably result in higher levels of environmental pollution.

- **Scenario 2: 'EuroTigers'**

This scenario describes a situation where the EU pursues a strong two-pronged strategy of economic competitiveness and territorial cohesion. This is currently articulated in the Lisbon/Göteborg strategy, which aims at competitiveness, cohesion and sustainable development, and thus echoes the principles stated in the ESDP. The concept of polycentricity is used as a vehicle to achieve implementation.

While large enterprises and advanced regions will adapt to the new requirements based on (own and external) private resources, knowledge-based and innovative development of small and medium-sized firms and of more peripheral regions will be supported by EU and national policies. It assumes also that a more differentiated approach will be applied to countries and regions that are in quite different situations. According to the EuroTigers strategy, support is given to areas with the potential to become competitive on a global scale. Consequently, new competitive knowledge and innovation centres will emerge both inside and outside of the 'Pentagon' and in metropolitan areas. The EU and cohesion policy will play a more active role in these developments than previously. The most lagging regions are largely 'written off' as having little promise for improving the EU's competitiveness. Like the other scenarios, it is assumed that current globalisation trends will continue as well as the rise of the knowledge economy. It furthermore assumes that external conditions will be favourable, or at least non unfavourable, and enabling to implement the reform of the European Union.

The outcome of the scenario is [although the MASST model has to confirm this] a slightly higher total GDP growth than the 'best foot forward' scenario and considerably higher growth than the next two scenarios. This is due to improved effectiveness of stimuli. The effect on territorial cohesion will also differ from the previous scenario. Here, it is expected to increase at the macro level (rather than decrease) but decrease at the meso level.

- **Scenario 3: 'The Beaten Track'**

This scenario describes a situation where the EU pursues a strong policy in favour of cohesion. Lagging regions and sectors are bolstered in order to allow them to achieve a status fitting for a civilised Europe. Matters of sustainability and cultural heritage are a major contributing factor to this strategy: especially clean industry and knowledge-oriented businesses are stimulated in lagging regions, making it unnecessary to relocate to find work.

EU and national structural support will continue to flow to less developed member states and regions. This includes support for infrastructure and environmental investments, but also for human resource developments in these lagging regions. The goal is to make all

European regions self-sustaining and have a reasonable quality of life; nobody should be forced to abandon his or her homeland to find a job and no European citizen should live in abject poverty.

On balance disparities among countries and within countries are expected to decrease. The decrease of disparities among countries is due to two factors: first, in absence of massive R&D and innovation incentives and pressures even the leading European regions will not be in the position to carry out the breakthrough in productivity and high tech technology, second, EU and national cohesion and structural policies, focusing on most peripheral and underdeveloped regions, contribute largely to this convergence process.

- **Scenario 4: 'Balnibarbi for the Balnibarbians'**

This scenario describes a situation where support for European cooperation wanes, and nation states reassert their authority. At the EU level both competitiveness and cohesion policies as well as other sectoral policies are reduced. Competition between member states increases, and territorial disparities increase as well.

Populist politicians and part of the national elites pursue alleged national interests in a way which would significantly weaken the cohesion and integration of the European Union. This political movement is the result of domestic economic and political difficulties, for which politicians scapegoat the EU, the enlargement, the widening or the deepening of the EU. One reason for this change in policies is the short-term disappointment and frustration with the results and impacts of enlargement either in the old or in the new member states or in both. National governments do not comply with their commitments to European policy objectives and regulations. Obstacles to free movement of labour are maintained, the period of derogations is extended. The regulations of EU competition policy will be more frequently evaded. This is the reason why the advantages of integration can be less and less exploited and, simultaneously, the effectiveness of cohesion policy will be also reduced.

By and large, the combination of weak efficiency oriented policies with a weak cohesion policy at the European level in combination with re-nationalization tendencies in terms of structural policies, have ambiguous impacts. A smaller budget for cohesion purposes at the European level will deteriorate the chances of the less developed countries (and their regions) to catch up economically. Against this background, regional disparities between the states in Europe and within them are likely to become greater. Furthermore, the absence of a strong European structural policy which had a broad focus on R&D and training activities until 2013, will weaken not only the innovative capabilities of the disadvantaged regions but the overall innovation performance in Europe.

Governance (see Section 2.5)

- **Key trends and driving forces**

In all European countries, the trend has been towards the creation or reinforcement of intermediate (regional) levels of governance. This entails the development of a greater vertical sharing of responsibility, thus fostering more integrated multi-level governance. The application of the principle of subsidiarity has been important in developing the regions, as it has made it possible to have a greater strategic approach to regional development, closer to the needs and specificities of each region.

The nature of and reasons for regionalisation differ between countries, but the overall tendency seems Europe-wide. The team has identified several types of regionalisation dynamics, including administrative regionalisation, regional decentralisation, regionalisation through the existing local authorities, regional autonomy, and regionalisation through the federate authorities.

A second important element concerning governance of territorial development is the growing awareness of the need for inter-sectoral coordination of policies, thus strengthening an integrated territorial approach to policy-making. This aims at reinforcing the objectives of EU cohesion policy by harmonising different EU and national sectoral policies for a given territory.

- **Scenario 1: 'Let a hundred flowers bloom...'**

In this scenario, the Regions have been strongly empowered by the Nation-states. Of course, the extent of regionalisation is still uneven throughout the European Union, but the bases for regional political action have been set up. A small number of Regions actively take the lead in the political rise of the Regions in European affairs, where they feel that they can make a difference. The European debate is enjoined by the Commission, the Member-States and the Regions, with a more even distribution of functions and responsibilities now existing between them. At the same time, in the light of the well-documented problems of governance and public policy provision the mixed results displayed by the traditional sectoral policy approach lead to integrated territorial governance experiments in a number of test-regions. The short-term positive feedback gained here see this approach expand to include other regions over the longer term.

Regionalisation goes through three consecutive steps: the creation of administrative regions, regional decentralisation and, finally, regional autonomy. Territorial governance is reached through another three-step process starting with multi-level governance continuing on to thematic cross-sectoral coordination to finally attain an integrated territorial approach. Main outcomes are a strengthened political role of the regions and the appearance of mega-regions.

- **Scenario 2: 'Divide and rule'**

In this scenario, most States put the process of political regionalisation on hold and devolve only administrative functions to the regions. The States maintain that their citizens remain strongly attached to their national identities. The introduction of the region as a political entity is perceived by both the states and the municipalities as a threat to their ability to fulfil their prerogatives. Moreover, they argue that the challenges facing Europe were too important to address and that this is not the right time to experiment with new types of policy-making. Emphasis is thus placed on upgrading the efficiency and coherence of existing European and national level policies. Sectoral policy-making thus remain the priority when dealing with territorial issues.

Regionalisation is stopped and focus is put on the efficient cooperation between national and municipal levels. European Sectoral Agencies (ESA) organise the coordination of sectoral policies between EU and national level. Regional policy is renationalised, but municipalities group on a voluntary basis into Local Areas of Cooperation which can be cross-border. The lack of coordination between policy sectors engenders the creation of an Agency for the Monitoring and Evaluation of European Sectoral Policies with the aim to ensure that the various ESAs do not have a contradictory effect across the European territory.

Enlargement (see Section 2.6)

- **Key trends and driving forces**

Enlargement has historically occurred in an increasingly regular set of 'impulses', the pace of which we can see has perceptibly quickened since the end of the Cold War. The economic necessity of membership became the predominant driving force for a number of countries, however enlargement could only take place if two basic factors were in place, namely, favourable economic circumstances and plans for further integration in new fields. As such, deepening and widening have been umbilically linked from the outset. Between 1973 and 1995 enlargements were handled in roughly the same manner where the prospective entrant had to align itself to the *acquis* and bear the short-term fiscal burdens of entry in the expectation of long-term political and economic gains.

This pattern was however fundamentally altered in the 2004 enlargement where significant levels of pre-accession assistance were required by all the new entrants. With concrete plans for four new members already being developed, plus the existence of three EFTA/EEA members that could, under the right circumstances, apply at any time, and as many as twenty more countries seeking either full membership or, at the very least, a partnership agreement in the context of the new Neighbourhood Policy, questions over European identity, the 'boundaries' of Europe and the ultimate size of the EU look set to continue.

Four discrete drivers of enlargement are: economic success, the fear of being 'left behind', institutional/bureaucratic 'dynamics' and political stability/wider civic duty. They are not equally potent across time. Recently, the most important driver was the quest for political stability

- **Scenario 1: 'Europe as a 'marketplace''**

This scenario postulates that the forces of marketisation, individualism, liberalism, and decentralisation win out as intergovernmentalism prevails over federalism in the EU, and the choice is thus made for widening over deepening. The EU contracts in terms of functions to conform to the liberal ethos of the 'night-watchman' state, providing only for 'soft security' and the overseeing of the proper and unfettered functioning of the market. The *raison d'être* of the new EU is enshrined as the Lisbon goal of 'competitiveness.' The EU Constitution is ratified to consolidate this vision, while the EFTA/EEA states (Norway, Switzerland, Iceland) as well as Turkey and the Western Balkan states all accede to membership of the Union before 2030. The EU however becomes far less cohesive given the difficulties of integrating so many new and, for the most part, relatively poor members in such a short space of time. The main objective of the European Neighbourhood Policy (ENP) is to promote the establishment of Free Trade Areas in the large neighbourhood zones on the EU external border in the Mediterranean region and in the states of the former Soviet Union. EU Cohesion Policy is gradually nationalised, as it is assumed that the member states themselves can better deal with the question of regional disparities. As a result, the EU's Structural and Cohesion Funds are essentially starved of resources, and thus the pressure of enlargement on the EU budget is lightened considerably.

Disparities across national GDPs in the EU36 would be much larger than that either for the EU25 or the EU27. The same applies in respect of regional disparities. Turkey's eastern

regions together with some regions of the Western Balkans will have the lowest per capita GDP in the EU36.

- **Scenario 2: 'Europe as a 'temple''**

This scenario postulates that the Lisbon goal of 'competitiveness' is still highlighted, though its implementation is now handled rather differently as the Gothenburg principles in respect of 'sustainability' are given a more prominent role. Here the broad forces of communitarianism, welfarism, sustainability, and integration continue to temper the 'market-centred' intergovernmentalist approach, while a choice is made for deepening over widening. As such, only Romania and Bulgaria – to whom promises were already made – gain entry (the EFTA/EEA members declined to apply), while Turkey is finally denied entry once and for all. Europe then concentrates on acting as a 'torch bearer' for sustainability and for the new 'hydrogen' economy which attempts to integrate environmental, welfare and territorial cohesion concerns in an attempt to develop a 'Euro-centric' approach to the demands of globalisation. This can however only be done through further integration, which in itself is only practical if it is undertaken on the basis of the 'variable geometry' approach. Increasing tension however arises between the 'inner' and 'outer' cores over the ad hoc nature of the variable geometry approach, and in particular over the costs involved, causing some in the 'outer' core to contemplate leaving the Union altogether. Meanwhile, the potential for the Union's 'neighbours' – now certain of their 'marginalised' status – to become more troublesome increases.

Per capita GDP of both Turkey and the Western Balkans', as well as that of the other neighbouring countries will be very low. Moreover this difference between all of these states and the EU27 average will further increase over the period 2005-2030. GDP inequalities among the regions of the EU27 (+1) will be rather less than in the case of the Market Scenario, although they will remain significant even during the period 2015-2030.

Rural development (see Section 2.7)

- **Key trends and driving forces**

In terms of land-use, agriculture occupies by far the largest part of rural areas in Europe. In terms of economic functions, however, the role of agriculture has significantly declined over the past decades. At the same time a number of other economic functions have emerged and developed in rural areas, like industrial, residential, tourist, and leisure functions. As a result rural areas have undergone a process of socioeconomic diversification.

Agriculture has undergone substantial structural changes. Due to intensification and scaling-up of production the number of farms and the rate of employees working in the primary sector decreased and the average farms size and the useful agricultural surface increased. The production of major crops, like cereals, increased. Permanent crops, like vine, and surfaces still in grass, however, decreased.

The CAP proved to be so successful that within 20 years Europe was able to produce more than enough food for its own population. Exports were rising sharply and surpluses mounting. The CAP was and is gradually reformed, e.g. by introducing production quotas,

by decoupling payments from production, and by introducing agri-environmental measures and measures for rural development. Despite all reforms the CAP is still a costly endeavour.

Although the CAP was primarily designed to improve the agricultural productivity it has significant territorial impacts. Market price support benefits richer rural areas more than other rural areas. The same is true for less favoured areas and agri-environmental payments. Pollution by agriculture has been reduced but not stopped and small-scale landscapes are still under pressure. The CAP hasn't stopped the process of territorial dualisation in rural areas either.

New niches in consumers' preferences may provide opportunities for environmentally friendly and healthy production. Alternative income sources, like tourism, manufacturing, and ICT may improve the socioeconomic viability of rural areas. Furthermore, agriculture and rural areas may play a new role in renewable energy production, like the production of bio-fuels and wind energy.

- **Scenario 1: 'Open Market'**

In this scenario the CAP is felt too much a burden for the EU budget and awareness rises within the agrarian lobby that in the context of WTO negotiations the sector has to become more competitive on the world market.

The open market strategy transforms the agricultural sector gradually but certainly into an open and competitive economic sector. Pillar 1 and Pillar 2 measures are first gradually reduced but finally completely abolished. In order to implement the process successfully and to provide farmers and rural areas the opportunity to adapt to the free market the implementation of the strategy is stretched-out over a period of 25 years.

The liberalization of agriculture has substantial impacts on general welfare. With regard to agriculture and rural areas, however, a process of intensive dualisation takes place. The number of farms decrease but the average size increases substantially. Large-scale arable and dairy farming decreases in Northwest Europe but increases more in Central and East Europe and Turkey. Intensive cattle farming and horticulture are also very successful on the world market. Experience farming and agricultural nature and landscape management, however, hardly survive. Rural areas in urbanized regions, which were attractive for tourism or in which agriculture dominated are very successful in terms of socioeconomic viability and also become more populated, but rural areas with a variety of activities or with low accessibility are faced with a downward spiral. Furthermore, the intensification and scaling-up of agricultural production and the booming of mass-tourism causes severe damage to nature, landscapes and the environment.

- **Scenario 2: 'Sustainable Rurality'**

In this scenario, the growing awareness of the environment (stimulated by several incidents related to climate change), the fact that the EU after the enlargement of 2004 faced a great challenge regarding cohesion, and the increasing pressure of the WTO to liberalize the markets for agricultural products pave the way for a strategy of sustainable rurality.

The sustainable rurality strategy transforms the agricultural sector to a large extent into a sustainable economic sector. Pillar 1 measures (commodity market support and direct payments) are significantly reduced but at the same time Pillar 2 measures (now defined as 'integrated rural development') are strongly enhanced. In order to implement the

transformation successfully and to provide farmers and rural areas the opportunity to adapt to the new conditions implementation is stretched-out over a period of a generation.

The sustainable rurality strategy has large impacts on general welfare but not as large as the liberalization strategy. With regard to agriculture and rural areas dualisation is reduced and cohesion is enhanced. The number of farms decreases but the average size rises. Many large-scale dairy and arable farms move to Central and East Europe. Dairy farming and intensive cattle farming are successful on the world market. Experience farming and agricultural nature and landscape management are successful on regional markets. Arable farming, however, loses market shares. Rural areas in urbanized regions, which were attractive for tourism or in which agriculture dominated experience increasing socioeconomic viability and further population growth. The same is true for many rural areas with a variety of activities and to a lesser extent for some rural areas with low accessibility. Intensification and scaling-up of agricultural production are combined with development of nature and landscapes and reduction of pollution.

Climate change (see Section 2.8)

- **Key trends and driving forces**

Climate change is accelerating due to human influence. Greenhouse gas emissions from transport, industry and other sectors lead to increasing atmospheric concentration, which in turn leads to rising temperatures.

A large time lag exists between emission rates and temperature rises. A sudden stop of emissions now would only result in temperature stabilization in 50 to 100 years time. Predictions are that the average temperature in Europe will rise between 2.0 and 6.3 degrees Celsius until the year 2100. Increase will be highest in Southern Europe. At the same time, rainfall will be less in the South, whereas Northern Europe is expected to receive more rainfall.

Most important impacts are water shortage, desertification, forest fires, decreasing tourism and agriculture in Southern Europe. In the north, floods are expected to be more intense and frequent. Agriculture will expand northwards. Mountainous areas are affected by shrinking winter seasons, negatively affecting tourism. Biodiversity is at threat in most areas. And with frequent heat waves, human casualties will increase.

There are two coping mechanisms to deal with climate change: mitigation and adaptation. Mitigation measures try to reduce greenhouse gas emission and therefore temper the magnitude of climate change. Adaptation measures are interventions to deal with the impacts of climate change. Adaptation can be pro-active, or preventive, which means that investments take place to prepare for events that might eventually happen. They can also be re-active; this kind of measures deals with the consequences of an impact which already happened.

Policy reaction to climate change is ambivalent. Although many sectors of society perceive the seriousness of the problem, uncertainties about the necessity and the effectiveness of costly and sometimes unpopular measures prevent serious action, both for mitigation and for prevention.

- **Scenario 1: 'Repairing instead of preventing'**

The potential magnitude of climate change over a long time period has been recognized, but the main players in the policy arena are reluctant to take preventive, sometimes drastic measures, mainly because such measures are not popular and may even be politically counterproductive.

Adaption policies to climate change are minimal. Other priorities in the public debate overshadow climate change impacts, and the large uncertainties about climate change and its impacts refrain politicians from taking severe prevention measures. Mitigation policies reducing greenhouse gas emission, such as the Kyoto Protocol and its successors, are not very successful.

As a result, negative consequences of climate change are repaired by subsidies and hazard funds, without structurally adapting territorial systems to the changing circumstances. Tourism in Southern Europe becomes more expensive because of elevated water prices; numerous rural areas are abandoned because of unfeasible agriculture, leading to extensive forest fires and desertification, further aggravating the problem of water supply to river and coastal plains. In Northern Europe, floods cause much damage because of insufficient protection measures. On the other hand, rural areas in Northern Europe flourish due to increased activities in the agricultural and tourism sectors.

- **Scenario 2: 'Anticipation of climate change by prevention measures'**

The scenario is based on the assumption that only prevention measures in various fields are likely to alleviate the negative territorial impacts of climate change, in addition to the fact that the Kyoto Agreement is enforced and will generate positive impacts on climate change in the very long term.

The EU embraces the idea of structurally adapting territories to new climatic conditions. In Southern Europe this means a structural change of agricultural sectors, shifting to heat resistant, low water demanding crops and efficient water supply systems. Agricultural and forest systems are developed that enable the maintenance of dry Mediterranean landscapes, reducing risk of desertification and fire and improving water retention capacities. Large scale tourism projects are abandoned and replaced by more specific touristic sectors like nature and culture. Adaptation to water shortage and mitigation of greenhouse gas emission encourage the development of renewable energy sources throughout Europe. In Northern Europe, flood risks are widely combated by migrating economic sectors from most vulnerable river plain areas, hereby extending river beds.

As a result, negative consequences of climate change are largely contained. The cost is that certain areas in Southern Europe and mountainous areas see incomes decreasing, because certain economic sectors (intensive winter and summer tourism, certain agricultural sectors) have to be given up. On the other hand, a knowledge economy on innovative agriculture, water management and landscape management evolves, and rural areas are not further depopulated.

Concerning mitigation, strict agreements on emission reductions lead to severe transport policies. Despite ever growing transport figures, promotion of clean technology manages to maintain emission levels. Public transport, railways and waterways became more important.

Socio-cultural issues (see Section 2.9)

- **Key trends and driving forces**

Several, very diverse, driving forces influence the evolution of the socio-cultural fabric of European society. These include the globalisation and European integration processes (unification of lifestyles and of cultural behaviour), progressing immigration into Europe, bringing with it different socio-cultural patterns and behaviours, technological evolution (impacts on consumption, leisure and mobility patterns; on employment/unemployment and social exclusion), population ageing, bringing with it different values, lifestyles, mobility patterns, EU-enlargements with the accession of societies which have been living prior to 1989/90 under communist regimes and socio-cultural integration policies at various levels; multiculturalist approaches.

These trends lead to an opening of society, but at the same time engender economic dualisation tendencies, accompanied by spatial segregation. At the same time, the changes in labour markets and technology increase the number of tele-workers and commuters.

- **Scenario 1: 'Non-mastered socio-cultural integration'**

The main hypothesis of the scenario is one of increasing socio-cultural tensions and disruptions in Europe. Tensions between income groups, ethnic and religious groups are increasing and public policies are not successful in promoting social inclusion and integration as well as tolerance between the various cultural communities.

Socio-cultural tensions and disruptions are favouring the move of people out of large cities and urban regions towards more 'socially quiet' areas (small and medium-sized towns, rural areas). This is particularly obvious for retired people who are not to workplaces. Other segments of the population are also concerned, however. An increasing number of active people chose to commute over long distances or to turn towards home-working. Pressure on attractive areas is increasing because new forms of Greenfield settlements with more secure character can be developed.

There are significant negative environmental impacts from growing motor-car traffic, resulting from both substitution to increasingly insecure public transportation and stronger commuter flows. In cities, dereliction and multiple deprivation expand significantly.

- **Scenario 2: 'Towards a sustainable multicultural and socially cohesive Europe'**

The scenario assumes that new public policies are defined and implemented at the various levels which aim at integrating as many people as possible into the labour market through education policies, at facilitating social cohesion between the various ethnic and religious communities, at promoting regional identities as factors of integration and development. It also assumes that the EU immigration policy will be more targeted and orientated towards attracting qualified people.

Less people, in particular the retired ones, are inclined to leave the cities and to settle in distant rural areas. The spatial segregation of generations is alleviated.

Most positive impacts are to be observed at the regional/local level, especially in and around metropolitan areas as well as in less important cities. The expansion of deprived areas is limited and the rehabilitation of a number of these areas is successful. The development of gated communities is contained and concerns only a limited number of sites attracting 'international clients' (tourist, retired people) in high-standing, highly attractive areas.

Compact cities are maintained, serviced by public transportation and less dependent upon motor-cars. Pressure on surrounding open spaces and rural areas is limited as the progress of suburbanisation is contained.

First ideas and policy recommendations

The Nijmegen Guidance Paper proposes to see policy recommendations as a description of policy options, i.e. possible choices that are open to policy makers. In the sense of this definition, the scenarios presented in this report are policy recommendations by themselves, as they present different policy options and their possible consequences until 2030.

The main information policy-makers should look for in the scenarios are the driving forces and how they might interplay with each other as well as the differentiated, multi-sectoral impacts of specific policies. The final images painted at the end of each of the scenarios allow imagining the consequences of particular choices on the global picture of the European territory. Thus, the link between current policy debates and future evolutions becomes more tangible and decisions can be taken on the basis of informed estimations of possible impacts.

The upcoming territorialisation of the scenarios will make them even more relevant even to policy makers at a regional scale.

Proposal of a communication strategy

ESPON 3.2 requires a number of specific objectives to be met in relation to communication, consultation and validation throughout the project. These include the following requirements:

- To prepare the scenarios in a cyclical and dynamic process allowing the Monitoring Committee to take active part in the 'scenario team', where the scenarios are gradually developed and tested before the final results.
- To prepare and support a communication process exploring the scenarios at political level, that can improve the understanding of spatial development trends and issues of territorial cohesion within an enlarged EU. A communication strategy could include different elements from informal consultations to futuristic stories supported by cartographic illustrations.

The team has applied a related strategy through close coordination with the ESPON Monitoring Committee concerning the choices of scenario themes and hypotheses and through general discussions with the ECP network, Interact partners and other actors.

Now that first drafts of scenarios are available this communication should be intensified with two main aims:

- validation of the results, both within ESPON and outside through contacts with the expert panel
- dissemination and information about the results to a wider public of policy makers at different scales.

The team proposes to integrate the specific scenario-related communication strategy into the overall ESPON communication strategy, thus avoiding overlaps and miscommunications and linking the scenarios to the results of the other projects which allow policy makers to go deeper into certain subjects.

Tools (see Part 3)

Macroeconomic, Sectoral, Social and Territorial Model (MASST) (Section 3.1)

The MASST model is an econometric model with the aim to measure the determinants of regional development and regional imbalances; once the causality relationships are estimated, the model estimates future quantitative changes in regional income and regional inequality. The outcome of the MASST model will be different territorial settings of the new Europe based on conditional quali-quantitative hypotheses on future trends of macroeconomic and institutional driving forces; each future territorial setting will define winners and losers, and will identify new levels of regional disparities

The MASST model identifies regional growth as the sum of a national component, since a national economy influences the dynamics of its regions, and of a regional component, as each regional economic growth differs from the average according to the degree of competitiveness of the local economy. The national component analyzes national growth as dependent on changes in the aggregate demand components. The regional component estimates the competitiveness of the regional economy, and focuses, therefore, the attention on long term structural elements stemming both from the geographical location of a region and from its productive and institutional structure.

The MASST model is able to take into account macroeconomic, technological, institutional, demographic and socio-cultural driving forces.

A lot of data has been achieved collected, using different sources, but some data are still missing. The important missing indicators are.

Single driving force impact forecasts will be produced on maps as a first step towards more integrated scenarios. In this respect, some qualitative thematic scenarios, when based on opposite hypotheses on the driving forces, can be mapped. However, despite this support to qualitative thematic scenarios, the most interesting and crucial outcome of the MASST scenarios will not be thematic scenarios, but rather cross-thematic scenarios, based on a combination of different hypotheses on the driving forces. Each scenario will be the result of a cause-effect chain, which will influence variables of different nature (demographic, technological, macroeconomic).

Three main lines of research will be developed for TIR (due in January 2006):

- the database will be finalised;

- the first parameter estimations of the model will be run;
- model runs in support of the qualitative scenarios
- first cross-thematic scenarios

Know Trans-European Networks (KTEN) (Section 3. 2)

KTEN is currently a metamodel focused on passenger interregional trips. The goal of KTEN's further development and application within ESPON3.2 is to provide an interactive metamodel framework to include most of the strategic aspects missing in more specialised transport forecast models. The objective of KTEN improvements has been double: to extend the metamodel to cover freight, and to enrich the scenario-building capabilities to cover significant variables which include and explicit spatial dimension, consistent with other ESPON3.2 developments.

KTEN is, therefore, not 'just' another transport model, but it is a policy-support expert system based on existing modelling results. The main aim is to help policy-analysts explore the sensitivity of main trends to some key variables, and to verify the consistency of scenarios. The integrated set of metamodels can also contribute to the analysis of policy impacts, to the extent that current advanced models have been able to forecast them. Full transparency and interactivity are key requirements to make such tools a learning experience for end users to the difference of classical forecast models which are often too complex to understand for the non-expert.

KTEN passenger produces origin-destination matrix by passenger trip purpose and mode at NUTS2 level for EU29. KTEN freight model outputs are origin-destination matrices of freight transported by each type of mode at NUTS2 level for EU27 (as data for Romania and Bulgaria are currently missing).

KTEN freight uses three scenarios for the horizon year 2020 defined by the TEN-STAC project (TREND+, EUROPEAN, and EUROPEAN+). An easy user-interface allows to chose following parameters relating to the change of relations between countries, to choices of TEN-STAC policy scenario, to elasticity of GDP and population, etc.

European Territorial Cohesion Index (Section 3. 3)

The aim of the research on a ETCI developed in ESPON 3.2 is to develop a technical tool for evaluation of scenarios. The introduction of the expression 'territorial cohesion' has introduced a confusion because the intention of the researchers engaged in this WP has neither been to propose any kind of global synthesis of previous ESPON results (as it was done with ESPON 3.1 RCE, Regional Classification of Europe), nor to propose any kind of criteria for the allocation of future structural funds during the period 2007-2013.

The initial idea was simply that each scenario should be evaluated in a quantitative way with a synthetic indicator which should take into account the three fundamental objectives of ESDP: economic competitiveness, social cohesion and sustainable development. This synthetic index should be better than GDP/inh. (which takes into account only the economic dimension) but should remain very simple because, in the framework of ESPON 3.2, it was necessary to estimate trends both in past (1960-2000) and future (2000-2030).

In a first round of research (partly presented in the FIR of ESPON 3.2) we have tried to explore the literature on composite index (like Human Development Index) in order to realise a state of the art on the different possible ways to combine different criteria. We also explored the different ways to improve synthetic indices by innovative methods of spatial analysis like maps of discontinuities or discriminant analysis.

Secondly, we have tried to clarify the definition of the concept of territorial cohesion. As a first conclusion, territorial cohesion is a notion at the same time plurisectoral and multiscalar. It must be understood not in a static but in an evolutionary way, and has to be integrated into policies in a 'multilevel governance'. As accessibility becomes a central concern and as the essential services are taken into account, a particular stress must be put on measuring cohesion through accessibility to these services.

In the second round of research developed since January 2005, we decided to postpone the research on statistical and cartographic tools and to focus more on the availability of data which could be used for the development of a composite index taking into account the three dimensions of ESDP and the definition of territorial cohesion. This analysis of the data situation in regard to political expectations on territorial cohesion led to the pessimistic conclusion that it is probably not possible currently to build any relevant index of territorial cohesion in the framework of ESPON database. Indeed, only the economic dimension appears to be well documented, but very little information are available at regional level for the evaluation of environmental sustainability and practically nothing for social cohesion.

The actual situation of the ESPON database (which is also the situation of EUROSTAT) lacking social and environmental data has produced a vicious circle. If the results of the ESPON programme are used by policymakers, they will reinforce the usual domination of one dimension of the ESDP (economic) and comfort the common feeling that the other dimensions (social & environmental) are not really important for the future.

In the framework of project ESPON 3.2 which has to focus on scenario building, the problem is not to measure precisely the phenomena but to obtain a rough quantitative evaluation of the distribution of the allocation of health resource and to use this rough estimation for various simulations of trends which could occur in the future according to opposite extreme assumptions like full privatisation and liberalisation of the health system or, on the contrary, building of a global European system of social security.

We, therefore, propose a regional (NUTS2) estimation of health expenditure per capita based on state-level relationship with GDP/capita.

The most remarkable result of the estimation is the strong increase of the intensity of the territorial discontinuity between old and new member countries: the relative differences between regions located on both side of the former border of UE15 are generally a ratio higher than 1 to 5 for the criteria of health expenditure when they are 'only' a ratio from 2 to 4 for the criteria of GDP/inh. This reflects the assumption that differences in terms of social well-being are probably much greater than differences in terms of economic level.

This very strong territorial diversity can have many social consequences at local level, like important emigration of health practitioners from east to west and more generally the intensification of 'brain drain'. Generally, border effects seem to be much more important on this health criteria than for GDP/inh. because social systems can change dramatically across the borders.

This first attempt of assessing health expenditures at regional level will be strengthened in the next months by further analyses at the regional/ local level, in order to combine them with the question of accessibility to essential services, central in the concept of territorial

cohesion. If this attempt is validated by the ESPON Monitoring Committee, further versions of the composite index can be proposed in the future, allowing the visualisation of scenarios as regards territorial cohesion.

Long-term Database (LTDB) (Section 3.4)

The elaboration of a long-term database has two main objectives: supporting scenario building through the availability of long-term quantitative data, but also preparing a database structure for ESPON which will allow long-term sustainability of ESPON data across changes in spatial units and indicator definitions.

To that end, the team has developed a unifying model which allows to re-use what exists, to free ourselves from the heterogeneity of different data sources, and especially, to bring an added value in the exploitation of these sources:

- in the support that this model offers to manage in a coherent way the three-dimensional (set of themes, space and temporal) and especially evolutionary (very related to temporal dimension) character of information
- in the capacity which it has to integrate data from different sources to give a more complete representation than what would be possible with only one data base source
- in the mechanisms than it offers to manage the fact that missing data can be estimated, that corrections can be made if need be, etc

The contents of the database will be progressive and will take into account the trace of basic information and its genealogy through extensive metadata. Estimation methods will be used to fill information gap and imprecisions. These will be stored in the database, and, for each type of indicator, estimation strategies will be recommended to the user, but the latter remains free in her choices.

Three assumptions underlie the use of the model and in particular the application of the interpolation processes:

- The starting point is represented by the distributions (simple indicators) in year 2000, at a State level.
- Temporal series will be also developed at a State level for a given period.
- The regional distributions will be appreciated in each official State division.

The aim of the LTDB is not to collect an important number of indicators but to focus on the most useful and general criteria which can be a basis for the elaboration of policy scenarios. The analysis of data situation by IGEAT and Géographie-cités lead to the conclusion that the most interesting indicators that we can expect to harmonise during the year 2005 concern demography, active population and GDP.

The most difficult problem to be solved is probably not the collection of numbers (which are available in most cases) but the precise identification of territorial units which are characterised by these numbers. As explained in previous section on data modelling, the crucial problem for the LTDB is to identify very precisely the timetable of administrative change of territorial units in all states of the ESPON area. The fact that the name of a territorial unit remains the same is not necessarily a guarantee that the spatial extension also remains the same. The task of compiling a history of territorial units goes far beyond

the scope of project 3.2, however, and should be dealt with separately within ESPON or even Eurostat.

The challenge of precise recomputation of old databases in current administrative division is clearly also not for ESPON and is rather relevant for national statistical institutes, Eurostat or Inspire. What can actually be done in ESPON 3.2 is to provide estimations of main spatial trends with a degree of precision which will be lower than usual NUTS2/NUTS3 division but at least better than simple distribution of evolution by states. Smoothing methods based on gaussian neighbourhood presented in ESPON 3.1 and to be developed further in the next months by project ESPON 3.4.3 (MAUP) are probably the most useful for this task.

As an example of possible usage for the long-term data, two maps are presented concerning the evolution of population in central part of Europe from 1960 to 1985 and the evolution of population of the ESPON-29 area between 1980 and 2000.

Scientific Guidance

The main objectives for the next two years for the ESPON scientific platform are the following:

- ***concepts***

- final version of ESPON key political concepts glossary
- final version of inventory of concept usage

- ***indicators and typologies***

- application of data update strategy, including pool of indicators for annual key indicators
- dictionary of ESPON indicators and typologies

- ***data management***

- proposition for integration into long-term database

- ***tools and methodologies***

- ESPON tools/methods navigator

The main challenge in the near future will be a revision of the ESPON indicator and typologies list to select key policy indicators and to evaluate maintainability. The other objectives are explained in detail in the Nijmegen Guidance Paper, annexed to this report.

Chapter 1 First ideas and policy recommendations for a possible use of the developed scenarios and orientations in the European process

From scenarios to policy recommendations

There is an ongoing debate within ESPON concerning the best approach to policy recommendations in ESPON projects. Policy makers have complained that recommendations are either too general or too precise, or that they are not based on scientific findings.

The Nijmegen Guidance Paper contains a chapter on policy recommendations which proposes to see policy recommendations as a description of policy options, i.e. possible choices that are open to policy makers. TPGs should show these options and the possible consequences, based on the scientific findings concerning trends, relationships and driving forces.

In the sense of this definition, the scenarios presented in this report are policy recommendations by themselves, as they present different policy options and their possible consequences until 2030.

How to read the scenarios for policy-relevant results

Obviously, the scenarios should not be seen as deterministic predictions of what is to come. Rather, they are pedagogical exercises aiming at raising the awareness of policy makers concerning possible evolutions.

The main information policy-makers should look for in the scenarios are the driving forces and how they might interplay with each other as well as the differentiated, multi-sectoral impacts of specific policies. The final images painted at the end of each of the scenarios allow imagining the consequences of particular choices on the global picture of the European territory. Thus, the link between current policy debates and future evolutions becomes more tangible and decisions can be taken on the basis of informed estimations of possible impacts.

At the current stage the scenarios are only superficially territorialized, meaning that the spatial differentiation of the impacts and trends is only mentioned very briefly. In the next few months, deepening this territorialisation will be the main objective for the scenario team. However, the scenarios can already be useful in the context of policy debates as they allow a reflection on the basis of the overall picture, in line with the ESDP vision of territorial development policies at European scale. This can be very helpful for the evaluation of spatial impacts of sectoral policies and for their coordination into an integrated territorial approach.

At the same time, as some of the trends are common to most, if not all, European regions, the scenarios can give hints to regional policy makers concerning possible evolutions at their local level and the relevant driving forces and policies to watch out for.

Concrete policy-relevant results of the scenarios

The present scenarios are draft scenarios. They still have to be validated scientifically and politically. However, they already contribute some food for thought to the current political debates. As the scenarios are not really territorialised as of yet, the policy-relevant results at this stage are mostly global observations on trends and relationships. At the same time, the current structure and orientations of the scenarios are still quite diverse (thus allowing the exploration of different ways of scenario building), with the consequence that the types of policy-relevant information to be extracted from them still differ quite strongly from one theme to another.

Demography

The demography scenarios play out the opposing policy choices of on the one hand severely limiting and on the other hand opening up immigration. The main resulting policy issues from these scenarios are

- immigration is the only important lever available to politicians to address demographic questions, although great margins still exist for public investments in child care
- other measures available for countering possible negative fiscal effects of ageing are higher taxation of capital in complement to labour, raising productivity and raising activity rates and duration
- the risk of spatial segregation of generations, with rural areas becoming retirement regions
- the rise of 'grey voting power' in retirement regions with significant changes in allocation of public resources
- a very differentiated regional distribution of immigration of which only small proportions flow into Eastern Europe
- heavy demand to structural funds for depopulated regions
- the risk of spatial (and social) segregation of different immigrant communities and, therefore, the need for important public investments in education and other social integration measures

Transport

The transport scenarios explore two quite opposite policy choices, one based on a massive investment in motorways, the other on an attempt to decouple economic development from transport growth and to strongly restrict unsustainable means of transport. The main issues raised are

- the motorway strategy brings significant economic benefits, but which would be outweighed by the intensity of resulting environmental problems
- cohesion and polycentricity are favoured more by the motorway strategy than the sustainable transport strategy
- benefits of the motorway strategy are long-term, with severe negative effects in the short-term

- there are traffic (and congestion) thresholds which can cause chain reactions in the behaviour of economic actors, in particular as far as location patterns are concerned; these thresholds might be reached in some corridors before the positive effects of the motorway strategy become visible
- because of limited public resources, a key instrument of this strategy are public-private partnerships
- the implementation of the strategy calls for coordination with EU regional and environment policies, in order to optimise the economic benefits (productivity of new infrastructure) and to minimise the environmental impacts (Natura 2000 Network in particular)
- the sustainable transport strategy relies not only upon transport policy, but also upon efficient instruments to implement the Lisbon Strategy, because transport policies alone will never achieve the decoupling between economic development and the growth of transport flows
- as numerous items among the measures envisaged are not really popular the question can be raised in how far the sustainable transport scenario is politically realistic
- in order to avoid negative evolutions of regional disparities in the sustainable transport strategy, transport and economic policies should be accompanied by other public policy measures, in particular in the field of regional policy (in order to counteract territorial imbalances), urban planning (in order to counteract land price speculation, to promote better integration of urban functions and to limit short-distance mobility etc.), governance (stronger cooperation between local authorities, administrative levels and sectoral administrations).

Energy

This scenario explores the same evolution (rising energy prices), but in two different conditions of balance between supply and demand. The following policy elements can be identified:

- the regular increase of oil price will call for stronger policies in the field of energy savings and development of renewable energy sources.
- more conventional primary energy sources such as coal will continue to be used and promoted, despite their detrimental environmental impact
- the simple fact that oil peaking (demand largely superior to supply) will occur should lead European political authorities to immediately start massive R&D programmes in order to investigate in depth the potential impacts of such a situation and to develop substitution fuels and to promote alternative systems (mobility, transportation, heating, industrial production).
- EU policies such as Transport, Energy, Environment, Regional Policy, CAP, External Relations etc. will be concerned by the occurrence of oil production peaking and will require significant adaptation.

Economy

The economy scenarios explore the interplay between two big families of economic policies, the cohesion/equity family and the competitiveness/efficiency family, thus responding directly to the question of possible spatial impacts of policy choices in the Lisbon strategy debate. The scenarios show that the two families are not necessarily contradictory, but that their effects do go into different directions. The following observations can be made:

- pushing efficiency, more than cohesion:

While the growth in Europe as a whole will be more dynamic, it will be accompanied by growing regional (but not necessarily national) disparities. Larger metropolitan areas with sufficient facilities like universities will profit from the shifts in EU policy. At the same time, migration flows will be unidirectional towards the Pentagon, and less populated regions will decline further. There will be additional pressure on the existing transport infrastructure in the Pentagon, and will probably result in higher levels of environmental pollution.

- pushing both efficiency and cohesion:

The outcome of the scenario is probably a slightly higher total GDP growth than the first scenario and considerably higher growth than the next two scenarios. This is due to improved effectiveness of stimuli. The effect on territorial cohesion will also differ from the previous scenario. Here, it is expected to increase at the macro level (rather than decrease) but decrease at the meso level.

- pushing cohesion more than efficiency:

On balance, disparities among countries and within countries are expected to decrease. The decrease of disparities among countries is due to two factors: first, that in absence of massive R&D and innovation incentives and pressures even the leading European regions will not be in the position to carry out the breakthrough in productivity and high tech technology, second, that EU and national cohesion and structural policies, focusing on most peripheral and underdeveloped regions, contribute largely to this convergence process.

- reducing efforts both for cohesion and for efficiency:

By and large, the combination of weak efficiency oriented policies with a weak cohesion policy at the European level coupled with re-nationalization tendencies in terms of structural policies, have ambiguous impacts. A smaller budget for cohesion purposes at the European level will deteriorate the chances of the less developed countries (and their regions) to catch up economically. Against this background, regional disparities between the states in Europe and within them are likely to become greater. Furthermore, the absence of a strong European structural policy which had a broad focus on R&D and training activities until 2013, will weaken not only the innovative capabilities of the disadvantaged regions but the overall innovation performance in Europe.

Governance

This scenario theme explores two possible paths in the process of regionalisation of territorial policies. These paths are also connected to the evolution of coordination between sectoral policies. The main observations coming out of this are:

- all countries seem to follow the same trends towards regionalisation, even if they come from different starting points and if the motivations might differ
- a territorial approach to making the region the focal point at which all sectoral policies are coordinated around the specific territory will support growing autonomy of the region, under the condition that the necessary resources are available
- a territorial approach might not be the most efficient way of organising sectoral policies, however, where vertical integration seems more appropriate

- more regional autonomy, especially in terms of resources, might lead to greater disparities between regions

Enlargement

The enlargement scenarios offer a contrasting picture between two policy orientations (which are not contradictory between them as current trends show): more deepening (i.e. greater integration of already existing EU aquis) and more widening (i.e. further enlargement). The following observations are made:

- deepening (especially on issues such as the environment) will be difficult in a context of widening to countries with much lower economic performance and living standards
- a focus on deepening will make the relationship with Europe's neighbours more difficult, as the border differential will increase
- widening will put the current compromises concerning structural funds to a test, as the entry of new member states will significantly lower EU average, and thus the thresholds for regional aid; this could alter considerably the context in which regional policy is formulated in the current member states
- widening will probably mean a more economy-oriented political climate, with less accent on social and environmental issues, although widening has had beneficial effects on the environment in new member countries

Rural development

The scenarios concerning rural development explore two concurrent trends, i.e. globalisation and liberalisation on the one hand, and a shift away from strictly agricultural to a more integrated policy for rural areas. The open market strategy and the sustainable rurality strategy generate various issues for policy-makers on the EU-level and other levels, such as:

- Mobilisation of the local recourses ('territorial capital') of the various rural areas in Europe
- Promoting diversified development strategies sensitive to the local potentials of rural areas
- Promoting and supporting information exchange between rural areas in the enlarged EU
- Exploitation of the development potential of tourism in rural areas
- Preventing downward spirals in rural areas with low socioeconomic viability
- Commodifying and marketing of cultural landscape and other local qualities of rural areas
- Guaranteeing a minimum acceptable level of environmental protection in rural areas
- Preventing the dissemination of genetically modified plants and seeds
- Preventing abandonment of farmland or using it in other productive ways

Climate change

The climate change scenarios concentrate on the effects of prevention against climate change effects. They show that even if climate change is a fatality, a number of prevention and mitigation policies can enable the containment of negative impacts and the limitation of impacts of generated natural hazards. Possible prevention measures include:

- structural change of agricultural sectors, shifting to heat resistant, low water demanding crops and efficient water supply systems

- development of agricultural and forest systems that enable the maintenance of dry Mediterranean landscapes, reducing risk of desertification and improving water retention capacities
- abandonment of large-scale tourism projects and replacement by more specific tourist sectors like nature and culture.
- adaptation to water shortage
- development of renewable energy sources throughout Europe
- prevention of flood risks by migrating economic sectors from most vulnerable river plain areas, hereby extending river beds.

Social-cultural issues

In the theme of socio-cultural evolutions, the scenarios paint two different pictures of possible evolutions of some current key trends such as social dualisation, immigration and integration, mobility, and ageing. The main observations at the current (preliminary) stage are:

- social dualisation is mainly based on the exclusion of populations from the labour market and can lead to reductions in economic performance
- education is a main vector of countering social dualisation as well as cultural segregation and tensions
- possible immigration policies have to be accompanied by active social integration policies
- a more inclusive (and more budget-intensive) educational and social policy can lead to higher economic performance and fiscal savings in the long-run through the reduction of unemployment and the decreasing need for social support
- social (including inter-generational) tensions will lead to spatial segregation, notably in the form of further suburbanisation and gated communities; this phenomenon is also supported by the development of tele-working
- spatial segregation and feelings of insecurity in public space will induce more individual (car) traffic

General policy-relevant results

Two general results should be mentioned concerning territorial development policies:

Measuring territorial cohesion

The research concerning the European Territorial Cohesion Index has shown that *it is probably not possible currently to build any relevant index of territorial cohesion in the framework of ESPON database* (and of Eurostat). Indeed, only the economic dimension appears to be well documented, but very little information is available at regional level for the evaluation of environmental sustainability and practically nothing for social cohesion. This is not just a problem relating to the construction of an indicator, but has much larger implications in the form of a vicious circle: as most available indicators are related to economic situation and competitiveness, most ESPON studies are related to these topics. Reversely, as very little information is available about social cohesion (and to a lesser degree about sustainable development), most ESPON (and other Europe-wide territorial) studies ignore these crucial dimensions of the ESDP. Therefore, if the results of the ESPON programme are used by policymakers, they will once again reinforce the usual domination

of one dimension of ESDP (economic) and comfort the common feeling that the other dimensions (social & environmental) are not really important for the future. If policy makers in general, and the Monitoring Committee in particular, want to break this vicious cycle they have to push for a better data availability on these dimensions (see section 3.3).

EU policies and the ESDP

One of the main aims of the ESPON programme is to evaluate the territorial impacts of EU policies. The following table, developed by the scenario team working on the economy theme, gives a very useful overview of the relationship between Eu policy and the general territorial goals as defined in the ESDP (see section 2.4.1).

| <i>Chapter</i> | Spatial Cohesion | Spatial Competition | Spatial Integration | Regional /territorial impact review |
|---------------------------|---|--|--|--|
| Agriculture | Rural development funding Guaranteed standard of living and income for agricultural communities | Increased productivity Multi sectoral integrated approach to rural economy | Market Unity Promotion of rural linkages and connectivity | Rural regions Lagging rural regions (eastern border regions) Countries with high percentage of agriculture, e.g. Poland and Romania. |
| Environment | Support for environmentally disadvantaged regions Supported for protected regions | Improved quality of life - link to development of competitiveness Improved environmental infrastructure | EU neighbourhood policy Cross-border cooperation | Heavy industrial/polluted regions Improved environmental services for urban region Vulnerable habitats |
| Transport Policy | Potential to addresses transport bottlenecks to regional development | Improved competitiveness through improved infrastructure and transport services | Cross-border linkages | Urban centres as transport nodes Capital cities, linked through TENs Increased internal integration |
| Regional Policy | Support for lagging regions and cohesion countries | Emphasis on regional competitiveness, innovation and R&D | Cross-border cooperation | Support for lagging regions and cohesion countries |
| Competition Policy | State aids to lagging regions | Removal of market barriers | Freer movement of labour (though currently restructured) | Support for lagging regions Negative impacts of migration Growth in most competitive regions |
| R&D | Support for R&D and innovation provide through structural funds New development potential for heavy industrial regions | Development of high tech zones and growth poles | Cooperation between Member States through framework measures | Well endowed urban centres, through higher tech, innovative companies also have the potential to be more 'footloose'. |
| Internal Market | New development opportunities and markets for regional economies | Free market CEE regions can compete with EU-15 for investment and business | Freer movement of persons | The most competitive regions - capital cities and western border regions |

The Acquis/Community policies and territorial goals (Table 12, p. 229)

ESPON Project 3.2
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 Policy*

Second Interim Report
 March 2005

Part 2

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ESPON Project 3.2
*Spatial Scenarios and Orientations
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Second Interim Report
March 2005

Part 2

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

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Glossary

| | |
|-------------------|---|
| AMECO Database | Annual macro-economic Database |
| AON (Assignment) | All-Or-Nothing (Assignment) |
| CAP | Common Agricultural Policy |
| CEECs | Central and Eastern European Countries |
| CORINE | Co-ordination on Information of the Environment |
| EAGGF | European Agricultural Guidance and Guarantee Fund |
| EEA | European Environment Agency |
| ESDP | European Spatial Development Perspective |
| ETCI | European Territorial Cohesion Index |
| FUA | Functional Urban Area |
| GU | Geographical Unit |
| HDI | Human Development index |
| INTERREG | Community initiative concerning border development, cross-border cooperation and selected energy networks |
| ISPA | Instrument for Structural Policies for Pre-Accession |
| JRC | Joint Research Centre |
| K+C tool | Knowledge and Communication tool |
| KTEN | Know trans-European Networks |
| MASST (model) | Macroeconomic, Sectoral, Social and Territorial (model) |
| MAUP | Modifiable Area Unit Problem |
| NEC Directive | Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants |
| NIS | New Independent States |
| NUTS | Nomenclature of territorial units for statistics |
| NWMA | North Western Metropolitan Area |
| PHARE | The Phare programme is one of the three pre-accession instruments financed by the European Union to assist the applicant countries of Central and Eastern Europe in their preparations for joining the European Union |
| RDP | Rural Development Policy |
| SAPARD | Special Accession Programme for Agriculture and Rural Development |
| SPESP | Study Programme on European Spatial Planning |
| STU | Spatio-Temporal Unit |
| SWOT | Strengths Weaknesses Opportunities and Threats |
| TENs | Trans European Networks |
| UTS | Unions Territorial Strategies |

Part 2: Scenarios

Chapter 2 Draft alternative prospective/trend scenarios and orientations

Introduction

In the first interim report, the following typology of scenario was presented:

a) roll forward (from present to future)

type 1: base-line trend scenarios: future territorial images resulting from unchanged strategies and policies

type 2: prospective scenarios: significant changes occurring in the behaviour and actions of actors (individuals, households and business) without new policy intervention

type 3: prospective policy scenarios: changes occurring mainly in one or more areas of public policies

b) roll backward (from future to present)

type 4: proactive scenarios: explore if and how future territorial situations (images) might or might not grow out of the present, what might be achieved or avoided, given available constraints, resources and technologies (strategies of private and public actors are fairly free)

We consider base-line scenarios (type 1) as being part of the given, the informational base that we elaborate our scenarios upon. They are, therefore, not presented separately but as part of the analyse concerning trends and driving forces according to the different themes.

In this report we present drafts for prospective and prospective policy scenarios. Such scenarios allow to raise awareness concerning the possible consequences of particular trend shifts and policy choices. They cover the following themes:

- Demography
- Transport
- Energy
- Economy
- Governance
- Enlargement
- Rural development
- Environment
- Social-cultural issues

Explanation of methodology

For each theme, we have elaborated a scenario base, a summary of all information necessary to elaborate future visions. This includes an overview of past and current trends, an identification of driving forces and a summary of existing baseline trend projections into the future.

The scenarios were then constructed on top of this foundation, in order to avoid that they are pure products of the imagination but rather scientifically sound. This does not mean that the scenarios represent the most probable future. Instead, we have drawn up plausible story lines that have a pedagogical character in that they explore some possible paths, often ignoring quite a series of interactions in order to keep the argumentation simple and understandable. In other words, these scenarios should not be understood as predictions of the future!

Several of the scenarios are built according to a system of axes defining two fields of policy choices and the four possible combination of these. Others have been built around policy options or particular trends which cannot be seen within such a continuum.

Overview of next steps in scenario building process (and the role of the present scenarios in that)

- finalisation of thematic prospective scenarios for July 2005
- elaboration of draft integrated prospective scenarios for TIR
- elaboration of draft normative, proactive scenarios for TIR
- dissemination and dialog concerning these scenarios (ongoing)

2.1 Demography

2.1.1 Scenario base

2.1.1.1 Main sources of information

- European Foundation for the Improvement of Living and Working Conditions
- The European Observatory on Demography
- ESPON 1.1.4
- Eurostat
- International Office of Migration
- Organisation for Economic Co-operation and Development Statistics Directorate
- Population Division, United Nations
- Population Reference Bureau
- The European Population Committee (CAHP), Council of Europe
- United Nations Economic Commission for Europe (UNECE) Population Forum

2.1.1.2 Present situation

2.1.1.2.1 *Current state of affairs*

On 1 January 2004 there were 380.8 million inhabitants in the EU and 74.1 million in the Acceding Countries (according to the first demographic estimates for 2003, published by Eurostat in June 2004). In the EU the population grew by 3.4 per 1000 inhabitants in 2003, due to natural population growth and net migration of +0.8 and +2.6 respectively, i.e. three quarters of the growth as a result of migration. On the other hand, and despite net migration (+0.4‰), the population fell by 0.8‰ in the Acceding Countries, due to a negative natural growth of 1.2%. The natural population growth in the EU (live births minus deaths) is expected to decrease from +309 000 in 2002 to +294 000 in 2003, and net migration should be also down, from +1 260 000 in 2002 to +983 000 in 2003. In total, the EU population is estimated to have increased by 1 276 000 in 2003. This is in line with the past few years, but still modest compared with growth in the 1950s and 1960s.

In a broader context, while the 'developed' world shares many aspects of population structure and distribution in common (reduced levels of population growth, counter-urbanisation etc.) Europe and Japan are losing populations, while the population of the USA continues to grow. According to data, accepted by the UN, the industrial regions of North America, Europe, and Japan have together about 800 million people. But while North America's population is expected to grow 30 percent to 384 million over the next 50 years, those of Japan and Europe together are expected to decline by about 10 percent. Currently in spite of net immigration from the rest of the world, the total population of Europe has become almost stationary, a situation referred to as 'zero population growth'. By contrast the rest of the 'developed world' has been gaining some 0.7% additional people per year, and 'LDC' (including China) an extra 1.5%.

Europe has, over the past three decades entered its 'second demographic transition' with populations failing to replace themselves which is itself a major driving force for change. Structurally then, there is an increasing proportion of old people which is likely to continue as the 'baby-boom' generations reach retirement age. Irrespective of how this phenomena is explained (post-industrial etc.), it is clear that the contemporary demographic behaviour in the EU is different to what it was 30 years ago and very different to what it was prior to that. The table below provides a picture of the current demographic situation across the EU (except Malta and Cyprus), depicting the generally very low rates of fertility and mortality and the widespread occurrence of natural decrease, though supplemented by net immigration.

According to Lutz et al. (2003) the turn of the century marked the 'critical phase of its demographic evolution' as the population began to generate 'negative momentum': a tendency to decline owing to shrinking cohorts of young people, brought on by low fertility (birth rate) over the past three decades. Currently, the effect of negative momentum on future population is small according to the Population Network (IIASA), but they predict that each additional decade that fertility remains at its present low level will imply a further decline in the European Union (EU) of 25 to 40 million people, in the absence of offsetting effects from immigration or rising life expectancy.

| | AT | BE | DK | FI | FR | DE | EL | IE | IT | LU | NL | PT | ES | SE | UK |
|------|------|--------|------|------|------|-------|-------|------|-------|------|------|------|------|-------|------|
| 2000 | 0.01 | 0.4(e) | 0.13 | 0.15 | 0.42 | -0.09 | -0.02 | 0.67 | -0.03 | 0.45 | 0.42 | 0.14 | 0.10 | -0.03 | 0.11 |

By 2003 the decline in Italy and Germany had accelerated. Of the 10 new member states all have negative rates, except for Malta and Cyprus. The rates in Eastern Europe are also now almost all in absolute decline, the sharpest fall being seen in Bulgaria. These figures may also be measured annually by '000 inhabitants, see below.

Source T1.3 Europe-wide comparative review, Council of Europe, 2004

Table 1 Current rate of 'natural population increase' (excess of births over deaths in the indigenous population in % – EU15 (average 2000, 1.8)

The one outstanding feature of the 'new' Europe in the sense of its population thus, is its low level of growth, and what this means for the region relative to the rest of the world. There are across Europe slightly more deaths than births, which had by 1995 produced a natural decrease of 1 per 1000 (birth rate 10 per 1000, death rate 11 per 1000). This correlation has been modified in that while the birth rate has plummeted, a long-term rise in longevity has suppressed the mortality rate producing an ageing population.

The possible consequences of this situation were written about in 1937¹, less than ten years before the first baby-boomers were born, when John Maynard Keynes, a British economist, predicted:

'We know much more securely than we know almost any other social or economic factor relating to the future that, in the place of the steady and indeed steeply rising level of population which we have experienced for a great number of decades, we shall be faced in a very short time with stationary or declining level'.

Although his timing was less than accurate, his predicted trend was right. We are witnessing the start of what the Japanese call the 'Silver Century' or what has come to be known more

¹ Cited in *The Economist*, 2004, A Survey of Retirement, 27 March, p. 18

popularly as the 'ageing of Europe'.

A recent presentation by the Population Forum of the United Nations Economic Commission for Europe (UNECE) which focused on the specific age structure of European demography, which differ from other parts of the world (including America), pointed out the following:

- There are increasingly 2 generations of retired persons (3rd and 4th generation, with 3rd generation sometimes acting as carers for 4th generation).
- Population analysis done by the INSERM show that the numbers of centenarians is growing exponentially.
- Today, the number of persons aged 60+ is greater than the number of children under the age of 15 and, by 2050, the number of older persons will be the double of the number of younger people.

The economic implications are generally perceived according to the current retirement ages and in terms of the 'potential support ratio', that is the number of people aged 15-64 per person over the age of 64. In 1950 this was approximately 8 in the EU by 2000 it had halved at 4 (these figures are considerably different to most other parts of the world, in South Korea for example, the figures were 18 and 11 respectively).

Mortality and Longevity

Van de Kaa (1987) called the record low rate of mortality in Europe the 'least trumpeted component of the second demographic transition'. It is certainly the most positive aspect, though it has been unfortunately presented too often in a negative way, due to the structural changes in the age distribution of the population that it is producing. Less has been written about the falling mortality rate than its outcomes and less about it than falling birth rates. Nonetheless this is a substantial achievement, the average life expectancy in the EU by 2003 was 75 for men, 81 for women, highest anywhere in the world with the exception of Japan. Similarly the infant mortality rate at (11 per 1000 life births is also low in relative terms).

Fertility

Current fertility rates and associated 'partnership behaviour' are central to the population debate in Europe. Europe now has the lowest level of fertility in the world, although the causal factors characterising this outcome are quite diverse, producing uncertainty about the future of the trend. The diversity in the birth rate relates to an increase in 'flexibility' in family formations and a reduction in the predictability of partnership behaviour. As Kiernan (1999) stated; 'men and women are cohabiting more, marrying later, becoming parents at older ages, and having fewer children, as well as terminating their marriages more frequently than was common in the recent past'. But whatever the reason, the trend in fertility across Europe has continued on its downward path so that by the mid 1990s it fell well below 'replacement levels' (adjusted down to 2.1 births per women with the current mortality rates), now averaging just 1.5.

Migration

Migration is much more significant numerically than either births or deaths. As Cuijsen (1996) has pointed out, 28 million people change address in an average year, including those moving in and out of the EU, much larger than the 4 million births and 3.7 million deaths recorded in 1994. Of course the net changes in the size of places' populations are far smaller than the gross movements might suggest, because migrants often take the place of people who have left. Nonetheless longer distance movements undeniably do produce significant changes in population 'profiles' where immigrants to an area differ in

characteristics, such as age and income, to out-migrants. Importantly the types and geographical patterns of migration, intra-regional and international have changed significantly in recent years.

With respect to basic population figures, international immigration to Europe has been fundamental to maintaining the EU's size. Intra-regionally, the situation is more problematic with some areas suffering severe difficulties resulting from de-population, while others become increasingly congested (it is this aspect of population dynamics that the findings of ESPON 1.1.4 focus most strongly on). But while this is the case at the 'mega' level, with peripheral regions experiencing most acute de-population, at a lower level, the long established pattern of urbanisation has been challenged by the effects of de-industrialisation and the emergence of new forms of 'counter-urbanisation'.

Unregistered immigration

It is not easy to give precise data on the nature and scale of unregistered ('illegal') immigration, but the European Commission estimates that there were some three million unregistered immigrants living in the 15-nation EU in 2003.

Unregistered (sometimes called 'illegal') immigration takes two main forms. According to unofficial estimates, at least 80 percent of unregistered immigrants use tourist visas to enter the EU and then outstay their three-month limit. It is thought that some 500,000 are absorbed this way every year [footnote: A Common Policy on Illegal Immigration, House of Lords Select Committee on the European Union, 37th Report, Session 2001-2002, HL Paper 187K]. The problem is that nobody really knows whether the flow of unregistered immigrants is going up or down. It is known, however, that the number of refugees claiming political asylum in the Union has slowed sharply over the past decade. Last year 384,530 people claimed asylum, against 675,460 in 1992.

A numerically much smaller (but more visible in the media) proportion results from the usage of cross-border migration networks, including the trafficking of people. It is likely that the closing of borders and restrictions on immigration have increased the role of unofficial networks and the profits made by mafia-style networks that traffic in human beings, including those that traffic women for the purposes of sexual exploitation. However, it shouldn't be forgotten that many migrants chose to enter these networks, often paying large amounts of money, as they see this as the only possible path for entry into the European territory.

For several years EU leaders have been promising a common policy for both illegal immigration and asylum seekers. Now that the Union (bar Britain, Ireland and Denmark) has scrapped passport controls for travelling within it, logic suggests that a common approach to controlling the EU's external frontier should be forged. Having different national regimes for asylum and naturalisation has also led to worries that illegal immigrants are 'asylum shopping', and to recriminations between neighbouring countries like Britain and France, and Denmark and Sweden. It is arguable that by opening up legal migration routes to meet identified labour shortages and developing a common migration policy the EU could help combat illegal immigration.

2.1.1.2.2 *Current territorial differentiation*

Despite differences in the rate of change and the factors believed to be behind them, mortality and fertility trends across Europe can be seen to be converging. However migration, as would be expected is impacting regions differently, and increasingly so.

Mortality and Longevity

For 2003 Eurostat estimated that the effects of population ageing would start to outweigh the decrease in mortality rates in the EU, with 3.74 million deaths, about 64 000 more than in 2002. The highest mortality rates in 2003 were registered in Denmark (10.7 deaths per 1000 inhabitants), Germany and Sweden (both 10.4‰). Ireland (7.3‰), with its relatively young population, is the Member State with the lowest rate, followed by Luxembourg (8.5‰). In the Acceding Countries, the highest death rate was found in Latvia (14.1‰), and the lowest in Cyprus (7.8‰). Consequently, the highest natural growth of the population was in Ireland (+8.3 per 1000 inhabitants), well ahead of the Netherlands (+3.8‰) and France (+3.5‰). Three Member States recorded a negative natural growth: Germany (-1.8‰), Italy (-0.8‰) and Greece (-0.1‰). In the Acceding Countries, there was a natural increase only in Cyprus (+3.3‰) and Malta (+1.8‰). The largest decreases were observed in Latvia (-5.2‰) and Hungary (-3.9‰). In Slovakia there was no change due to natural growth.

In more general terms, based on life expectancy at birth, there is a convergence of mortality rates across the EU, responsibility for which lies primarily with countries, such as Portugal, where mortality rates were significantly higher than the rest of the Continent half a century ago. Thus life expectancy, in Portugal, between the 1950s and 1990s increased by an impressive 14 years, while countries where it was already considerably above average, such as Denmark, have made smaller gains. Subsequently by the start of the Nineties the range in life expectancy at national level across the then EU-12 was down to 3.4 years, compared to 12.8 years forty years earlier.

But in Eastern Europe, particularly the CIS, mortality rates continue to be significantly higher than elsewhere and have actually increased, raising the gap between eastern countries and member states of the EU.

Fertility

The convergence in falling fertility has been more than complete in the sense that countries, primarily in the Catholic South, which have traditionally been characterised by large families, now average the lowest birth rates. Thus while the overall European figure standing at 1.5 children per woman, northern Europe is now the highest at 1.7, followed by western and eastern Europe at 1.4 and southern Europe the lowest at 1.3, something of a reversal of the relative positions at mid-century (Council of Europe, 1998). Ireland, which had held out against the trend until recent years has now also moved to a 'sub-replacement' level. Of countries in the North West Ireland's decline has been most spectacular, other countries, such as Sweden, experiencing a partial recovery in rates over the past 20 years. In Southern countries, higher birth rates (more than 2.5 children per woman) persisted until the early Seventies, but then fell steeply. In Central and East European countries birth rates remained fairly stable throughout the post-war period, but fell spectacularly after the communist period ended, falling most alarmingly in East Germany.

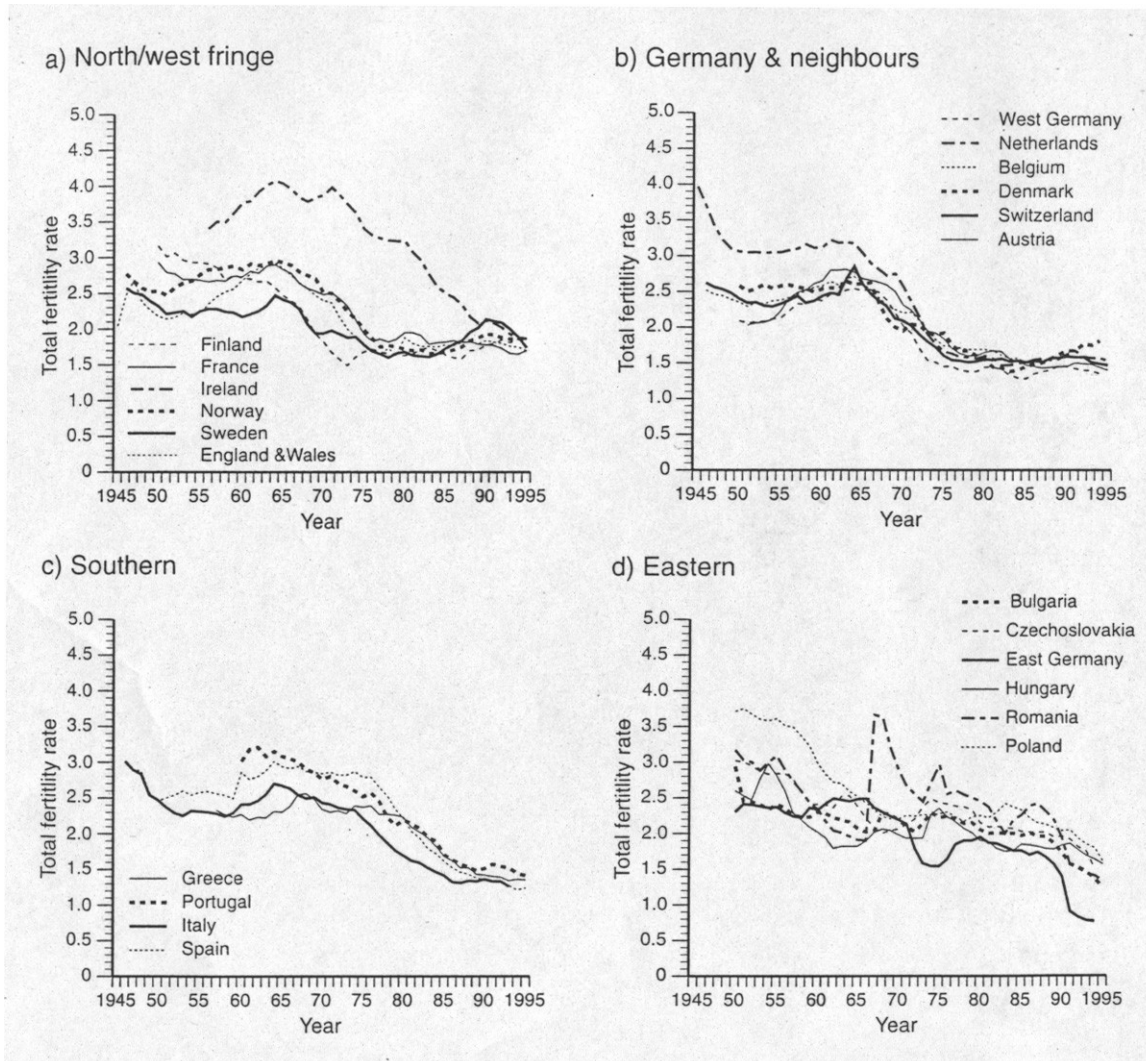


Figure 1 Total Fertility Rate by Region and Country

While births and deaths are slightly up in the EU, natural increase is still down. Live births in the EU are likely to have been 4.03 million, about 1.1% higher than the post-war low observed in 2002. The highest birth rates were recorded in Ireland (15.5 live births per 1000 inhabitants), France (12.7‰), the Netherlands (12.6‰) and Denmark (12.0‰). Germany (8.6‰), Greece (9.3‰), Italy (9.4‰) and Austria (9.5‰) registered the lowest rates. In the Acceding Countries, the highest birth rate was found in Cyprus (11.1‰, the only rate above the EU average of 10.6‰), and the lowest in Slovenia (8.6‰).

Migration

Net migration is responsible for over three quarters of the population increase. In 2003, more than three quarters of the increase in the EU's population came from cross-border migration. Spain accounted for 23% of all the net migration to Member States, Italy 21%, Germany 16% and the United Kingdom 10%. In relative terms, the largest net migratory flows were to Ireland, Portugal and Spain, with +7.0 per 1000 inhabitants, +6.1‰ and +5.5‰ respectively. The Netherlands (+0.2‰) and France (+1.0‰) had the lowest

migration rates. Without net inward migration, Germany, Italy and Greece would have seen a decline in their populations. In 2003, four Acceding Countries recorded more emigration than immigration, in particular Lithuania (-1.4‰), whilst the highest net migration rates were observed in Cyprus (+14.1‰) and Malta (+3.9‰). EU population growth in 2003 ranged between +0.1‰ in Germany and +15.3‰ in Ireland.

In summary, whereas the populations of all the Member States increased in 2003, the changes were notably different. The largest increases were in Ireland (+15.3‰), Spain (+7.2‰) and Portugal (+6.9‰), and the smallest in Germany (+0.1‰), Denmark and Greece (+2.6‰ each). However half of the 10 Acceding Countries, in particular Latvia (-5.6‰) and Lithuania (-4.5‰), had declining populations in 2003, whilst the biggest rises were in Cyprus (+17.4‰) and Malta (+5.7‰).

- International

The figures above show that it is the larger Southern member states that have seen a major change in international migration. Instead of being net exporters of people to north-west Europe and the 'New World' (as they were until the mid Seventies), they have become net immigration countries, mainly as a result of large inflows of migrants from Africa and Asia. While some of the latter are seeking permanent residency, others treat the area as a stepping stone to further movement within the EU. Spain and Italy are now the primary destinations for migrants from Africa, while Greece has been coming under increasing pressure from the Middle East and other parts of Asia (Champion, 1994). With respect to immigration from Eastern Europe, Germany has been the main recipient, initially. In the accommodation of asylum seekers, Austria and Sweden have made a significant contribution, relative to their population size, but less notable in gross terms.

- Internal

The extent and nature of the counter-urbanisation tendency across the EU is variable and there are different views about the strength of the trend. For example it is argued that in the UK net migration losses from London and other major conurbations peaked in the early Seventies, shrank for a decade then recovered in the mid-Eighties. In France, the trend continued steadily between the Seventies and the Nineties, but in other countries (such as the Netherlands and Sweden) there was something of a revival of urban concentration which began between those years. However it is far too simplistic to portray the de-concentration pattern as just a temporary phenomenon. The net migration from cities to peri-urban and rural districts continues and has specific features which mean that the resultant population redistribution impacts continue to be significant. (Details of regional spatial variations are given in ESPON FIR, 1.1.2)

Variation by region and region 'type'

Variation by region and country can be shown in that areas losing population as a result of natural population change and migration are broadly geographically defined, typifying East Germany, Scotland, Estonia, Latvia, the Spanish inland, Hungary, Romania and Bulgaria. Absolute population loss is also an issue in the Nordic countries, including large parts of Sweden and especially the Northern peripheries. Other areas however are gaining population, primarily as a result of migration. These include the 'MEGA' parts of Europe which maintain high demand for labour; Southern England, the Benelux countries, parts of Southern Germany and also Ireland and Southern Spain. Most of the European regions though are facing challenges with regard to population maintenance.

With respect to 'region type', population issues in Europe are frequently presented as a periphery/centre contrast with central European growth zones and with areas of declining population around the edges of Europe. This is certainly an important part of the picture,

and concerns with the implications of this are part of the rationale of the work of ESPON on polycentricity (see FIR, ESPON 1.1.1). Indeed some of the most geographically peripheral areas of the EU are identified by ESPON 1.1.4 as Type 4 regions (see Table 'Demographic typology of Regions' below), that is de-populating regions affected by population decline due to a negative migration balance and a surplus of deaths over births. Conversely there are 'zones of growth' which can be characterised as such as they are affected by a surplus of migration. Population growth can only be explained by migration because the balance of birth and death is negative or - in the best case - very small with regard to the natural population change. This is the case in parts of Germany and the Scandinavian countries, in Northern Italy and Southern England.

Another important variation portrays the demographic changes across Europe as an East/West contrast. This comparison is valid statistically and politically important in the context of the recent enlargement of the EU, the forthcoming accession to the EU of Romania and the relations between the EU and the CIS (see demographic references in FIR, ESPON 1.1.3). Much of the work on this aspect of population changes and movements stems from underlying concerns (from the West) of future migration from East to West. Issues in the CIS have focused on pockets of acute population decline and rural ageing populations. Here rural to urban migration (of younger people) and the loss of certain occupational groups are key factors. In summary, the population of the East is falling more than the West, although the population is younger to start with. But projected migration trends, and to a lesser extent actual migration trends indicate that East to West migration will not be sufficient to halt the demographic trend of a declining and ageing population in the West, and will accentuate the problems associated with de-population in many Eastern regions. Equally, it is estimated that enlargement will not change the ageing tendency of the EU, since although most new countries have relatively younger populations (due to higher birth rates in the 1970s and 1980s), the tendency towards a younger society will be limited and temporary².

However the picture is not as geographically straightforward as the Centre/Periphery or East/West models would suggest. There are pockets of population decline and growth in the same way that there are pockets of poverty and wealth in regions of economic decline and growth. The typology compiled by the 1.1.4 team is instructive in this respect. Using three key variables this measured natural population change (TFR and PN) and migration (PM) to classify the regions with respect to total population development (PT), on the basis of population changes and net migration between 1996 and 1999 (ESPON 1.1.4, FIR, Table 4.1 and Map 3.2). The work produced six combinations, and region 'types' as shown below. The typology is innovative both in encompassing both natural population change and migration and in showing the differing force of these two trends in different area 'types'. For instance, in areas typified by the South East of England, the population dynamic is increasingly driven by migration and less by the surplus of birth³.

² European Commission annual report on the social situation in the European Union, 2000.

³ The typology can be criticised however for implying that migrants are necessarily young people. Some tourist regions may have significant net immigration, but essentially of elderly people, although this is recognised in type 2 in Table 2 which doesn't specify the age of immigrants.

| |
|--|
| 1 In-migration and young population/'high' TFR |
| 2 In-migration but low fertility rate |
| 3 Out-migration but young population/'high' TFR |
| 4 Out-migration and old population/'low' TFR, depopulation |
| 5 In-migration and old population/'low' TFR |
| 6 Out-migration but still young population/'high' TFR |
| PT=Total population development |
| PM=Net migration |
| PN=Natural population development |
| TFR=Total Fertility rate |

Table 2 Demographic Typology of Regions

More than half of the regions – 52 percent – had a natural population decrease during the second half of the 1990s. 20 percent of the regions were expansive regions in the sense that they experienced a population increase as a consequence of net in-migration. This means that 32 percent were regions where natural population decrease was also combined with a net out-migration that accentuated the population decrease in these regions. These regions are in a problematic situation and can also be characterised as areas experiencing depopulation.

Thus what is important is that, in spite of regional variation, the general trend persists. The birth rate is falling, the total fertility rate now below replacement level, the mortality rate is also declining with substantial increases in life expectancy throughout Europe as a whole. This in the context of a world, whose population is growing exponentially. This means that Europe's share of the world population has been falling. Moreover though different 'European countries present different stages of demographic development... over the last thirty years the demographic differences between them have become less and less pronounced' (Council of Europe, 2001). It is true though that Central and Eastern European countries have, since the 1990s faced a combination of low fertility with life expectancy lower than that of the West, producing more serious levels of population decline. One which is not being mitigated by migration in the same way as it is in Western Europe. It remains to be seen how much this demographic divide is of a transitory nature and the extent to which EU policy may impact it.

| | AT | BE | DE | ES | IT | UK | BG | EE | LT | MT | PL | RO | SI |
|---------|-----|-----|------|-----|------|-----|------|------|------|-----|------|------|------|
| Natural | 0.0 | 0.6 | -1.8 | 1.7 | -0.8 | 1.4 | -5.9 | -3.7 | -3.0 | 1.8 | -0.2 | -2.6 | -1.0 |
| Total | 3.1 | 3.9 | 0.1 | 7.2 | 2.8 | 3.2 | -5.9 | -3.8 | -4.5 | 5.7 | -0.6 | -2.6 | 0.8 |

Half of the new member states were showing a total fall in population by 2003, but in the case of the Czech Republic, Slovakia and Slovenia immigration was preventing an overall decline.

Source: Eurostat European population trends, 04/6

Table 3 Natural population increase: Total population increase (by '000 inhabitants – selection of EU29 (average 2003, 0.8: 3.4)

2.1.1.2.3 Existing EU policies

The inter-relationship of other policy spheres with population dynamics is complex. Thus one recommendation from the 1.1.4 team was that governments should respond to demographic change and to potential labour shortage with different policies and instruments, depending on the needs of each country or region in relation to variation in the perceived problem of falling and ageing populations.

It is important to keep in mind that with regard to demographic development it is easier to see the policy implications than to make policy recommendations. Demographic processes are not analogous with other social and economic processes that more easily can be handled by political and economic means. Especially with regard to migratory movements and international migration, rules and regulations can have an immediate effect on the future demographic development. Natural population development is, however, a more complex phenomenon. If wars, famines and other catastrophes are excluded, death rates will probably not be changed in a way that has impact on natural population development in the long run even if life expectancy increases. Instead it is the total fertility rate that is the crucial and central variable here, but the effects of changed TFRs are of long term character. Different parts of Europe have also differing attitudes to family policy and welfare state interventions in the private space and with regard to female labour force participation. The consequence of this reasoning is that it is easier to get a hint of the implications of the demographic development than to make any policy recommendations that will have any immediate impact (ESPO FIR, !.1.4).

Policies specific to areas of depopulation

WP4 of 1.1.4 was geared to the particular problems of areas suffering depopulation and concluded that it is often a function of low fertility rates, natural population decrease and net out-migration. For many depopulation regions this results, 'in vicious circles that erode the preconditions for endogenous growth and development'. From a policy point of view this is problematic as many of these regions have long been out-migration regions and policy means have not succeeded in changing this negative spiral. These development paths, however, are undesirable from a cohesion point of view even if there can be conflicts with regard to the growth perspective. This dilemma is of great importance with regard to the EU cohesion policy. The concept of territorial cohesion is a central ingredient in ESDP/ESPO and a policy that reduces the eventual goal conflict between growth and territorial cohesion where lagging and depopulation regions are stimulated – but not on the cost of economic growth and competitiveness – must be discussed explicitly among politicians and policy-makers and not be a topic only for 'regional economists'. Otherwise, the depopulation of many areas will continue and if this is the case, the welfare state must intervene in the sense that it will be a 'civilised depopulation'.

Mortality, Longevity and policies related to an 'ageing population'

Recent proposals from DG Employment and Social Affairs now stress a 'life cycle approach' to maintaining the EU's competitiveness in order to realise the Lisbon Strategy (op de Beke, 2004). This follows the revision of the employment strategy in 2003. The dual approach to the issue of the ageing population is to extend the working life and promote health into later life to support this. It is proposed that retirement age should be increased by an average of

five years and that the participation of older workers is encouraged in a general sense by restructuring work to be more accommodating to the needs of older workers. The gender dimension of ageing has also been discussed by the Commission. According to their estimates, 2/3 of the population of the EU over the age of 60 are women, and 4/5 of those over the age of 80. It is essential therefore, they argue to prevent poverty and poor health among older women. There are obvious financial incentives for such a policy and the Economic Policy Committee have also investigated the implications of an ageing population specifically in terms of future impact on public finances. In a joint Commission-Council report (The impact of ageing populations on public finances) to the March 2001 European Council in Stockholm, the authors outlined a three-pronged strategy to address the economic and budgetary consequences of ageing populations, i.e. reducing public debt at a fast pace, raising employment rates especially amongst women and older workers, and reforms of pensions and health-care systems including appropriate recourse to the funding of public pensions. The European Council in Stockholm also agreed that *'the Council should regularly review the long-term sustainability of public finances, including the expected strains caused by the demographic changes ahead. This should be done both under [the broad economic policy] guidelines (BEPGs) and in the context of the stability and convergence programmes.'* An initial assessment indicated that unless current policies are changed, there is a risk of budgetary imbalances emerging in many Member States. The Barcelona European Council of March 2002 invited *'the Council to continue to examine the long-term sustainability of public finances as part of its annual surveillance exercise, particularly in the light of the budgetary challenges of ageing.'*

Migration

Policies at the EU level are generally restricted to limiting the number of immigrants from outside the EU, policies which have resulted in allegations of a 'Fortress Europe' mentality. While the role of immigration in replacing falling populations has been the subject of much discussion, this has not resulted in formal policy initiatives specifying the type of migrants or final destination preferred in the sense that, for example, Australia has. Despite this, population maintenance in most Western European countries has been a result of immigration. Surprisingly then, while the conclusions of project 1.1.4 include the observation that the 'European immigration needs' are significantly more urgent in the (then) Candidate Countries (EU12) than in the former 15 member states, and that destination of the immigrants needs to rise up the political agenda, there is a warning that increased migration to the EU is not a panacea to demographic problems. 'An increased immigration would certainly have an immediate impact on the working-age population. However, in the long-term, migration is not a solution to the population ageing, because immigrants themselves age, and need be replaced. Furthermore, although the fertility rates of immigrant women are higher compared to native women, the fertility level tends to converge in the long term'.

The issue of internal migration has greater implications for the objectives of the ESPON programme, in particular balanced spatial development, and its causal factors are often primarily demographic in nature. Put the other way round, *'one of the central aspects of demographic changes is that it has consequences on regional and spatial development that are central for sustainability, competitiveness, cohesion and polycentrism. Regions characterised by depopulation are often associated with stagnation and retardation, while regions that experience a positive population development are regarded as expansive and dynamic'*. As a consequence demographic development with population redistribution as a result of natural population decrease and low TFRs, ageing and out-migration contributes to the polarisation process between various regions. The main policy implications in the ESDP/ESPON context, are that these processes also hamper the development towards a polycentric development in Europe and reinforce the mono-centric tendencies at the macro level.

Consequently, according to part of the 1.1.4 analysis, both the EU regional development policy as well as national policies must begin to prioritise an economic and social policy (family policy) in order to stimulate a rise of the TFRs. This will be required to stimulate the preconditions for endogenous growth that probably will result in higher TFRs. From a cohesion point of view this is important if the risk for future concentration and social exclusion is to be avoided. As much social policy, especially family policy (where it exists) is still determined nationally, co-ordination within the EU would be useful in order to increase the TFRs. This means also that politicians and policy makers must be aware of the effects of 'demographic cycles' and their impacts on regional and spatial development and see these processes in a long wave perspective in order to separate short and long term effects.

At a broader level, as educational and income opportunities are key to intra-European migration, reducing regional and national differences, should lead to more balanced migratory movement, promoting a more symmetrical economic development in the EU29-area. Furthermore, reducing the regional and national differences in income and education will be an effective means to promote a polycentric development and even stimulate symmetrical migration flows even within different age groups and social categories. Regional enlargement with larger local labour markets and functional urban areas will also stimulate a polycentric development where perhaps the infrastructure and accessibility will be even more important and a precondition for, and a 'driving force' in this development.

To close the gap in living standard and income levels then, is thus of utmost importance to create a polycentric development on EU29-level. The gap between the new EU members and the old ones are much more pronounced than the gap within the various countries. Temporary rules and regulations are perhaps in some cases necessary in order to hamper a short term large drain from east to west – the fear of mass migration are probably overvalued - but this is not a solution in the long run. Instead a policy that stimulates symmetrical migratory movements should be of great importance and prioritised on the political and social agenda.

General policy options

The European countries do have the possibility of improving labour productivity and labour force participation rates, across the age spectrum, which will lower the need for immigration. Project 1.1.4 suggest that national governments should respond to demographic change and to potential labour shortage with a variety of policies and instruments, depending on the specificity's of each particular country or region. They present five broad categories of available interventions:

- Encouraging higher workforce participation through retraining of the unemployed, discouraging early retirement, increase female activity rate, by making it easier for women to combine work with childcare
- Postponing retirement ages, a process facilitated by longer active lives
- Improve labour productivity levels, by increasing capital investment and promoting the development innovation both in technology and organisation capacity
- Immigration policies
- Encouraging an increase in fertility

There is also an assertion that it is important to distinguish between short-term from long-term policy responses to a labour shortage. Immigration can only offer a short-term solution to the consequences of ageing.

There are less recommendations at the EU level, as demographic and migration policies are

still the preserve of national governments despite attempts to co-ordinate them. However the conclusions recall that different levels of income and education are key push and pull factors in all migratory movements. Therefore the broad recommendation at the EU level must be to reduce such regional and national differences and increase the symmetrical economic development of the whole EU27/29 area.

2.1.1.3 Trends and identification of driving forces

The main trends in the population situation in Europe has been usefully summarised as follows:

Demographic trends include natural population trends (births, death, age structure), migration on large scale and regional/local migration. The latter is of particular interest as peer groups tend to differently migrate. Another observation is that the attitude and migration of cohorts is changing over time. That relates, in particular, to the third age. Those demographic trends together with migration and increasing mobility cause severe effects on the territorial development and the division of labour between regions. Trends could be distorted by the enlargement of the EU where additional movements are expected (Final Interim Report, Introduction, 1.1.4).

The key demographic trends in Europe are thus:

- Natural population change
 - mortality rates (falling) producing increasing longevity/life expectancy
 - fertility (birth rate) (falling)
- Migration (within and between European countries)
 - Long-distance within (sinking volume)
 - Short-distance within (high intensity)
 - International within (quite low, but East to West flows)
 - International to European countries (high potential and demand)

Consequential trends specific to particular areas:

- Depopulation (& relation to fertility and migration)
- 'Replacement migration' (focus on labour shortages and ageing factors)

The first two trends contribute directly to the size or level of population in and within Europe, as well as the composition or structure of the population and are universally significant to varying degrees (In the EU, natural population change is currently producing on average a 'falling and an ageing population', while migration is maintaining overall population levels, in many - but not all - parts of Europe). In terms of the position of the EU vis a vis the rest of the global economy, these general trends are most significant.

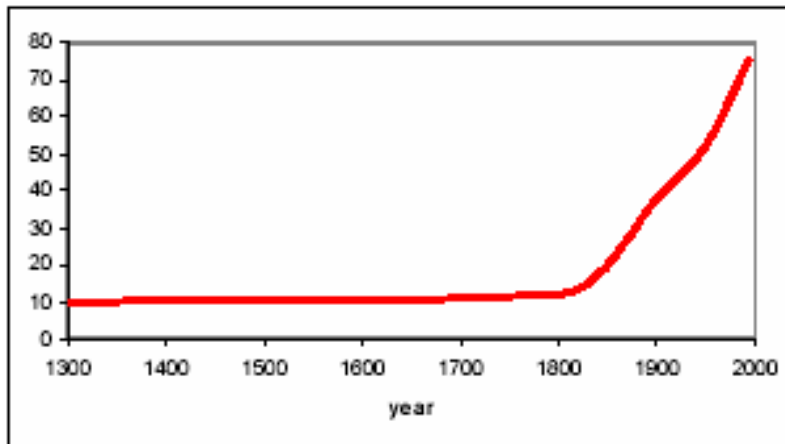
Depopulation and 'Replacement migration' are consequential, a product of the primary trends and variably significant in different parts of Europe. For the objectives of ESPON (reducing inter-regional disparities etc.) the variation in these trends is most important.

2.1.1.3.1 Past trends (long-term trends, but also recent changes in trends)

Long-term

Long-term demographic developments dating back from the beginning of the nineteenth century, as shown in the diagram below, have been described as the 'first demographic

transition’ marked by sharply rising population. Increments in longevity in the first half of the twentieth century led to a substantial increase in life expectancy. Although the curve looks fairly continuous, there were significant fluctuations which related to the world economic crises in the 1930s and the Second World War. The two years following the War are often depicted as the ‘baby boom’ years in which fertility retained unusually high levels. But the end of the Sixties marked the beginning of a sharp downward trend. Despite this picture, which is specific to Europe and Japan and a reversal of the rapid rate of growth experienced in Europe since the late 18th century⁴ and most of the rest of the world since the 1950s⁵, the European ‘demographic landscape’ does show variable levels of population change.



*Data source: Huriet and Thisse (2000, p. ix).

Figure 2 Share of urban population in Europe

Recent changes in trends

- Mortality and Longevity

The increase in life expectancy has been a more continuous feature of recent European history than the more recent and rapid fall in fertility. Still the overall rise over the past half century has been substantial, though arguably there is further scope for improvement. Moreover male/female differences in life expectancy are now wider than they have ever been. The trend has been destabilised by the spectre of AIDS creating a element of uncertainty about the future. This emphasises the role of personal behaviour and lifestyle choices on the continuation of this trend, rather than the more (planned) predictable advances in healthcare and economic advancement.

Overall life expectancy at birth has been lengthened by nine years across the EU since the early Fifties, representing an average gain in longevity of one year every four years (Noin, 1995). This progress has not been completely regular, being most rapid in the early post-war period, slowing in the late 1960s but then resuming a steady increase since the mid-1970s.

There has also been a marked decline of infant mortality over the past fifty years, since the early 1950s in the 12 pre-1995 EU countries it has been falling by around 5% a year on average; from 49 per 1000 live births to 8 at the end of the 1980s.

⁴ Due largely to improved public health and control over infectious diseases

⁵ Global population 2.5 billion in 1950, 5.3 billion in 1990 estimated to rise to 8.5 billion by 2025

Despite territorial differences, these improvements in life expectancy have been associated with a clear convergence, due mainly to the fact that the largest increases have been in the countries where life expectancy was originally lowest, see '*Mortality and Longevity*' in section 2.1.1.2 (However the situation in eastern Europe, outside the EU, has diverged since 1989 with an increase in death rates.)

In summary life expectancy at birth has risen from 67 years in 1950-1955 to 76.5 years in 1990-1995. Consequently, the proportion of 65+ rose from 9.5% in 1950 to 15.5% in 1995 and the potential support ratio (no. of people aged 15-64 for each person 65+) fell in the same period from 7 to 4.3.

- Fertility

The total fertility rate in the 15 countries that constituted the EU, prior to the 2004 accession, was on a rising curve until 1960-65, when it attained 2.69 births per woman. Since then, fertility has constantly decreased, falling below the replacement level of 2 children per woman around 1975. By 1990-95, it stood at 1.5 births per woman.

| | AT | BE | DK | FI | FR | DE | EL | IE | IT | LU | NL | PT | ES | SE | UK |
|------|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|------|------|------|-----|
| 1960 | 2.7 | 2.6 | 2.6 | 2.7 | 2.7 | 2.4 | 2.2 | 3.8 | 2.4 | 2.4 | 3.1 | 3.2 | 2.9 | 2.2 | 2.7 |
| 2001 | 1.3 | 1.5 | 1.7 | 1.7 | 1.9 | 1.4 | 1.3 | 1.97 | 1.2 | 1.6 | 1.7 | 1.46 | 1.26 | 1.57 | 1.6 |

Source T3.3 Europe-wide comparative review, Council of Europe, 2004

Table 4 Total Fertility Rate – EU15 (average 1960: 2.7, 2001: 1.4)

- Migration

The key driving force affecting population size and structure which is classified as due to 'artificial' or 'external' factors are population movements either between regions of Europe (intra-European migration) or to and from Europe (inter-European immigration and emigration). Migration from outside Europe could be the key to maintaining population levels, but political factors mean that migration from outside the EU is unlikely to be allowed to be used explicitly as an instrument of population adjustment. Intra-European migration could, and is radically affecting the demographic make up of different areas.

European growth zones are affected by a surplus of migration. Population growth can only be explained by migration because the balance of birth and death is negative or - in the best case - very small with regard to the natural population change. This can be observed in Germany, in the Scandinavian countries, in northern Italy and southern England. In these areas the population dynamic is more and more driven by migration and less by the surplus of birth. Some European peripheries are, however, affected by population decline due to a negative migration balance and a surplus of deaths over births (ESPON FIR, 1.1.4).

International

White (1993) refers to the emergence of a 'post-industrial' pattern of migration over the past couple of decades, which is characterised by the latest of three 'waves' affecting post-war Europe, following the 'guest-worker' phenomena of the Fifties and Sixties and the subsequent family reunification. This new wave is comprised of three elements: high-skill labour migration, clandestine movement (i.e. through illegal entry or after the expiry of a

short-term student, tourist or work visa) and asylum seeking. Numerically, and in terms of visibility, the latter two categories are more significant.

As regards the source of immigrants to the EU, there has been a marked change over the past 20 years. The proportion coming from other developed parts of the world has receded, in its place there has been a steady increase in migration from Asia and sub-Saharan Africa, reflecting the immense demographic and economic gulf between Europe and most of the Third World (Findlay, 1996). Another substantial source of immigration to the EU has been the more immediate South and East. In 1989 alone 1.3 million people entered the EU from former Warsaw Pact countries. But despite fears of a continued 'flood' from East to West, the move of peoples has eased since then (though within Eastern Europe large-scale movements of populations continue). In 1990, of the (registered) 13 million foreigners living in the then EU-12, 8 million were from outside Europe, with nearly half of these from North Africa and Turkey. Of those of European origin, a large proportion came from the former Yugoslavia.

(Destination of migration, see 2.1.1.2.2)

Internal

In the years immediately following the end of the War intra-regional population movements in Europe were still dominated by rural to urban migration. Between 1950 and 1970 the proportion of the urban population grew from 56.2% to 66.6%. Subsequently the trend persisted, though at a much slower rate, reaching 73.4% in 1990 (Champion, 1995). This overall slowing down reflected differential geographical changes. By the 1960s this trend had started to wane in the north-west and Italy, and within a decade in parts of southern Europe. By the Seventies counter-urbanisation, or other forms of 'de-concentration' became more pronounced in many areas and looked set to continue, at least for the growing numbers of retired people, higher income flexible and home-workers able to live away from their sources of income. But despite continued developments in the 'information society' and in selective migration from urban to rural areas, there has been something of a 'big city rebound' in certain city regions. Nonetheless the 'traditional positive relationship between net migratory growth and city size' had been fundamentally weakened, and in some cases had been replaced by a negative one. Furthermore, the new tendency for people to locate themselves down the 'urban hierarchy' has contributed variously to hope for a more polycentric Europe (see ESPON, 1.1.1).

In general terms the total volume of internal migration has been falling over several decades, especially over long distances. Reasons for this include children leaving parental homes later, reduced mobility among the ageing population and substitution by increasing daily migration.

2.1.1.3.2 *Driving forces behind the trends*

Mortality and Longevity

- Improvements in health care, access to health care and advances in medical treatment (Approximately 1 in 10 Europeans employed in health care in some way)
- Lifestyle factors, such as good work conditions (recent European Commission research indicated that jobless people have a mortality rate five times that of people in active work) and education

Fertility

Sensitivities about population densities and distributions mean that differences among EU member states' fertility rates are considered a major issue with important long-term consequences, likely to accentuate existing differences between geographical regions and functional regions. These differences may be related to the countries' cultural, economic and social specificities but also to variations in the degree of preoccupation concerning declining birth rates in each country. Although falling birth rates have been associated with industrialisation and growing affluence, this is equally the case in southern European countries that now have the lowest fertility levels in the European Union. Other variables include: social support and other public policies en/discouraging family size; religious factors (but note the so-called 'Southern European paradox' (*lack of religious acceptance of contraception in Catholic countries but fertility rates in Italy lowest, followed by other Southern countries and Germany*)); employment and 'burden-sharing; female careers between employment and children; intra-household division of child-care and income etc (i.e between men and women) and how such factors may affect the decision to have children; 'fiscal welfare', tax relief, child benefit (universal/selective etc.), availability of extended family and other informal networks of support, changing values; public opinion and the role of the media; government family policies⁶.

Many of the explanations for the falling fertility rates have tended to group around economic, social or cultural lifestyle type factors. Such include the following;

- Economic – Consumerism, competitive conditions and cyclical recession pressures leading to delays, or the decision not to start families.
- Socio-economic – The large rise in the proportion of working women, not followed by increase in public child care facilities.
- Social – A decline in collective, familial or community values and an increased stress on individual fulfilment.
- Social/health – Increased availability and acceptability of forms of contraceptive methods, easier access and a rise in societal and medical acceptance of termination (abortion).
- Cultural – Shift in partnership arrangements, reduced permanency of marital relationships – (children of single or divorced mothers less likely to have siblings) a move towards serial monogamy as the norm and a rise in cohabitation. An increase in the mean age of women at first marriage and at production of first child.

2.1.1.3.3 Migration

International

- Persistent gulf in living standards and opportunities between EU and 'donor' countries.
- Previous migration leading to family re-unification

⁶ Japan, which now has the lowest birth rate in the world, instituted the first modern official birth control policy after World War II, followed by several other countries. Since the 1950s however most European members states have introduced pro-natalist policies of varying strengths, most offering fiscal and direct state financial incentives

- Links between donor countries and some EU countries due to earlier colonisation
- Unemployment
- Higher education opportunities

A report by the European Foundation for the Improvement of Living and Working Conditions in 2004 shows the dangers of oversimplifying reasons for migration and points to the country specific factors (see section 2.1.1.3.4 below), nonetheless unemployment as a push factor and higher education as a pull factor were unifying features.

Internal

- Post-industrialisation and economic re-structuring
- Increased work flexibility and decentralisation
- Advances in Information Technology allowing home-working
- Greater variety of lifestyles
- Post-materialism
- Quality of life considerations in moves out of congested and deteriorating zones
- Retirement migration, portable pensions and an increase in home ownership allowing more freedom in intra-regional/urban to rural migration
- Cohabitation, divorce and remarriage leading to more frequent residential mobility
- Young people leaving home, not to marry but to pursue extended education or employment away from home communities
- Families with children moving further away from city cores as commuting becomes easier
- Economic pressures to move away from expensive urban centres
- A steep rise in car ownership
- Increase for some of economic freedom to move to 'sunbelt' zones and more attractive areas

Flows within countries still reflect economic gaps between regions. In the UK, the strongest migratory flows are to South, showing the relative dynamism of the London area. Approximately 90% of that migration is made up of younger people. A similar situation is apparent in Italy (South to North) and Germany (East to West). In Eastern Europe the model is also straightforward, the metropolitan regions (in all cases mostly the capital) are the attractive regions whereas rural isolated regions (eastern Poland for example) and industrial regions (such as Silesia) have negative migratory balances. But inside metropolitan areas, all centres have a rapid suburbanisation process. Area types attractive to young people are generally large, urban and dynamic with a high demand for labour, those unattractive to them are suburban and less dynamic areas.

Intra-European flows have also been largely age related, since the mid-Nineties the movement of retired peoples from North to South Europe has intensified, still compensated by a persistent, but more limited flow, of young people from the South to the North.

2.1.1.3.4 Driving forces of territorial differentiation

'When we look across the Union we see that those countries that have experienced a rebound in fertility rates are the ones that have managed to combine good employment opportunities for women with care provision policies such as parental leave and after-school-support for children. These successful countries have also achieved a more equal gender division of household and caring responsibilities. The study of the gender dimension of life-cycle-time-use will bring new evidence and will raise our awareness of this critical policy issue' (op de Beke, 2004).

Despite this statement, which reflects the partial recovery of fertility rates recently in Northern European countries with stronger welfare provision, there has been, in the longer term, something of a convergence in fertility and mortality rates. This is not the case with migration however, where there has been considerable variation, thus in this section the focus will be on the differences in driving forces with regard to migration across the European Union, specifically regarding the movement of peoples from East to West.

According to the European Foundation for the Improvement of Living and Working Conditions, the typical migrant from the acceding countries is young, well-educated or studying in third-level education and living as a single, non-cohabiting person. An increasing number of migrants are female. The study revealed the following. The sending countries face the prospect of a major 'youth drain', in the region of 2%-3% of the youngest age category. In Bulgaria and Romania, it may lead to an outflow of nearly 10% of the youngest age group in the next five years. The potential youth drain is combined with a potential 'brain drain'. The sending countries are in danger of losing between 3% and 5% of people who have achieved third-level education, and more than 10% of their students. These figures represent the wider migration potential. Looking at the 'firm' intention to migrate, there may be a 'brain drain'.

Gender and Marital Status

Recent hypotheses of an increasing feminisation of migration are confirmed. Looking at the wider migration potential in the Czech Republic, Hungary and Slovakia, a greater proportion of women among the female population expressed a general inclination to migrate than did men among the male population. Conversely, in Bulgaria, Poland and Turkey, the male percentage of migrants per male population is higher than the female percentage per female population. There are clear signs of an accelerating trend over time. Women have a less economically pronounced motivation for migration than men. Unsatisfactory housing conditions play a minor role but gain an increasing importance for those expressing a firm intention to move and for female migrants. Family and other social reasons are less important, but their relevance increases in some quarters, particularly for potential female migrants of the richer acceding countries. This group is also strongly motivated by poor current housing conditions.

Married people are less willing to migrate. The main migration potential consists of single people.

Employment

Jobs and financial motives are the dominant rationales for migration, which is supplemented within the IOM study by the objective to enhance living conditions. Unemployment has an influence on migration, but to a much lesser extent than predicted and only in a limited number of countries. Overall, 2% (expressing a 'firm' intention) of unemployed people want to migrate. The strongest push due to unemployment is in Turkey, Bulgaria and Estonia.

Education

Medium and, in particular, higher education strongly influences migration. Higher education is a pull and facilitating factor. It acts as a pull in the prospect of improved income in the potential target countries and it facilitates search and information behaviour, as well as reducing uncertainty. It has a role in explaining the 'feminisation' of migration, with improved educational levels among young women from Central European countries.

Country specific motives for migrating

The key fact of the study from the point of view of territorial differentiation is its agreement with the resumé of the International Organisation for Migration (IOM) 'that there is no single explanation for migration potential but rather a combination of explanations, which depend upon the country under consideration and the kinds of migration which occur'. However, there are some overall trends. As expected, the rationales for migration are widely diverse among the 13 countries. They include a balanced social and economic rationale (Czech Republic, Latvia, Slovenia), a balanced employment and financial rationale, an overwhelming short-term financial motivation (Bulgaria, Romania), and a predominantly family orientation (Cyprus, Malta). Higher economic development goes hand in hand with an enhanced importance of family and personal motives. Turkey shows that high and low income has a strong and significant influence. Perceived economic strain also plays a strong part in the willingness to migrate. There is a cumulative pattern of influence on migration, which combines objective and subjective factors. The Polish emigrants, however do not see income and income differentials as the main motivation for migration. In fact different causal patterns were identified in Poland and Turkey. This result reaffirms the strong influence of country specific effects, which are being increasingly considered in econometric models of migration.

What is significant demographically about these findings is that reasons given for emigration to established EU countries are gender and age specific, within each of the 'donor countries'. If the gender/age balance of immigrants is different to that of the host country there will be demographic changes to the host country, as well as the 'donor' country. This is clearly significant in light of the ageing issue of European countries. The additional future factor, not reviewed here, will be differences or harmonisation of EU member states immigration policies.

Intra-regional migration, ageing and social polarisation

From a cohesion point of view this is a problem in terms of future concentration and growing social exclusion. At the national level, the ability of retired people to choose where they want to live has led to an urban-rural shift in countries such as Britain (where 86% of rural districts have gained population by migration since 1991, half a million alone in the 5 years between 1991 and 1996 in spite of the continued out-migration of (mainly young) rural residents). These statistics are at the upper end of the range, but typify the counter-urbanisation trends now dominant across parts of North West Europe⁷. In the UK, the relocation of older people to rural area is a major component of a wider urban-rural shift. One implication has been the rise in house prices and the squeezing of the local young people out of the rural housing market. These trends are summed up in the UK's Rural White Paper (DEFRA, 2000)⁸ as follows:

⁷ In France, Germany and Sweden there have been new rural-urban flows since the end of the Nineties due partly to restructuring in public services.

⁸ DEFRA, 2000, UK's Rural White Paper, London: DEFRA

'A hundred years ago, the countryside suffered from depopulation as younger families left rural poverty for better opportunity in the cities...Nowadays, due to immigration, the population of rural districts is growing twice as fast as the national average. But many of the newcomers are older and wealthier and can outbid rural residents, with their lower than average incomes, in the competition to buy homes. With less social housing available as right to buy has taken effect younger people have less opportunity to find affordable housing. These trends are changing the character of communities in some parts of the country – leading to polarisation and social exclusion.' (para 1.4).

According to an 'ageing vulnerability index' produced by the CSIS and Watson Wyatt consultancy, France, Italy and Spain are most vulnerable to the rising costs of old age, while Australia, the USA and Britain are least vulnerable⁹. Making the retired and soon-to-be retired make adjustment will be the greatest challenge faced in social policy by European politicians.

Older people are particularly active in participating in local and national elections, whilst young people are more likely to be reluctant to take part. Changes in state benefits for pensioners will be faced with major oppositions from old people and will confront the government with the risk of losing the election afterwards. When retired people outnumber younger voters, their 'grey power' can determine the spending priorities of local governments for example away from schools and towards health services. This can lead, if unchecked, to 'age conflict', with potentially serious implications. Furthermore, the spending patterns of older people have major impact on the growth or otherwise of certain industries such as the tourist industry. The Hakuhodo Institute in Japan found that for a third of Japanese 50-60-year-olds, overseas travel is their favourite activity, with Italian cities, Paris, London and Vienna at the top of their list¹⁰. In many European countries the fastest growing demand for holiday travel comes from over-60s.

2.1.1.4 Future trends

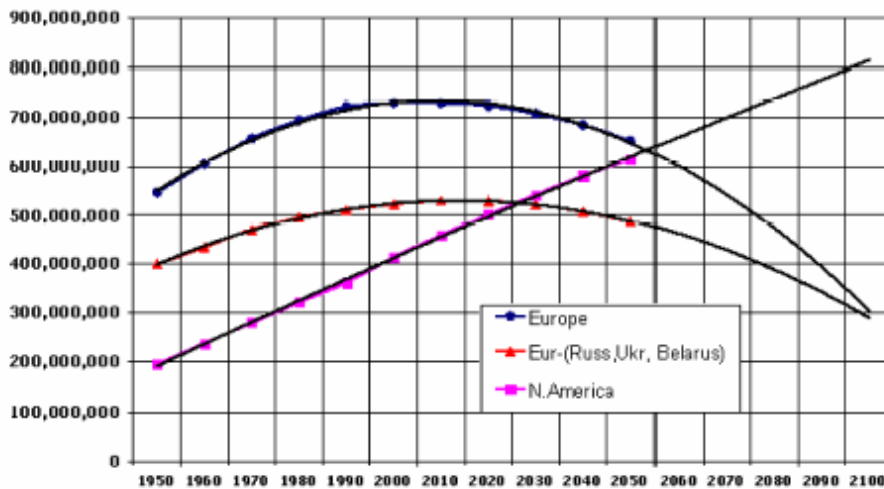
It is important to note that the predictions are associated with a high degree of uncertainty, as previous attempts to forecast have demonstrated.

2.1.1.4.1 Existing quantitative projections

The Population Reference Bureau (PRB) calculated that between 1996 and 2010 Europe's population would be maintained, largely as a result of declining mortality and migration by 2.3%, but would fall between 2010 and 2025, assuming a continuation of current trends, by -0.3%. This compares with an average across the rest of the 'developed world' of 10% (1996-2010) and 8% (2010-2025), and for LDC of 25% (1996-2010) and 21% (2010-2025). The consequences of such projections are a continuation of the declining European element of the global population. The PRB predicts that by 2025 Europeans will account for one in 16 of the world's population, down from one in 6 in 1950.

⁹ *The Economist*, 2004, A Survey of Retirement, 27 March, p.18

¹⁰ Quoted in *The Economist*, 2004, A Survey of Retirement, 27 March, p.9



Source: Cloet, R.L. Population Statistics, Bath, UK, March 2003

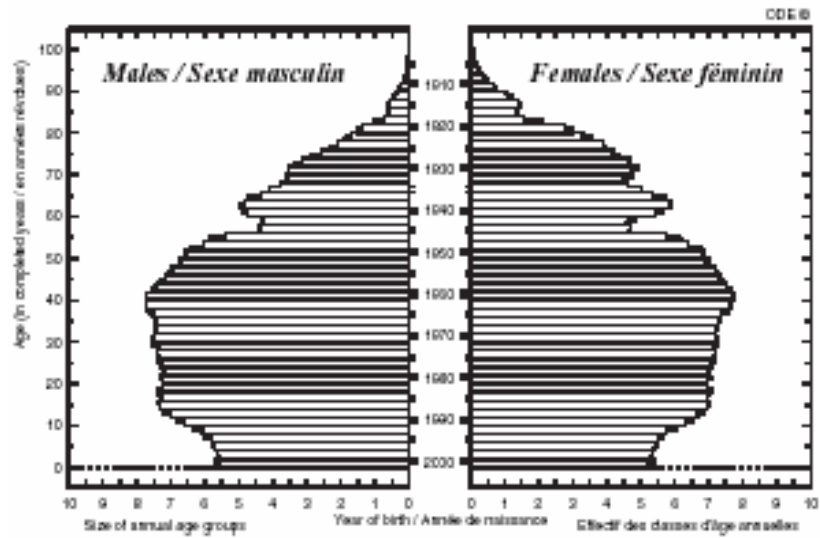
Figure 3 European and North American population trends

Mortality - Projections, age-pyramids and the 'dependency ratio'

Current projections assume a continuation of present trends, as nothing to date indicates that there is any foreseeable variable, at this point in time, which will make any notable impact on population size and structure.

Excluding the migration factor, the most interesting dynamic to many socio-economic policy makers and planners is the ratio of young to older persons. Already the proportion of older people is higher than the proportion of the young (under 15) in several European countries, including Bulgaria, Germany, Greece, Italy, Portugal and Spain. The majority of European countries now have percentages of persons over 65 of at least 15%. The so-called 'old age dependency ratio, is calculated as the number of retired persons (average 65+) per 100 persons of working age. 25 is often mooted as having reached an 'unacceptable' rate in purely economic terms. In Italy the ratio reached 27.1% in 2002, in Sweden 26.6% and Belgium and Greece peaked the 25% mark. There is of course also a young age dependency ratio, calculated in more 'expensive' terms as 40 or more persons under 15 years of age per 100 persons of working age. Despite the more intensive 'care input' for younger citizens, this ratio is falling now in most European countries. One extreme exception is Albania (51.7%), which also has the lowest proportion of older (+65) people (6.7%). The overall, or 'total dependency ratio (TDR)' relating to both young and old 'dependent' persons to the working age population is unsurprisingly highest in Albania (60.7%). The lowest TDR in the EU25 is the Czech Republic at 42.3% and in the EU15, Spain at 46.3%.

Collating the information from the demographic composition of Europe and the resultant average dependency ratios against the age-pyramid below should offer some insights into the distribution of age groups in the medium and long-term. The notion of dependency however must be seen as an independent variable as productivity levels and working ages are not absolute and could be altered, at both ends of the age spectrum, by innovative labour market policies.



Source: Council of Europe (2001) *Main demographic indicators for Europe*, Strasbourg

Figure 4 Age pyramid at 2002

The so-called ‘age bulge’ across Europe depicts the fact that the most common age is the cohort born in the late 1950s and early 1960s. This makes the average (mode) age 42 in 2002. Given continued trends as outlined above, in 15 years time (2017) the most common age will thus be 59, in 30 years (2032) it will be 74. It is in this long-term view of demographic trends that the implications of the increases in life expectancy and reductions in the birth rate will become apparent.

Fertility – a projected partial ‘recovery’?

The ‘World Population Prospects’ (2002 Revision) section of the UN’s Population Division recently predicted limited recovery in fertility rates between now and 2025, as below.

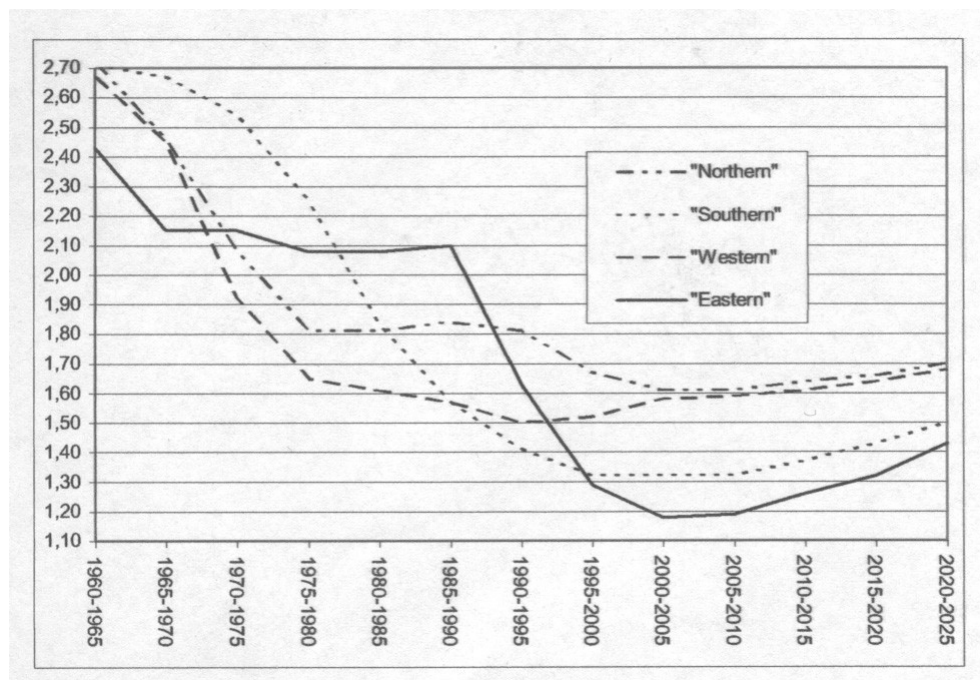
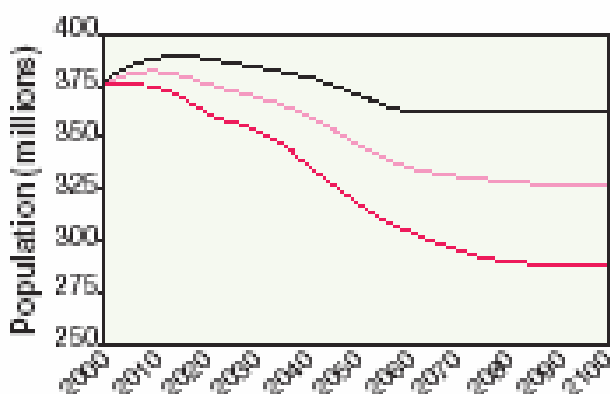


Figure 5 European Birth Rates 1960- 2025 (predicted) by Region

Alternative projections looking at the impact of fertility rate changes on the total population include varying scenarios, as below (Lutz, W. et al. (2003)



Negative momentum: effect of 20 more years of low fertility on population size in the EU. Population of the 15 member countries of the EU if one assumes that fertility immediately increases to replacement level and remains constant thereafter (black line) or that fertility remains at 1.5 (red line) or 1.8 (pink line) until 2020, when it rises to replacement level.

Figure 6

Social geography

- Household structures and composition – more single person units
- Divisions in geographical distribution by age, income and ethnicity and a rise in the proportion of the population of non-EU origin

Pensions and other budgetary changes

The Economic Policy Committee of the European Commission forecast that between 2005 and 2030 there would be an increase in public spending of between 3 and 7 percentage points of GDP in most Member States¹¹. Though this assumed no 'corrective action' would take place, some pension reform was taken into account. Most of the projected increase in public spending was forecast to be on pensions, health care and long-term care, whereas potential savings offsetting this increase were forecast in reductions of public spending on education and unemployment benefit (although this saving was considered to be modest). In most countries, it was forecast that the budgetary impact of ageing would start in 2010, with the largest increases taking place between 2010 and 2030. The EPC study concluded that there was a risk of unsustainable public finances emerging in this period in some half of EU Member States. The issue is especially relevant for the four countries which had the highest underlying deficits in 2002, that is Germany, France, Italy and Portugal.

A related, but less publicised, issue is the impact of an ageing population on international capital movements. In a paper for the IMF, Brooks (2003) has projected that beyond 2010, baby boomers in the European Union (and North America) will 'dis-save' in retirement, this being associated with large current account deficits causing both regions to become capital importers. This forecast indicates that demographic changes will have open economy effects, which have been largely ignored in the debate on pension reform. While pension costs can (conceivably) be altered by labour market interventions, health and long-term care costs of ageing are less subject to successful socio-political manipulation.

Health costs

In 1997 it was observed (Eberstadt, 1997) that an ageing population could result in Europe becoming a 'global nursing home'. However there are a number of reasons that suggest that health services and associated costs may not rise directly in line with the rise in the proportion of elderly people. Apart from the fall in the number of young and infants requiring medical treatment, the old have become healthier generation by generation, as a result of both medical advances and their early life experiences. At the other end of the life-cycle, improved ante natal screening has reduced the number of people entering old age with a disability, while better peri- and post-natal care and improved childhood nutrition has helped reduce the child death rate. In addition, there is mounting evidence that serious disease tends to be concentrated in a shorter time at the end of one's life. This is known as the *compression of morbidity*.

However, in spite of these issues, there is an association between greater longevity and increased health care need. The typical situation in 2000 was that the average elderly person remained free of prolonged morbidity or disability until their early seventies, after which they had an increasing and accelerating burden of disability until they died at about 75 years of age.

¹¹ This was based on a 'no policy change' scenario.

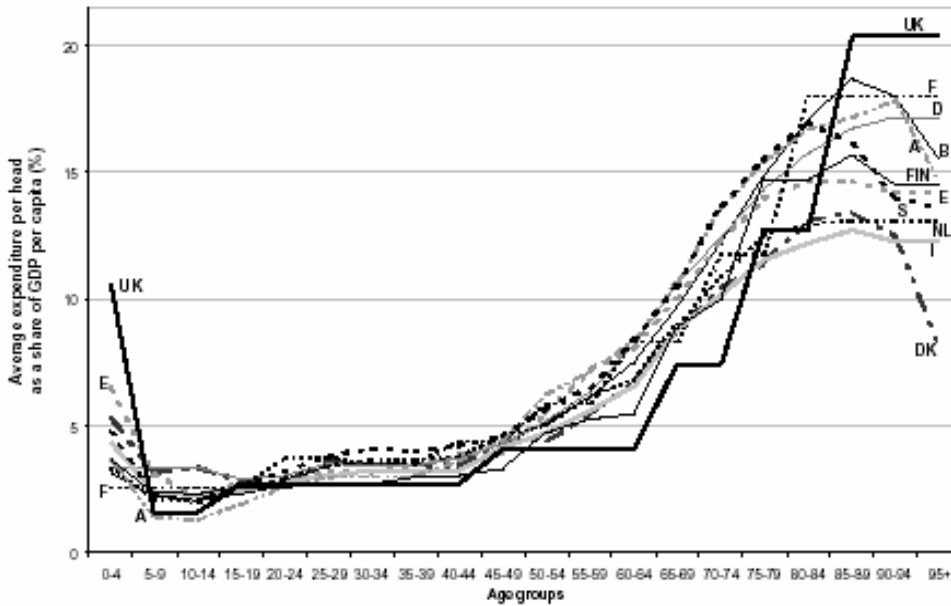


Figure 7 Age profiles for public expenditure per head on health care

It is possible to outline three ways in which these associations develop in people living beyond the age of 75 years:

- i. The **nightmare scenario** where the age at which disease and disability strikes remains as in 2005, but death is postponed. This is the basis for the claims of an 'exponential' growth of health care costs.
- ii. The **receding horizon scenario**, where the onset and progress of disease and disability is postponed to precisely the same extent as death itself, so that the number of years of diseased and disabled existence remains unchanged.
- iii. The **compressed morbidity scenario**, where both disability and death are postponed but the former more so than the latter, so that the interval between the onset of chronic disease or disability, and death is shortened.

If the second or third case prove dominant, the health care costs of the 'silver century' are unlikely to prove too onerous, however if the first case reflects the norm, the costs will be phenomenal. A constant 'high' in health care costs from age 80 onwards in many member states (based on data from the Economic Policy Committee of the European Commission) gives some credence to this more alarmist case, depending on the length of the 'plateau effect'.

2.1.1.5 Summary

2.1.1.5.1 Main trends

The main trend in fertility across Europe is convergence in decline, though in Southern Europe the decline is of more recent origin and in Eastern Europe the decline has been sharpest. The same can be said for mortality, with EU countries making the most marked

improvements responsible for most of the convergence. However in the case of mortality Eastern European countries, particularly those outside the EU have not experienced a reduction in death rates to the same degree and in some cases death rates have worsened since the early Nineties. Migration has, in contrast to fertility and mortality been rising across the EU, though its impact has been variable, population levels have increasingly depended on immigration.

Regional population trends have been characterised variously as centre/periphery, East/West and by 'region type'. The main developments in the former two models have been a move from the peripheral areas to central, economically strong zones which have left areas of de-population and movement generally from East to West, of younger workers. Six 'region types' were established by the research of ESPON 1.1.4 and they are presented, with the combination of factors making up their type being a mixture of migration and natural population change.

With respect to policy recommendations, ESPON 1.1.4 found a lack of clear policy direction at the EU level. Recent work from the Employment and Social Affairs Commission on the challenges of an ageing population indicates a possible move to a clearer position in the future. The issue of harmonising EU approaches to immigration, and its role in employment replacement, is also firmly on the agenda.

2.1.1.5.2 Main driving forces

Explanations for the decline in fertility and mortality, cluster predominantly around health and lifestyle factors. In the case of fertility economic and employment factors are also important, particularly for women. With regard to migration there are push factors explaining the desire to leave countries of origin and pull factors accounting for the varying attraction of different member states. These clearly are complex and studies demonstrate that there are a lot of country specific factors that explain migration trends.

2.1.1.5.3 The relevant indicators from the ESPON core indicator list to quantitatively measure some of the driving forces / impacts

| | |
|--------------------------|---|
| <i>Structure</i> | Total Population Male (percentage) Female (percentage) Median Age Total Population Development 'Natural' Population Development |
| <i>Distribution</i> | Urban Proportion Population Density (Persons per sq. km) Sex Ratio (Male per 100 Female) Sex ratio |
| <i>Growth indicators</i> | Average Annual Growth Rate Life Expectancy at Birth Total Fertility Rate Total Period Fertility Rate Infant Mortality Rate Child Mortality Rate (<5, <15) Mortality Rate (General and Age, Sex and Occupation Specific) |

| | |
|--------------------------------------|---|
| | Morbidity Rate (General and Age, Sex and Occupation Specific) De-population |
| <i>Composition change indicators</i> | Population under 15 (%) Population 15 - 64 Years (%) Population 65 & Above (%) Age Dependency ratio Sex Dependency ratio Potential Support Ratio Economically Active Population (%) |
| <i>Migration indicators</i> | Population density Net Migration (Immigration and Emigration/'gains and losses') Gross Migration (Immigration and Emigration) Migration by region and type of region (in-migration, out-migration), country, EU, pan-European, inter-continental Age specific migration rates (and net migration) Replacement migration (labour market measure) |

2.1.1.5.4 Relevant ESPON typologies for spatialising the scenario

- Immigration and net natural increase: tourist regions, suburban regions in large metropolitan areas
- Immigration, but net natural losses: towns and cities, especially in Western Europe, in some extend in lot of rural and industrial areas
- Emigration, but net natural increase: some peripheral areas, mainly in Turkey, but also in Northern Europe, rural France or Eire,

Emigration and net natural losses: industrial towns, rural areas, especially in eastern Europe

2.1.1.6 Questions to experts from the expert panel

- 1 What have been the main implications and impact of EU enlargement as a policy on the demographic situation in the EU?
- 2 Which other EU policies have had major demographic implications?
- 3 What level of immigration would be needed to keep age-group 16-65 from declining/general population from declining?

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2.1.2 Scenarios

Scenario sketch: The Silver Century

2.1.2.1 Scenario category

Type of scenario: Roll forward, Baseline

Strategic question: If current demographic, migration and labour market trends continue unchecked, how will Europe look in 2030?

2.1.2.2 Hypothesis underlying the scenario

This hypothesis is based on the continuation of current trends, both in terms of demographic evolutions and in terms of policy. The European population will continue to age and immigration will be very limited and controlled. The shrinking workforce will have to support the rising costs of health care and pensions for the growing number of older people. The fiscal demands of this 'ageing Europe' place tremendous stress on the 'European social model' of welfare provision which is based on a choice made to accept lower economic growth in return for more social protection and leisure time. Older people move to Southern 'retirement destinations' and to rural areas, where they use their 'grey' voting power to shift public spending away from nurseries, schools and playgrounds towards health care and retirement homes. Core-periphery and the east-west demographic polarisation further accentuates as a result of depopulation and loss of labour force.

2.1.2.3 The driving forces

The main driving force leading to an ageing population and a shrinking working age population is a continuation of the trend of falling total fertility rates. This trend is also continuous with a reduction in mortality rates. The outcome of this is increasing longevity and declining natural population growth.

Particular features of this driving force include the following:

- The most rapid growth of older cohorts is occurring in the oldest age groups – in particular those aged between 80-85 years, and centenarians (100+ years). In other words, population aging is becoming 'deeper' with an accumulation of very old, and potentially, very frail people.
- Population aging is particularly rapid among women, resulting in the 'feminization' of population aging (primarily a consequence of lower mortality rates among women). As the population ages, so the female to male ratio increases.
- Another consequence of lower female mortality is the fact that almost 45% of older women are widows, and so live without spousal support. This has added to the incidence of poverty among some older people. It has also contributed to a change in

living arrangements with an increasing number of older people living alone, or communally within an institutionalized residential setting.

2.1.2.4 The story line

Medium-term (to 2015)

Fertility rates have continued on a downward trajectory. The average fertility rate has dropped to 1.3 (0.2% less than the rate in 2004). Meanwhile, life expectancy has continued to rise. Indeed, at birth, life expectancy in 2015 stands at 82 years for men, 87 years for women. The proportion of European population above the age of 60 has also increased from 21 percent in 2000, to between 8 to 15 percentage points higher. In other word, the numbers of the population above 60 is approximately 1.5 times the level at the beginning of the century. Similarly, the proportion of the population below age 20 has declined up to 2015, but it is not directly a mirror image of the proportion of elderly. The proportion of children and teenagers in Europe has declined from its 2000 figure of 23 percent to 15 percent in 2015.

Demographic change has also begun to be reflected in economic change. The declining number of workers has slowed down economic growth, with the ageing of the population adversely affecting consumer demand, asset values, corporate profits, and balance sheets. This occurs more heavily in some markets than others - in mature markets such as autos and home appliances, sales have shrunk year after year. This is because, in its early stages, depopulation is characterized by the shrinking of the youngest age groups, and thus demand for products and services consumed by the young is the first to decline. In Germany, for instance, the cohort born between 1995-1999 is only 47 percent as large as the cohort born between 1970-1974.

As a proportion of the labour market, the service sector has continued to grow rapidly. The majority of the new 'working class' employment now involves servicing the private or domestic 'needs' of middle class older people. Also in evidence has been a growing inter-generational division in service sector delivery, with a steep increase in occupational demand focusing on providing for needs of a growing elderly population. This has been accompanied by a boom in professional 'caring' qualifications.

Despite a rise in home ownership among older people, there has been a steep contraction of housing demand. This has undermined property values creating both reverse wealth effects at the household level and balance sheet weakness among financial institutions that hold mortgage-backed assets. This is seen to be related to 20 percent decline in the 25-44 age group across Europe, with certain regions, such as Spain and Italy seeing more radical declines of 36 percent and 30 percent respectively.

Long-term (to 2030)

By 2030 the number of people in the over 60 age category is some 40% higher than at the turn of the century. In addition there has been a marked rise in the very old. In the UK for instance, compared with the 300 people aged 100+ in 1950, in 2030 there is a growing expectation that living for a century will be the norm for thousands of people. However, changes to the age structure are most marked in Germany. Here, by 2030, people over 65 accounted for almost half the adult population, compared with one-fifth at the beginning of the century. In other European countries the proportion of people over 65 is at least 30%. Furthermore, as the country's birth rate has failed to recover, the under 35 population has shrunk about twice as fast as the older population has grown. The net result is that the total

population, 82m at the start of the century, has declined to 71.5m by 2030. The number of people of working age has fallen by a full quarter, from 40m to 30m.

These trends have been replicated to varying degrees across the EU. The key factor continues to be a failure of population replacement, producing the fall in the total population and working age population. There may be some correlation in the rising longevity and falling fertility, so that at the same time as life spans continue to rise, so fertility continues to fall as women leave childbirth later and later. By 2030 the TFR is barely at 1 per woman. The combination of this decline in birth rates and the increase in the life expectancy of people has created the 'gerontological drift'¹².

At the beginning of the century it was estimated that by 2030 the age at which full retirement benefits start would have risen to the mid-70s in all developed countries, while benefits for healthy pensioners would be substantially lower than their 2005 levels. It was also argued that fixed retirement ages for people in reasonable physical and mental health would have been abolished to prevent the pensions burden on the working population from becoming unbearable. These predictions and concerns arose from a young and middle aged working population who suspected that there would not be enough pension provision when they reached traditional retirement age. But between 2005 and 2030, continued and growing electoral pressure from older voters, meant that pension reform was not politically feasible. Consequently, the estimates made by the World Bank in the 1990s, that spending on public pensions would increase from under 9% to over 16% of GDP between 1990 and 2040, have proved a fair evaluation¹³. By 2030 pension costs have almost reached 15% of GDP.

2.1.2.5 Impacts

Economic

The 'baby boomer' generation have been retiring in large numbers resulting in the 'emptying out' of workplaces. This has been particularly noticeable in the area of public sector service employment. Despite various policy measures to retain workers, old people have been drawing their pensions much earlier than the retirement age. This reflects the growing economic power of older persons, who not only continue to draw pensions based on transfers from a decreasing workforce, but have been able to negotiate and maintain subsidies on many aspects of life, such as transport, entry to cultural events etc. Some policy makers have argued that these need retaining given the propensity of older people to save rather than spend, all efforts need to be made to retain older people's stake in the functioning of the economy.

One outcome of this is that less than 4% of men remain in the workforce by the age of 65. The level of economic inactivity has also remained high, being slightly over the 2004 figure when 40% of Europeans of working age were economically inactive. Consequently the number of workers has fallen while the number of those dependent on them has risen. By 2015, the number of pensioners has grown relative to the number of workers, with 55 pensioners for every 100 workers (compared to 35 people of pensionable age for every 100 of working age in 2004). Thus the dependency rate stands at 2 people in work for every one in retirement. Inter-generational conflict resulting from this 'burden' has been the subject of much trade union debate, threatened and actual action.

Concerns about the declining competitiveness of the European economy relative to younger and growing economies continue. Developments in R&D and ICT remain the hope for its future global ranking, as well as reliance on technological advances to deal with persistent

¹² Characterised by an increase over time in the proportion of older people relative to younger people.

¹³ Higher than the forecasts of the Economic Policy Committee given below.

labour scarcity problems. In the field of long-term geriatric care, temporary work visas for migrant workers has become a typical way of ensuring adequate staff, this has led to allegations of the misuse of the guest worker syndrome, though there seems to be no shortage yet of migrants seeking these positions.

Socio-political

One of the consequences of the ageing of the population has been the increasing power of the 'grey vote'. As such, 'grey' voting power has blocked reforms to pension schemes and to proposals to increase the retirement age. Similarly, as the number of retired people has outnumbered young voters, older people have become a determining force in shifting public spending priorities away from provision of services commonly associated with the young, such as nurseries, schools and playgrounds, towards services for the elderly, such as retirement homes and health care. At the same time, spending on the latter years of life has risen as the proportion of users of these services has increased relative to younger people. These changes in spending begin to be reflected in cultural and media output, with a marked reduction in emphasis on youth evident in at the outset of the century.

Social differentiation has not been reduced during the ageing of Europe's population. Amongst higher income groups, live-in carers and domestic workers for older adults have become increasingly popular and large homes designed with, 'carers quarters' attached, have been developed throughout the EU. Conversely for lower income groups 'distance surveillance centres' have emerged. These sparsely staffed centres monitor the homes and movements of elderly people. Such 'distance care packages' have done little to confront the problem of isolation in old age. Indeed depression in the very elderly has increased as these forms of technology have not been used to maximise social or community contact. For all income groups the long-term consequences of a continued rise in marital and kinship insecurity has undermined family care of the elderly.

2.1.2.6 Territorialisation

The economic impact of the ageing population has varied according to country within the EU, as some countries have been much more vulnerable to ageing than others. In countries with more serious pension problems (such as France and Germany) public debt has grown to 100% of GDP (well above the 60% threshold required from the new member states). Within the EU, Italy and Germany have seen their working age population plunge by 47 percent and 43 percent respectively. In contrast, France and the United Kingdom have experienced less drastic declines of 26 percent and 15 percent. In countries where the rising costs of old age has been more severe (such as France, Italy and Spain), intergenerational conflict has been taking the form of so-called 'age riots' which have taken place intermittently in certain metropolitan areas.

At a macro level, the East/West, South/North, centre/periphery and urban/rural divisions within the EU have started to take on a significant age element. The East, South, rural areas and periphery have become either magnets for older people (in the case of the South) or areas where older people have been increasingly left behind, as younger cohorts move to economically more dynamic areas.

Many affluent older people are more mobile and have more diverse lifestyles. As such, they have begun to choose 'where to retire' and, increasingly, they have chosen to retire in areas with lower crime rates and good access to services, (particularly health care and hospitals), and with a pleasant climate. Indeed, residential segregation by age is apparent at the

macro and micro level. Regarding the former, across Europe, older people are moving to Southern European 'retirement destinations'.

At the micro level, within member states, there are signs of 'age' segregation with retired people concentrating in rural areas, although there is a residual (mainly low income) older population remaining in urban areas. There are also an increasing number of gated type communities, which designate age or 'no children' conditions on residents. These trends are producing a growing spatial differentiation by generation.

2.1.2.7 Final image of the ESPON space in 2030

In 2030 the balance of power politically, economically and spatially will be increasingly dominated by older people. In territorial terms this will be apparent in a division of space with younger people being concentrated around urban working areas and retirees distributed across suburban and rural spaces. At a macro level there will also be differences in the age distribution of the population, with Southern areas of the EU becoming retirement destinations on a much larger scale than was apparent at the turn of the century. It has become the norm to work in the MEGA areas of the Core during working years, and retire away from these areas at an age that has become contested, but remains at an average of 65, in spite of continuing longevity.

2.1.2.8 EU policies concerned

When excluding migration as an instrument to compensate emerging deficiencies in the age structure, changes in the demographic structure of Europe by 2030 can only be enacted by policies designed to influence other non-demographic processes. These could target incentives to increase fertility, increase the work force participation of women [footnote: It is arguable however that rising female labour market participation is one of the reasons for falling fertility.] and older adults, or promote technical improvements which would lead to a rise in productivity irrespective of the demographic decline. The latter involves a focus on the non-demographic factors affecting the countries' economic performance which could be used to offset demographic trends which may be more difficult to affect, especially since it is the declining proportion of labour incomes and the growing concentration of wealth as well as the shortening of the period of working life that are likely to contribute to a fiscal crisis in welfare provision rather than the ageing of the population per se.

2.1.2.8.1 Questions for experts

- 1 What kind of economic demands and requirements can be placed on a smaller working population by a larger ageing population?
- 2 How is population ageing going to affect the current territorial imbalances in Europe – in what ways and for better or worse?
- 3 How might ageing effect territorial differentiation in terms of cohesion and competitiveness?

2.1.2.9 Summary

Summary Table of the *Silver Century*

Hypotheses

- An ageing population
- Shrinking working age population
- Shifts in public expenditure
- Population movement from north to south

Changes

Economic

- Falling workforce
- High level of economic inactivity
- High dependency rate

Social

- Grey voting power
- Shifts in service provision

Spatial

- Greater mobility for the elderly
- Residential segregation in the older population
- Migration of wealthier elderly to rural and Southern locations
- Residual low income older urban population

Dynamics

Medium term

- Falling fertility rates
- High life expectancy
- Slow down of economic growth
- Growth of service sector
- Boom of caring professions
- Concentration of housing demand

Long term

- High percentage of those 60+
- Growing percentage of those 100+
- Low population replacement
- GDP on public pensions increases to 15%

Resulting issues

- Pension and budgetary change
- Rising health care costs
- Increased health care need

2.1.2.10 References

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Scenario sketch: *Open border*

2.1.2.11 Scenario category

Type of scenario: Roll forward, Prospective Policy

Strategic question: If current demographic, migration and labour market trends are changed by a open and actively promoted immigration policy, how will Europe look in 2030?

2.1.2.12 Hypothesis underlying the scenario

European societies become aware of the strong implications of their strongly ageing populations on the demographic, social and economic future. Political discussion mainly focus on the implications on shrinking labor markets, on financing of pensions of the strongly increasing number of elderly people, but also on the capacity of European societies for economic and cultural innovation.

The European Union and quite a lot of its member countries actively change their immigration policy around the year 2010. Since that time, immigration from other continents, especially from Asia, Africa and South America is no longer strongly restricted, but regulated in more or less coherent immigration policies.

2.1.2.13 The driving forces

The main driving force leading to a change in migration policy has been the awareness of the demographic reduction. In fact, the problem of the ageing population and a shrinking working age population had become a real political shock after 2005 when politicians and the public of different countries in Europe became aware of the social, demographic and financial impacts which could occur in case of a continuation of the trend of falling total fertility rates and the reduction in mortality rates without the compensation through immigration.

2.1.2.14 The story line

The awareness of the demographic impact grew first in Spain, in which a great number of unregistered workers from Northern Africa lived. Some time later Germany, where the immigration from the Republics of former Soviet Union diminished after 2000, decided to open the borders to immigrants from other regions. Hungary, where population had diminished since several years, followed. Finally, the EU Commission decided to strengthen a new policy opening the border for the whole territory – even if a great number of amendments, in time, in geographical coverage and especially in skills demanded limited the extent of the decision.

This decision, even if it had been taken first under some contextual pressure such as the situation of boat immigrant in the Mediterranean, migration on the Russian border and legalization in Great-Britain, has also it has been a consequence of the discussion about adhesion of Turkey. The process has to been seen as the result of a collective awareness of

the impossibility to maintain the 'Fortress Europe' in face of a demographic and economic situation in which population decrease, strong ageing process and loss of competitiveness would have altered the future of the continent. The intensity of the policy process was high, so that in a few years a majority of the population of most of the member states accepted the opening of the borders.

After 2010 and especially since 2015, net immigration rates increased in almost all European countries. Only after 2020, some restrictions started to limit somewhat the liberal immigration policy. During the whole period since 2010, we can observe the following effects of the migrations on the total of population increase:

- For Europe as a whole, the process of aging population continued and accelerated during the 2020s. The most rapid growth of older cohorts is occurring in the oldest age groups – in particular those aged over 80 years. In other words, population aging is becoming 'deeper' with an accumulation of very old, and potentially, very frail people.
- The aging process has somewhat been reduced by immigration, strong effects on population growth, on the age structure of the population and also on the tendency of feminization.

The increasing immigration processes not only contributed to an influx of younger population during their active period, but also to an upturn in fertility, of the immigrants as well as that of the indigenous population. Thus, the dramatic demographic change projected around the year 2000 did not occur. On the other hand, the effects of aging population, of immigration and also of the migration patterns within Europe brought deepening social and spatial inequalities. In addition, immigration did not touch all the countries in the same way, and since regions of recruitment have been quite different, processes of integration, return to their country and exchange between the different contexts have been different. The disparities between the countries as well as between urban and rural regions accelerate for several decades, before new concepts of territorial development have been elaborated at the end of the 2020s.

2.1.2.15 Impacts

Demography

As mentioned, the demographic outlook for Europe for the 21st century has been the decisive factor of the change of the immigration policy. Under these aspects, the 'open border' policy has been successful, since the age pyramid has been enlarged in the age groups of young adults and children. Of course, the number of elderly people has continued to increase and their number reached new record in absolute and relative figures. But the index of dependency did not grow any longer after 2020.

In a direct or indirect effect of the policy, the number of birth and even the fertility rate re-increased after 2015, bringing a second effect of counterbalancing the ageing process of the European population.

The large acceptance of immigration brought an increasing number of young mixed marriages – despite some reluctance of the endogenous population - and the maintenance of endogamy in some groups of immigrants.

Economy

Overall, the 2010s and 2020s have been a period of economic growth, which allowed the integration of a great number of new immigrants as well as the national population in the labour markets. Nevertheless, the strong increase of elderly people – the baby-boom generations born between 1945 and 1965 – put pressure on social welfare system, on the health sector and on changing demand for the housing sector, for tourism and leisure and in consumption. Immigrants concentrated – at least in relative terms – in the health sector, in tourism, in construction, but also in industry and production, which did not undergo the process of delocalization as it was around the year 2000. In addition, the new immigrants created types of jobs linked to demand of their own population, especially in commerce, education and transports.

As well as immigration, higher fertility had an effect of reducing the work force participation of younger women. On the other hand, older adults, both men and women became more strongly integrated into the labour market, since the legal age of retirement has been risen in most countries, and since the economic demand has been positive. This tendency has been underlined by the effect of a high qualified generation of older persons in working age born between 1960 and 1980. This generation has been highly motivated since they have lived in an experience of a difficult period of entrance to active life.

Increasing active population, higher activity rate also from elderly people and a growing percentage of immigrated work forces conducted to stagnation in productivity. On the other hand lower productivity per working hour could be compensated by a stabilisation of social transfers (i.e. on unemployment, retirement).

Socio-cultural

Periods of high immigration are often characterised by increasing tensions between generations, between less qualified endogenous workers and new arrivals, especially skilled main force, between richer and poorer regions, but especially between immigrants and inhabitants in rapidly changing town-quarters. During the first decades of the 21st century, some of these cleavages have been clearly active, especially the spatial ones.

In general, despite the high number of new arrivals, ethnic conflicts have been quite rare, though some violent roots had to be claimed in the 2010th, especially in some Eastern metropolis, in some old-industrial towns in Western Europe.

In general, the quality of security did not worsen during the last 30 years, even if problems of integration touched many urban regions. The liberal immigration policy and the high financial efforts in integration in the national context allowed maintaining security at a level, which has been considered by the populations as satisfying.

On the other hand, integration in a local or national context did not touch the whole immigrated population, or the very qualified, or the mainly unqualified groups. English became the standard language in many social contexts, not only in tourism, multinational enterprises and research, but also in culture, commerce, transports and health sector.

The tensions between generations went often along the generation shift, since the older generation has been composed by 80 to 90% by nationals, while the young generation is of foreign origin by more than 50%, such as in classical immigration countries (Luxemburg, Switzerland), but also Germany, Sweden or Southern Spain.

The political acceptance of the world-wide increase of migration and the opening of the borders of Europe have started to be seen as an evidence, since fertility rates differed strongly between the Continents. But the increasing immigration had conducted to social tensions. High investments in the education system had to be foreseen, especially for basic school level, since immigrants started to be dominant in several metropolises and within them in a lot of quarters. Investments in public housing policy had to be reintroduced, since the demand on inexpensive apartments became chronically high.

Strong immigration and internal migration within Europe strengthened the position of the English language, which not only increased its role as the dominant language for Europeans, but also for immigrants, especially for skilled persons, coming from China, Russia and the Arab countries.

Foreign policy

Introducing migration as an instrument to compensate emerging deficiencies in the age structure, the EU policy had chosen to follow an active and proactive policy in order to intervene on the demographical structure. By choosing this way, the EU has also had to intervene in a series of accords with the Non-European countries which have been the origin of immigration, such as Central Asia, India, Pakistan, Indonesia, China, the Arab countries, Africa, Brazil and Spanish Latin America. These accords have been made both bilaterally as well as in a general facilitation of migration.

Positive net migration is composed of strong immigration, but also quite important flows of emigration and returns to the countries of origin. Accords on education bonuses have been given to countries attracting young immigrants as well and concordats for innovation transfers have underlined still the growing interdependency on a world-wide scale.

Europe went through a series of political crises due to international tensions between Outer-European countries, especially in the Arab world, in which the political interests diverged between some member countries. This has been especially the case after adhesion of Turkey.

2.1.2.16 Territorialisation

Territorial inequalities grew. The immigration from abroad but also within the Union tended to concentrate on the Northern, Western and Southern countries of Europe, but neglected somewhat the central and Eastern countries. The demographic evolution had been clearly in favour of urban and suburban regions, but in despite of rural parts, especially of rural parts with low accessibility. In this behalf, the 1980th and 1990th had been the last decades for a long time to show positive demographic evolution in rural parts. Thus, the demand for a continuation of the policy of structural funds has been expressed increasingly after 2015 – and it has been followed by measures in order to strengthen rural and peripheral Europe, especially in the South-East and Est.

Immigration from outside the Union shows some differences by country of origin, by level of education, by activity fields, by groups of recruited immigrants, by cultural activities and in housing demand. Differences are also given by main origin and destination patterns; Spain, France and Great-Britain have continued to have privileged contacts to the former colonies of the 19th century and thus proposed integration in a known linguistic context.

Differences between the European countries have been underlined by the variability of the immigrants: Spain and Portugal as destinations for South Americans (as well Moroccans), France for North and West-Africans, Italy and Greece for Eastern Mediterranean's, Northern and Eastern Europe from Russia, Iran and Turkey.

Quite strong population growth in Western Europe, especially in France, as well as in Scandinavia, due to strong immigration and natural increase; slight population growth in Southern Europe, in Great-Britain, Germany, Poland and the Czech Republic due to immigration counter-balancing natural population losses; demographic stagnation in other Central European countries, such as Hungary and the Baltic countries, but also in Spain, where low natural increase has not been compensated for by net migration growth.

Aging processes concerned quite heavily some countries with serious pension problems (such as France and Germany). Within the EU, some countries have been much more vulnerable to ageing than others. Immigration did not touch all European countries in the same way and it did not contribute in all regions to counterbalance natural losses. We can distinguish the following pattern, which have been dominant during the 2010th and 2020th:

- Quite a strong population growth in France, the Netherlands, in Scandinavia, as well as on the Mediterranean Islands (Cyprus, Malta) due to high immigration rates and positive natural increase;
- Population increase essentially due to a positive balance between births and deaths, but relatively low gains by migration: Ireland, Finland and in some extent Poland and Lithuania.
- High net immigration, but negative natural increase: Germany, Belgium, Czech Republic, Switzerland, Italy, Spain, Greece;
- Low net immigration and natural decrease: Baltic states, Hungary, Bulgaria,
- High natural increase and net migration losses: Turkey

2.1.2.17 Summary

In 2030, more older people than ever before are being supported for longer than ever before from a population of working age that are shrinking continuously in absolute size. In order to counterbalance this tendency, immigration from outside Europe has been encouraged by developing a new demographic policy of the European Union. This policy actively supported the arrival of immigrants, legalized illegal presence and tried to encourage integration models. This policy had a positive effect on the age structure of most of European countries, which otherwise would have turned in a decreasing and strongly ageing spiral.

The implication of the policy touched profoundly the demographic structure of most of the member countries, the labour market and the social insurance systems. But immigration touched also the social, cultural and political life of Europe as well as the interrelations of Europe and the main regions of immigration. In addition, migration had very strong impacts on the countries of origin as well. During the twenty years this policy has been applied, the character of immigration has changed, since the intensity of immigration diminished and the international migration flows have become less unequal. Not only re-emigration increased, but also more Europeans than before choose to spend part of their life elsewhere or to emigrate definitively.

The integration of some 150 millions of new immigrants caused quite severe problems, especially in metropolitan areas, where social segregation and differentiation by origin got quite important. Nevertheless, the fact that new immigrants from different origins did not concentrate in distinct quarters and that both integration in national context as

well as in English permitted to avoid too strong conflicts. We have to distinguish the impacts of the first years of the changing policy from that of the later adaptations, in which some violent reactions took place, parallel to a widespread social acceptance of a new European society. Currently, in 2030, back-lashes with some legal and social restrictions of immigration can be observed, but the experience of the last decades shows that this will probably be a transitory phase. Open border policy has also been accompanied by a re-increasing role of social welfare state in the domains of housing, social integration and health sector.

The strongest preoccupation of the migration process has been the strong spatial effects of these important population movements. On the larger scale, we observe some countries and regions with very limited immigration from abroad and some strong concentration on big metropolis. On the local scale, migration conducted to social and spatial segregation, even if this processes did not have been as important as they have been in North American metropolises around the turn of the century.

| Summary Table of the Open borders | |
|--|--|
| Hypotheses | <ul style="list-style-type: none"> • An ageing population and shrinking working age population of the indigenous population • Immigration from outside Europe accepted and regulated by a Union-wide and national immigration policies • Population flows to Western and Southern Europe, stagnation in the East |
| Changes | <p><u>Economic</u></p> <ul style="list-style-type: none"> • Maintain and gains in workplaces • Medium level of economic inactivity • Quite high dependency rate <p><u>Social</u></p> <ul style="list-style-type: none"> • Problems of integration • Social differentiation <p><u>Spatial</u></p> <ul style="list-style-type: none"> • Immigration to metropolis • Residential segregation and inter-community tensions • East to West migrations • Residual low income older urban population |
| Dynamics | <p><u>Medium term</u></p> <ul style="list-style-type: none"> • Re-increase of fertility rates • High life expectancy • Maintenance of economic growth • Growth of service sector and boom of caring professions • Increased housing demand • Short-term changing policies • Tensions between member states <p><u>Long term</u></p> <ul style="list-style-type: none"> • Economic dynamic evolution • Innovating society • Ageing of population • Strong positive net migration |
| Resulting issues | <ul style="list-style-type: none"> • High costs of integration • Problems of segregated regions and quarters • Increased health care need |

2.2 Transport

2.2.1 Scenario base

2.2.1.1 Sources of information:

The transport scenario base is a compilation of information originating mainly from following documents and reports:

- White Paper. European transport policy for 2010: time to decide. European Commission. 2001.
- Energy and transport. Report 2000-2004. European Commission. 2004
- Intelligent transport systems. Intelligence at the service of transport networks. European Commission. 2003.
- Intelligent transport systems. Results from the transport research programme. European Commission. 2001./
- Freight intermodality. Results from the transport research programme. European Commission. 2001.
- European transport networks. Results from the transport research programme. European Commission. 2001.
- Sustainable mobility. Results from the transport research programme. European Commission. 2001.
- Communication from the Commission 'Cohesion and transport'. 1998.
- Report of the high-level group on the Transeuropean Transport Network (Van Miert Report). 2003.
- European energy and transport. Trends to 2030. European Commission. 2003.
- ESPON Study 2.1.1. 'Transport services and networks: territorial trends and basic supply of infrastructure for territorial cohesion'. Coordination: CESA Tours. 2004.
- ESPON Study 2.1.1. 'Territorial impacts of EU Transport and TEN policies'. coordination: Institut für Regionalforschung. University of Kiel. 2004.
- TEN-STAC. Scenarios, Traffic forecasts and analysis of corridors on the Transeuropean Network. Coordination: NEA Rijswijk. 2004.

2.2.1.2 Present situation and trends

2.2.1.2.1 *Increasing traffic congestion in central regions vs. isolation of more peripheral regions*

During the 1990s, Europe began to suffer from congestion in certain areas and on certain routes. The problem is now beginning to threaten economic competitiveness. Paradoxically, congestion in the centre goes hand in hand with excessive isolation of the outlying regions, where there is a real need to improve links with central markets so as to ensure regional

cohesion within the EU. To paraphrase a famous saying on centralisation, it could be said that the European Union is threatened with apoplexy at the centre and paralysis at the extremities.

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

The phenomenon of congestion or lack of connections for the peripheral regions affects the competitiveness of companies by increasing their costs. It also has a negative impact on the environment through extra fuel consumption, as well as on the citizens' well-being due to the many side effects of transport. According to the Commission, the external costs of congestion due to road traffic alone represent approximately 0.5% of the Gross Domestic Product (GDP) in the European Union.

Experience shows that the volume of overall traffic always, or almost always, increases more quickly than GDP and that inter-urban flows and, in particular, long distance flows, grow even faster. In addition, enlargement will accelerate this traffic growth, in particular for freight. At the same time, the provision of infrastructure does not keep pace because of, amongst other things, a lack of public financing and the current difficulty of mobilising private funds. This gap between transport needs and the supply of new infrastructure will lead to an impasse which will not be without negative consequences for the competitiveness of the economy of the Union.

Very rapid growth in traffic takes place across the Pyrenees and the development of new rail freight capacities is crucial given that land transport traffic amounts at 70 million tonnes in 1999 and will more than double by 2020. The current roads cannot absorb such an increase in traffic (+10% of yearly increase of road traffic). Personal mobility, which increased from 17 km a day in 1970 to 35 km in 1998, is now more or less seen as an acquired right.

If most of the congestion affects urban areas, the trans-European transport network itself suffers increasingly from chronic congestion: some 7 500 km, i.e. 10 % of the road network, is affected daily by traffic jams. And 16 000 km of railways, 20 % of the network, are classed as bottlenecks. A total of 16 of the Union's main airports recorded delays of more than a quarter of an hour on more than 30 % of their flights. Altogether, these delays result in consumption of an extra 1.9 billion litres of fuel, which is some 6 % of annual consumption.

2.2.1.2.2 *Imbalance of transport modes*

European transport suffers from an imbalance between transport modes, to the detriment of railways, more particularly in the rail freight transport, of maritime shipping and of inland waterways. While this reflects the fact that some modes have adapted better to the needs of a modern economy, it is also a sign that not all external costs have been included in the price of transport and certain social and safety regulations have not been respected, notably

in road transport. Consequently, road now makes up 44 % of the goods transport market compared with 41 % for short sea shipping, 8 % for rail and 4 % for inland waterways. The predominance of road is even more marked in passenger transport, road accounting for 79 % of the market, while air with 5 % is about to overtake railways, which have reached a ceiling of 6 %.

In the railway sector, for example, between 1970 and 1998, the share of goods market carried by rail in Europe fell from 21% to 8.4%, even though the overall volume of goods transported rose spectacularly. International rail haulage enjoys an average speed of only 18 km/h, due in particular to the priority given to passenger trains, deterring shippers from using rail freight. The growing imbalance between transport modes, to the detriment of railways (in particular for freight transport), maritime and inland waterways, needs to be addressed, including through better transport management. It is a matter for regret that modern techniques and infrastructure have not always been matched by modernisation of company management, particularly rail companies. Major stumbling blocks to the development of European rail freight are inefficient use and technical and physical insufficiencies of the rail infrastructure. Incompatibility of slow and fast trains as well as technical and operational differences between national networks in combination with a low priority for freight trains in train path allocation and daily train path management limit the growth potential of rail freight services.

Maritime transport represents more than 40% of the volume of intra-Community freight flows, i.e. almost on a par with road transport. But maritime transport could do more to remove lorries from the roads in congested areas. Maritime routes which better link countries isolated by natural barriers such as the Alps, the Pyrenees and the Baltic Sea, as well as island countries, could be as important as motorways or railways in the trans-European network.

Aviation is hampered by regular delays as a consequence of the limits of current air traffic management systems. Air transport suffers on the one hand from the fragmentation of the air traffic management services in Europe, with 29 national systems and 58 Air Traffic Control Centres developed to different standards with different systems and capabilities, and on the other hand, from the too slow implementation of new technologies.

A particularly important factor in the development of air transport is the emergence of low cost companies. This does not only increase general air traffic which becomes competitive even against railway transport on relatively short distances, but it boosts also the development of regional airports. The map of air traffic flows in Europe has considerably changed in a few years due to low cost companies. Further changes may however happen, since the large number of low cost companies created is progressively being reduced for reasons of insufficient competitiveness. This may have impacts non only on fares, but also on the number and location of airports serviced.

2.2.1.2.3 Delays in infrastructure realisation and low levels of investments

The coherence of the trans-European network suffers from the actions of the past. The transport infrastructure networks in the various Member States were developed above all according to a national logic, giving priority to the development of radial routes serving major cities, thus affecting overall balance. Experience shows that it is the cross-border sections which are generally the last to be carried out on a given transport route. Furthermore, the Member States do not all show the same interest in the transport modes - alternatives to road - which sometimes leads to situations where canals or railway tunnel projects for freight are only built up to one side of the border.

As the White Paper on the European transport policy noted, six years after the adoption of Decision 1692/96/EC on the Community guidelines for development of the trans-European transport network, barely 20% of the projects planned for the year 2010 have been completed. The longest delays affect the cross-border and railway projects. Of the fourteen projects adopted by the Essen European Council in 1994, only three have been completed and two had even not been started in 2000.

The Member States, which invested on average 1.5% of the GDP in transport infrastructure during the 1980s, now invest less than 1%. New member/accession countries currently invest roughly 1.5% of their GDP and it seems to be quite unlikely that they could significantly increase this level without external support. Only a small part of these investments is actually devoted to infrastructure of the trans-European transport network, the lion's share being allocated by Member States to other national, regional or urban transport projects. Recent estimates point out that overall investments in the trans-European transport network in the EU27 amount to less than €30 billion a year since 1996. With such a pace of investments, more than 20 years will be needed to complete the network.

In relation to networks, delays have accumulated for large-scale cross-border transport projects as a result of complex administrative procedures, low priority by Member States, uncertainties associated with the choice of routes and the planning process and the complexity of co-ordinating projects with a cross border dimension. This has been compounded by the difficulty of structuring supranational businesses to run such operations. The absorption capacity of the administration in the new member/accession Countries was also an important factor in the speed with which projects moved forward. Finally, even where Community funding has been available, the level of support and political commitment has not always been sufficient to encourage public or private actors to move ahead with investment. Experience from the Essen infrastructure projects selected back in 1994 and from the on-going projects funded by the EIB and through the Structural Funds show that non-financial factors can often be more powerful barriers to the viability and attractiveness of particular projects than the actual lack of funding.

2.2.1.2.4 Specific trends in new member countries

As a result of the reforms in CEEC, the growth of passenger transport activity per capita in new member/accession countries was limited to just 2.4% in 1990-2000 compared to 15.7% in the EU-15. In new member/accession countries, the distance travelled per person reached 6665 km in 2000, considerably lower than the level in EU-15 (13260 km per capita in 2000). Overall passenger transport activity increased in the last decade by 1.9% in new member/accession countries and 19.7% in the EU-15. In freight transport, there was a strong decoupling of activity from GDP due to the restructuring of CEEC economies, which involved structural shifts towards less energy intensive manufacturing processes and services. This resulted in a decline of freight transport activity by -16% in the nineties in new members/accession countries, whereas freight transport activity in the EU-15 increased by 30% in the same period. Although, from their planned economy days, the candidate countries have inherited a transport system which encourages rail, the distribution between modes has tipped sharply in favour of road transport since the 1990s. Between 1990 and 1998, road haulage increased by 19.4 % while during the same period, rail haulage decreased by 43.5 %, although — and this could benefit the enlarged European Union — it is still on average at a much higher level than in the present Community.

2.2.1.2.5 Accessibility

Potential accessibility is based on the assumption that the attraction of a destination increases with size, and declines with distance, travel time or cost. Destination size is usually represented by population or economic indicators such as GDP or income. Accessibility to population is seen as an indicator for the size of market areas for suppliers of goods and services; accessibility to GDP an indicator of the size of market areas for suppliers of high level business services. Potential accessibility is founded on sound behavioural principles but contains parameters that need to be calibrated and their values cannot be expressed in familiar units. Potential accessibility is therefore expressed in percentage of the ESPON space average.

Potential accessibility by road

The most accessible regions by road to the population (accessibility index higher than 120% of ESPON space average) are quite identical with the Pentagon, with an extension eastwards to include East-Germany. The regions with highest accessibility (accessibility index above 180% of the ESPON space average) are located in the Benelux countries and in the German Länder of Rheinland-Pfalz and Nordrhein-Westfalen. The least accessible regions (accessibility index below 40% of the ESPON space average) are all located in the European periphery (Nordic countries, north of Scotland, Ireland, Portugal, western and southern parts of Spain, Corsica, Sardinia, Greece, Cyprus, Malta, eastern parts of Romania, Baltic states). It is remarkable that the largest part of the new member countries of central and eastern Europe have an accessibility index similar to that of south-west France, northern Spain and Denmark, which is in all cases better than that of Portugal, Ireland, western and southern Spain.

Potential accessibility by rail

Here again, the most accessible regions (accessibility index above 120% of the ESPON space average) are largely contained in the Pentagon, with some extensions towards East-Germany as well as towards the Rhone valley and the Loire valley in France. Areas with low accessibility by rail in the European periphery (accessibility index below 40% of ESPON space average) are more extended in the case of Spain, Bulgaria and Romania.

Potential accessibility by air

Potential accessibility by air provides a completely different picture, compared with those on land transport accessibility. The map of Europe is converted into a patchwork of regions with high accessibility surrounded by regions with low accessibility. Low accessibility is however not a concern only for those regions of the 'traditional' European periphery, but is also an issue for some regions located in the European core. Some regions of central France, south-west of Paris, are classified in the accessibility category below 40% of the ESPON space average. Other regions with low accessibility are mainly in the European periphery: Nordic countries, Baltic States, peripheral regions of Romania, border regions between Spain and Portugal, central Greece, northern Scotland.

2.2.1.2.6 North-south and east-west patterns in the organisation of major flows and corridors

Maps of major flows of road and rail traffic show various corridors broadly orientated in the north-south direction, some running from north-west to south-east along the axis of the 'Blue banana' and others running from north-east to south-west. The morphology of flows

varies however from country to country, following that of networks. It is possible to identify three main types of network corridors:

- centralized networks with a peripheral way for instance the Iberian Peninsula
- parallel networks like in France, Italy, United Kingdom, Sweden, Finland...
- networks with a square pattern as for example the German network.

The others are mixed networks from the three main types. The third type is the most connected network, the least vulnerable because it has many possible paths. The vulnerability of the others is greater.

A general reorientation of economic flows in the East-West direction has already begun during the 90s. What is now expected is growing intensity and in some cases changing composition of flows. Trade between the Western and Eastern parts of Europe will increasingly show the pattern of the theory of comparative advantages and will therefore increase. Some transport flows will also become modified due to elimination of barriers between the present candidate countries. Barriers have several dimensions, from physical to cultural, but are generally lower along established trade and transport corridors. This leads to the assumption that development of the cities, city clusters and city networks located in corridors that mainly constitute axial extensions of the single Global Integration Zone of EU-15 will be reinforced.

The evolution of flows has to be considered in relation with the capacity of networks and with the resulting conditions of accessibility. While a concentration of high-accessibility regions is to be found in north-west Europe reaching from the South of England over the Benelux countries and the Rhein-Ruhr metropolis along the Rhine valley to Switzerland and northern Italy (the 'Blue Banana'), with another peak in the Paris region, one of the main obstacles for the integration of the candidate countries in eastern Europe is the poor quality of transport infrastructure in these countries and between these countries and western Europe. This problem has already been addressed by the Transport Infrastructure Needs Assessment (TINA) programme of transport infrastructure corridors for the new member countries. From an economic point of view, TEN-T and TINA projects seem to support the spatial integration of the new member and accession countries into the European Union.

2.2.1.2.7 *Restricted permeability on east-west cross-border and transnational corridors*

Borders can be classified according to their permeability, according to the frequency of border crossings and of the administrative arrangements which facilitate the crossing of these borders. As an average, there is an international road border crossing on each 60 km of borders in the Enlargement Area. But this density is largely differentiated: there are 3 crossing points per 100 km border between EU-15 member states and new member states, 1.5 crossing points per 100 km border among new member and accession countries, 0.75 crossing points per 100 km border on borders to and between third countries. But there are extreme cases. On the borders between Greece and Bulgaria, between Romania and Ukraine, the density is only 0.4 crossing point per 100 km. While in the past, a relatively dense network of roads and railways connected the areas of the new member/accession and neighbouring third countries, which are now on the two sides of the borders, according to estimations, only 40 percent of built roads, and 50 percent of built railway lines crossing the borders are used presently as international border crossings. Some other roads can be used only by citizens of the two neighbouring countries or regions, some are open only for a

couple of hours daily, some are open only on holidays or during some extraordinary events, others are never crossbar, even the rails have been removed.

2.2.1.3 Horizontal issues

2.2.1.3.1 *Transport and energy*

In the last decade the transport sector was by far the fastest growing energy consuming sector in EU-25, with energy demand for transportation increasing at a rate more than 3 times higher than overall final energy demand (+2.0% p.a. in 1990-2000 compared to +0.6% p.a.). Both EU-15 and new members/accession countries exhibited identical growth rates (i.e. +2.0% p.a.) as regards transport demand. In the new members/accession countries, energy demand increased in the 1990s only for transport purposes while energy demand decreased in all other final demand sectors.

Transportation accounted for 31 % of EU-25 total final energy demand in 2000 up from 27% in 1990. The corresponding share in EU-15 was somewhat higher and also increasing (32.4% in 2000, up from 29.5% in 1990). In new member/accession countries transport accounted for only 19.7% of final energy demand in 2000 (compared however to just 12.8% in 1990). In the past the transport sector of new member/accession countries, and especially CEEC, had been characterised by limited private mobility, extensive use of subsidised public transportation, obsolete infrastructure and inefficient use of freight capacity. The economic reforms of the 1990s led to a big increase in private car ownership (although the use of cars has not followed the same trend) accompanied by a decline in public transport. At the same time freight transport experienced a significant restructuring process, with trucks overtaking rail in importance.

2.2.1.3.2 *Transport and economy*

Transport is an important function of the economy. It conditions the mobility of goods and people and largely contributes to economic growth. Total expenditure in the transport sector (EU-15) runs to some EUR 1 000 billion, which is more than 10 % of gross domestic product. The sector employs more than 10 million people. It involves infrastructure and technologies whose cost to society is such that there must be no errors of judgment. Indeed, it is because of the scale of investment in transport and its determining role in economic growth that the authors of the Treaty of Rome made provision for a common transport policy with its own specific rules.

The long-term link between levels of economic development and transport is generally uncontested. An efficient European transport system is essential for economic development and to enable citizens of the Union, economic operators and regional and local communities to derive full benefit from an area without internal frontiers. However, certain other factors imply that the link requires close examination. First, for certain kinds of economic activity, the transport of freight accounts for a relatively small part of total production costs and accordingly its influence on the location of economic activity may not be decisive.

Secondly, while improved transport facilities generally make a less developed region more attractive for investment by increasing access to inputs and to markets for outputs, and by facilitating business travel, there are instances where improvements in transport have made it easier for firms in more developed regions to supply goods and services directly to poorer ones, with the potential to hinder the latter's economic development prospects (although it

is always difficult to assess the level of development which would have occurred in the absence of the investment). An extreme example of an area which combines a relatively high transport endowment with lagging development is the Mezzogiorno, while the opposite could be said to apply to Ireland or the Nordic regions.

It is clear that investment in transport alone will not lead to the reduction of development disparities. The success of improvements in transport depends on complementary efforts to ensure that the disadvantaged regional economies are in a better position to seize the opportunities created. The evidence suggests that in such a context, carefully selected investments in transport infrastructure in Greece, Spain, Ireland, and Portugal have had positive long-run effects on private investment and economic development in the regions, although there may be wide variations in final impact.

2.2.1.3.3 *Transport and environment*

The transport sector interferes widely with the quality of the environment. It generates air pollution, noise and land consumption (destruction of natural areas). There are however large differences in environmental impacts of transport modes and systems.

As stated in the Commission's November 2000 Green Paper on security of supply, in 1998 energy consumption in the transport sector was to blame for 28 % of emissions of CO₂, the leading greenhouse gas. According to the latest estimates, if nothing is done to reverse the traffic growth trend, CO₂ emissions from transport can be expected to increase by around 50 % to reach 1 113 billion tonnes in 2010, compared with the 739 million tonnes recorded in 1990. Once again, road transport is the main culprit since it alone accounts for 84 % of the CO₂ emissions attributable to transport.

The growth in transport over the last decades has led to the construction of more and more infrastructure. Such supply-driven policy can no longer be the only response to the problem of growing congestion. Building infrastructure has, furthermore, a considerable cost and, especially road, is far from being neutral in its effects on the environment, human health, the land take and the general well being of the population. Every day, another 10 hectares of land are covered over by new roads. Road-building has been particularly intense in the regions and countries furthest from the centre, as a means of helping their economic development, and particularly in the cohesion countries, where motorway density increased by 43 % in the 10 years from 1988 to 1998, though it remains below the Community average. Taking the Union as a whole, the number of kilometres of motorway trebled between 1970 and 2000.

2.2.1.3.4 *Transport and technological development*

Technological development interferes widely with the transport sector. It is not possible to provide an exhaustive overview of all fields of interaction.

Major innovations by transport mode

In the railway sector, a major technological jump has been the introduction of high speed trains twenty five years ago. This new technology is playing a strategic part in the revival of railway passenger transport in Europe. In terms of territorial impacts, it has benefited so far mainly to European central regions with a few exceptions (Andalusia). The projects presently in the pipeline will benefit also to a number of peripheral regions (Portugal, Spain, Italy, east-Germany). New technologies are also emerging, such as the magnetic levitation, which should find concrete applications in the coming decades. The motor car transport

benefits from various technological innovations. Some are related to engines and their fuelling (energy saving engines, biofuels, hydrogen fuel cells, electric engines etc.), others to the reduction of air pollution, to the increase of security, to navigation systems etc. A major element of innovation in motor cars and trucks is to be found in electronic systems and applications. The aircraft sector benefits from innovations in the propulsion systems (energy savings, lower noise level), in security systems, in materials etc; Airplanes with very large transport capacity are entering the market. Innovations in electronic systems and applications also play a considerable part in airborne transport. In the sector of maritime transport, technological innovations concern new types of ships (catamarans, high-speed ships, self-loading ships etc.), security systems (for instance double-hull tankers), propulsion systems (gas turbines etc.).

Intermodality for passengers and freight

Intermodality for passengers and freight requires specific physical infrastructure and services. Technological innovations concern both fields, and in particular the exchange of information, automated procedures and integrated services. Intermodality for travellers means providing appropriate services, especially baggage handling. Such services include the possibility to check in for a flight at a station (integrated ticketing). Services of integrated baggage handling are currently at the test stage. Innovative and efficient services of this kind should help reduce congestion problems in some of Europe's main airports and improve the punctuality and quality of passenger transport. In the field of freight transport, electronic data interchange and telecommunications are essential to facilitate and integrate operations, since many different parties are involved in intermodal transport chains (tracking and tracing of goods). Automated terminal operations are also contributing to the efficiency of intermodal freight transport.

Intelligent Transport Systems

Technological innovation is particularly strong in the field of Intelligent Transport Systems (ITS). ITS use information and communication technologies to facilitate the seamless transport of people and goods. Three main issues are addressed by ITS:

- Congestion. Bottlenecks on the main international routes remain a major problem, while urban and inter-city congestion requires immediate action;
- Pollution and health. The emission of harmful gases is now widely recognised as a real danger for the future of mankind. Breathing problems are on the increase in urban areas, while increasing traffic congestion is making life more and more stressful;
- Safety. Road transport is by far the most costly mode in terms of safety, claiming 40 000 lives every year in Europe.

Main technologies in the context of ITC are:

- Satellite navigation systems: It is now becoming part of a more general concept ('infomobility'), where users receive information tailored to their needs and pertaining to their precise location. The proliferation of communication networks and GIS, together with the overall decrease of cost, size and power consumption of satellite navigation receivers have driven the market towards high-volume consumer applications. The European contributions to satellite navigation infrastructures (EGNOS and GALILEO) will trigger the expansion of the market by providing decisive positioning performance improvements and will secure safety applications and financial investments by granting services guarantees and clarity regarding liability.

- Travel information and planning. They provide road travellers with up-to-the-minute information and forecasts concerning traffic and weather conditions and helping people plan their trips more efficiently before they leave their homes. Once en route, real-time information systems can warn travellers of traffic delays, incidents or accidents, with guidance systems helping people to choose alternative or optimised routes. ITS provides both road and public transport operators with more accurate and on-time information on the situation on their networks, making it easier to inform travellers and provide alternative solutions. Some concrete examples are:

- traffic-signal control systems in cities that automatically adjust themselves to optimise traffic flow, giving right of way to public transport;
- highway management systems providing information to motorists, recommending optimum speed for instance, thus increasing capacity and flow, and minimising congestion due to accidents;
- GALILEO-based locating devices and equipment monitoring systems for transport fleets;
- electronic toll collection, providing drivers with convenient and reliable automated transactions, improving traffic flow at toll plazas;
- electronic fee payment enabling a person to pay for parking, bus and train fares as well as tolls, with a single smart card;
- railway level crossings coordinated with traffic signals and train movements;
- regional multimodal information systems that provide road and transit information to travellers.

- Improving transportation for the elderly and people with disabilities. ITS has the potential to improve the accessibility and efficiency of public transport by the provision of pre-trip information and of real-time information during a journey. The use of 'smart' payment cards and cards that provide details of traveller requirements to operators will help to reduce barriers to all travellers, especially those with physical disadvantages.

- Freight and fleet management. ITS vehicle-tracking systems are being adopted widely by commercial fleet operators, such as delivery companies and public transport providers, as a means of streamlining mobile operations. By equipping all fleet vehicles with a location device that broadcasts positions to a control centre, managers can optimise fleet deployment, saving time and money and improving customer service. ITS will also greatly assist in the 'modal shift' of freight from road to rail, as proposed in the transport White Paper. The fundamental objectives of improving freight and fleet management are:

- reduction of trips made with empty or sparsely loaded cargo/passenger holds;
- optimising the distance travelled, so as to minimise the impact of vehicles on traffic flow and the environment;
- incident management programmes that enable response to accidents or breakdowns with the best and quickest type of emergency services, minimising clean-up and medical response time.

- Electronic fee collection. Electronic fee collection (EFC) can save road travellers time and frustration, allowing them to drive non-stop through tolling areas.

- Transport safety, emergency and incident handling. Applications are for instance: intelligent speed adaptation, driver monitoring, rapid response to emergency, tunnel safety etc.

- Management of urban transport.

Globally, the objectives of ITS within the urban context are:

- improving public transport information, i.e. routes, schedules, prices, etc.;
- allowing pre-planning of urban journeys, including parking;
- promoting other means of transport, for example providing cycle-path information;
- allowing journey modification while in progress, through information panels or via GSM;
- payment for services via smart card or GSM.

More specifically with respect to road applications, the objectives are:

- panels informing travellers about available 'park and ride' sites;
- traffic management, modifying signalling to improve traffic flow, giving public transport and emergency vehicles priority, modifying the direction of one-way streets during peak periods;
- travel-time information on highway roadsides;
- guidance systems allowing route modification during rush hours;
- parking and shuttle buses for tourists;
- location and identification of stolen vehicles using transmitting beacons or smart badges;
- limiting access to urban centres through badges or tolls.

Mobility and exchange of information

At the beginning of the 21st century, we are entering the age of the information society and virtual trade, this has done nothing to slow down the need for travel; indeed, the opposite is true. Thanks to the Internet, anyone can now communicate with anyone else and order goods from a long way away, while still enjoying the option of visiting other places and going to see and choose products or meet people. However, information technologies also provide proof that they can sometimes help reduce the demand for physical transport by facilitating teleworking or teleservices.

2.2.1.4 Forecasts, projections, scenarios

2.2.1.4.1 *Baseline scenario (European energy and transport trends to 2030)*¹⁴

The projected growth of transport activity, both in terms of passenger and freight transport, in the EU-15 strongly dominates the overall picture at the EU-25 level in 2000, the EU-15 accounted for 91 % of overall passenger activity and 87% of freight transport activity. The evolution of transport activity in EU-25 indicates a moderate decoupling between transport activity and economic growth. The decoupling between passenger transport activity, growing by 1.5% pa in 2000-2030, and economic growth is much more pronounced and starts from the beginning of the projection period. This can be explained by the fact that, at some stage, human mobility is expected to experience some saturation.

On the other hand, the decoupling of freight transport activity (growing by 2.1 % pa under Baseline assumptions in 2000-2030) and overall economic activity is projected to be significantly less pronounced, occurring mainly in the long run. The structural shifts of the EU-25 economy towards services and high value added manufacturing activities are the main drivers for this trend.

¹⁴ European energy and transport. Trends to 2030. European Commission. January 2003

The structure of passenger transport activity is projected to undergo significant changes under Baseline assumptions, with trends that prevailed in the last decade continuing over the projection period. Air transport is the fastest growing transport mode over the projection period, accounting by 2030 for 10.8% of passenger transport activity compared to 5.4% in 2000.

Public transport modes (public road and rail transport accounted for 42% of passenger transport activity in 1990) are projected to continue having a more important role in satisfying passenger transport activity in new member/accession countries over the projection period compared to the EU15. In contrast, the contribution of air transport activity, though increasingly significantly in new members/accession countries, remains even by 2030 at levels well below those projected for the EU-15.

The structure of freight transportation is also projected to change considerably in the future. Road transportation gains significantly in terms of market share at the expense of rail: the share of trucks increases from 69% in 2000 to 77.4% in 2030. Rail transport, although still increasing in absolute terms after a significant decline in the 1990s (+0.7% pa in 2000-2030 compared to -1.8% in 1990-2000), falls from 17.1 % of total freight transport in 2000 to 11.2% by 2030. The share of inland navigation is also projected to exhibit a continuous, though limited, decline over the projection period. As in the case of passenger transport activity, the evolution of freight transport activity in new member/accession countries exhibits some differences compared to the EU-15. Thus, starting from a much higher share for rail freight transport in 2000 (43% of total freight activity compared to 13% in the EU-15), new member/accession countries are projected to remain heavily dependent on rail over the projection period. In 2030 some 24% of freight transport activity in new member/accession countries is satisfied by rail transport, whereas in the EU-15 the corresponding share is limited to just 9%.

2.2.1.4.2 White paper 2010' scenarios¹⁵

2010. Option A:

The first approach (A) would consist of focusing on road transport through pricing alone. This option would not to be accompanied by complementary measures in the other modes of transport. In the short term it might curb the growth in road transport through the better loading ratio of goods vehicles and occupancy rates of passenger vehicles expected as a result of the increase in the price of transport. However, the lack of measures to revitalise the other modes of transport, especially the low gains in productivity in the rail sector and the insufficiency of infrastructure capacity, would make it impossible for more sustainable modes of transport to take over the baton.

2010. Option B:

The second approach (B) also concentrates on road transport pricing but is accompanied by measures to increase the efficiency of the other modes (better quality of services, logistics, technology). However, this approach does not include investment in new infrastructure and does not cover specific measures to make for a shift of balance between modes. Nor does it guarantee better regional cohesion. It could help to achieve greater uncoupling than the first approach, but road transport would keep the lion's share of the market and continue to concentrate on saturated arteries and certain sensitive areas despite being the most polluting of the modes. It is therefore not enough to guarantee the necessary shift of

¹⁵ White Paper. European transport policy for 2010: time to decide. European Commission. 2001.

balance and does not make a real contribution to the sustainable development called for by the Gothenburg European Council.

2010. Option C:

The third approach (C), on which the White Paper is based, comprises a series of measures ranging from pricing to revitalising alternative modes of transport to road and targeted investment in the trans-European network. This integrated approach would allow the market shares of the other modes to return to their 1998 levels and thus make for a shift of balance from 2010 onwards. This approach is far more ambitious than it looks, bearing in mind the historical imbalance in favour of road for the last 50 years. It is also the same as the approach adopted in the Commission's contribution to the Gothenburg European Council which called for a shift of balance between the modes by way of an investment policy in infrastructure geared to the railways, inland waterways, short sea shipping and intermodal operations (COM(2001) 264 final). By implementing the 60-odd measures set out in the White Paper there will be a marked break in the link between transport growth and economic growth, although without there being any need to restrict the mobility of people and goods. There would also be much slower growth in road haulage thanks to better use of the other means of transport (increase of 38 % rather than 50 % between 1998 and 2010). This trend would be even more marked in passenger transport by car (increase in traffic of 21 % against a rise in GDP of 43 %).

2.2.1.4.3 TEN-STAC scenarios

The objective of the TEN-STAC study was to produce updated transport scenarios, European traffic forecasts and detailed analyses of corridors of the trans-European network, including the new member and accession countries. This work is based on the Commission's proposal made on 1 October 2003 (see COM(2003) 564 final). In the first phase the base year 2000 has been consolidated from modelling and data point of view. Three scenarios have been designed in such a way that they catch the effect of infrastructure policy on the development of the transport systems, traffic flows and related impacts for year 2020. Additional to the tasks mentioned, national plans have been reviewed in phase 1. In the second phase, the priority projects have been analysed in detail in order to derive indicators that describe the performances and impacts of the priority projects, which each consist of multiple sub-sections. The detailed analysis of the impacts takes place on this level.

Three scenarios are defined for the horizon year 2020: TREND+, EUROPEAN, EUROPEAN+. All scenarios incorporate the same common socio-economic assumptions, meaning a 'normal' economic development in all countries is considered:

- In the TREND+ scenario, basic policy actions are used to ensure the realisation of the White Paper aimed at the continuing liberalisation and harmonisation of EU transport for 2020. The infrastructure projects globally included in the TREND+ scenario mainly consist of the projects to be finalised in the year 2007.

- The EUROPEAN scenario includes a number of assumptions in addition to those in the TREND+ scenario. In this scenario, White Paper measures are not only applied globally, but also specifically on the trans-European Network and on specific infrastructure projects. The focus in the EUROPEAN scenario is on the accompanying measures dedicated to the selected infrastructure projects in order to support the intermodal transport. This scenario globally includes the infrastructure projects that will be finalised in the year 2013.

- The EUROPEAN+ scenario includes all the assumptions of the EUROPEAN scenario. In addition, the accompanying measures have been intensified and all infrastructure projects are included that are planned to be finalised in the year 2020.

The transport forecasts generated within TEN-STAC reveal considerable growth rates of transport performance in the EU27 countries between the base year 2000 and the 2020 TREND+ scenario: 31% for passenger (passenger-km) and 75% for freight transport demand (ton-km). The total transport performance, both for freight and for passenger, is expected to increase slightly along the forecast scenarios TREND+ EUROPEAN – EUROPEAN+, with a disproportionately strong increase in the market segment of international traffic, particularly international rail transport. The growth of traffic demand along the three forecast scenarios goes along with the assumption of an increasing dimension of infrastructure investments along these scenarios. The effect of demand growth along the three forecast scenarios is mainly caused by two effects: Firstly, the number of long-distance passenger trips tends to increase slightly along the forecast scenarios TREND+, EUROPEAN, EUROPEAN+. Secondly, routings for some O/D relations change and are shifted to the new or upgraded infrastructure sections, representing a longer distance, which finally results in a higher transport performance.

In the TREND+ scenario, remarkable high is the growth in passenger transport on the North-south axis in France and from France to Spain. In freight transport, these axes are growing too; however the growth is large on other international axis in Western Europe and between Western and Central Europe as well. The difference between the EUROPEAN and the TREND+ scenario is a result of new infrastructure and the effect of the additional measures in the White paper. Especially in Eastern Europe new road infrastructure attracts additional road traffic; this over-compensates some sections of the general trend of a modal shift change towards rail due to the specific measures of the White paper and the new rail infrastructure. Examples of axes containing additional growth are the North-south and East-west routes in Poland.

The differences between the EUROPEAN+ scenario and the EUROPEAN scenario are limited and mainly restricted to the effects of new infrastructure in the new member/accession countries and the magnitude of the toll systems. The new road projects attract additional traffic, both in passenger and in freight transport. Moreover some rerouting of international transport can be noted to avoid high tolls. As an example this will cause additional north-south transport in the Baltic States and Poland to avoid tolls in Germany.

Freight

The total interregional aggregated freight transport demand (total of all modes) is the same in all the forecast scenarios. The main difference between the TREND+, EUROPEAN and EUROPEAN+ scenario is the modal share, which is changed due to the general policy measures and specific, infrastructure project related, accompanying measures that have been considered.

For the period up to 2020 the most important expected changes in freight transport are:

- high growth rates of road transport in relation with the new member/accession countries, both for the transport on the relation EU 15 – CEEC 12 as well as on CEEC 12 international relations;
- stabilisation of the market share of road freight transport in the E U15+2 region;
- comparatively high growth rates of volumes of so-called manufactured goods (which are mostly transported by road).

Although within the EU modal shares seem to stabilise, there are no indications in the forecasts that the present market shares of road freight transport will decrease significantly. Moreover in domestic and international transport in the CEEC 12 region the market share of road freight transport is expected to increase dramatically. Under these circumstances the challenge for modal shift policy takes on a new dimension.

The main gain of rail in the EUROPEAN scenario compared with the TREND+ scenario is on the domestic and international market of EU 15: 116 Mio tonnes on domestic markets and 18 Mio tonnes on the international market. This conclusion is drawn based on the analysis of trade flows, thus rail gains in reality more on the international market especially on port related flows. This trend is continuing in EUROPEAN+ scenario: rail benefits more due to the complementary accompanying Measures considered, supporting the implementation of the improved rail infrastructure and services.

In freight traffic, growth is concentrated on several main axes. On the secondary network stagnation can be noticed. Specific growth can be seen at links connecting harbours, in Western Europe as well as in several accession countries (Poland, Baltic States).

Passengers

For passenger transport the main concern is the high growth of air transport (especially business related travel) and (more limited) long distance travel by car (especially tourism). Both transport by car and air transport have a strong negative impact on the environment.

The growth in rail passenger traffic is most significant on the axes where new infrastructure will be opened and on the High speed network that already exists. The main examples of axes with high growth are found in France, Spain, Germany and on the international high speed network connecting Belgium.

Time cost savings

As far as the economic effects are concerned, for most impact variables an increase in cost savings for interregional traffic can be recognised along the scenarios TREND+ - EUROPEAN - EUROPEAN+. As regards the potential changes in time costs, i.e. changes in time costs under ideal conditions, substantial cost savings can be expected in all three forecast scenarios, for all land-based modes and for both passenger and freight.

The infrastructure assumptions in all three forecast scenarios are capable of enabling substantial potential time savings for passenger and freight interregional transport in Europe. The level of gains in potential time savings increases along the scenarios TREND+ - EUROPEAN - EUROPEAN+. In the EU member states, time savings, especially for passenger transport, are substantially driven by the completion of several high-speed rail connections, whereas the potential time savings for the new member/accession and the candidate countries are due to large investments in both land-based modes rail and road. Modal shift is stabilised in particular on international market segments where road growth is reduced.

Passenger

The potential time savings for passenger transport in the EU27 varies by more than 4.8 billion per year between the TREND+ and the EUROPEAN+ scenario. For member states, the assumed investments in new high-speed rail infrastructure result in large potential time savings. The potential time savings in new member/accession countries are caused by substantial improvements of both rail and road infrastructure.

In comparison with the TREND+ scenario, the results for the EUROPEAN scenario display substantial further gains from travel time savings. Regions in Northern Italy, particularly Lombardy gain from various major rail infrastructure investments, like the finalization of the high-speed link between Lyon and Turin, the Gotthard base tunnel and the new Simplon-Lötschberg tunnel, as well as partly from the Brenner base tunnel. Oberbayern profits from the completion of priority project P01 Berlin – Verona and from the high-speed link between Paris and Vienna, via Strasbourg, Stuttgart, Munich and Salzburg. In the latter project also the French regions Alsace and Lorraine, the German region Stuttgart and the Austrian regions Wien and Oberösterreich highlight with considerable travel time savings. The regions in the southern part of Sweden and Finland profit from the completion of the Nordic triangle, the Spanish regions Pais Vasco and to a lesser extent also Cantabria from a completion of the Atlantic branches of the priority project P03, whereas Slovak, Polish and Czech regions gain from implementations of TINA corridor sections.

The results of the EUROPEAN+ scenario represent the strong infrastructure investments assumed in CEEC, which leads to large gains in many Polish, Czech, Slovak and – to a lesser extent Hungarian regions. The assumption of a high-speed rail link between Madrid and Lisboa results in considerable profits in the region Lisboa e Vale do Tejo; the new high-speed link between Paris and the Spanish border via Bordeaux in the region Aquitaine, whereas the new bridge across the strait of Messina and the new high-speed rail link between Mulhouse and Lyon generate only comparatively low gains in the regions Sicilia and Franche-Comte.

The regions expected to gain the most from the infrastructure assumptions of the EUROPEAN+ scenario are situated along a tie, which covers the North-Eastern part of Spain, the whole French Mediterranean coast, Northern Italy and the Italian Mediterranean coast until Campania, Austrian and Slovenian regions, the German region Oberbayern, most of the Slovak, Czech and Polish regions and Lithuania.

Freight

Especially the CEEC 12 countries benefit comparatively intensely from the assumed investments in the EUROPEAN and the EUROPEAN+ scenario. The CEEC 12 countries gaining the most from the assumptions on transport infrastructure improvements in the EUROPEAN+ scenario are Poland (rail and road), Romania (rail), Bulgaria (rail), the Czech Republic (road) as well as the Slovak Republic (road). Within the group of the EU15 countries Portugal (rail and road) and Denmark (road) highlight with comparatively high rates of improvement of potential freight transport times in the EUROPEAN+ scenario, and – at a lower dimension – Finland, Germany, the UK, Austria, Belgium and Ireland for the road mode.

Impact of road congestion

The costs caused by road congestion are expected to increase considerably between 2000 and 2020 for the EU27 countries by around 7.8 billion (TREND+ scenario versus base year 2000). The results of the analysis of road congestion reveal differences between the TREND+, the EUROPEAN and the EUROPEAN+ scenario: for all countries and most of the regions there is a decrease in road congestion costs along the three scenarios. When comparing the costs caused by road congestion at a regional level, it can be recognised that in some regions the costs in the EUROPEAN+ scenario are higher than in the TREND+ scenario, which contradicts the general development of congestion costs within the forecast scenarios. This pattern can be explained by changes in route choice, especially of freight vehicles.

The conclusion can be drawn that infrastructure assumptions of the EUROPEAN+ scenario are more capable of limiting road congestion than those of the TREND+ scenario. However, the savings in costs caused by road congestion conceivable along the three forecast scenarios are not only due to the assumed road infrastructure investments, but also due to the investments in rail infrastructure, which are expected to shift a certain share of growth of transport demand to rail.

Environment

The environmental assessment reveals a differentiated evolution by the type of emission considered. Since by far the largest share of transport CO₂ emissions is generated by the road mode, the changes in total emission – covering road, rail and air – is largely influenced by the performance of road.

The results for the road emissions show the following pattern: due to the projected growth of road transport the CO₂ emissions are expected to increase considerably until 2020. Furthermore the road emissions tend to decrease along the scenarios TREND+ - EUROPEAN - EUROPEAN+, for EU 15 countries more clearly than for CEEC 12. This effect is caused by the following item: For most of the new member and accession countries, heavy investments in the road infrastructure are assumed in the EUROPEAN and EUROPEAN+ scenarios, which do not only result in induced demand, but also to a change in routing of traffic flows.

A conclusion to be drawn from the assessment of road emissions is that for member states the infrastructure assumptions in the EUROPEAN and the EUROPEAN+ scenarios are capable of reducing the amount of road emissions. For the group of new member/accession countries however, the amount of CO₂ emissions is not expected to decrease significantly. This pattern is due to the fact that in member states the investments assumed have a much stronger focus on rail infrastructure rather than on road infrastructure. For new member/accession countries huge investments are also allocated to road, which leads – owing to the discussed effects – to the slight impact on CO₂ emissions in EUROPEAN and EUROPEAN+ scenario in relation to the TREND+ scenario.

Due to assumed improvements in engine technologies and a more widespread use of soot filters, the road transport sector's emission volumes of NO_x and particulates are forecasted to decrease. A strong growth is expected for air transport, together with a highly-developed engine technology, which does not allow the assumption of significant improvements of emission factors in the future. Therefore, the emissions of NO_x and particulates by the air mode are forecasted to increase substantially.

For the scope of EU27 countries the infrastructure assumptions of the EUROPEAN and the EUROPEAN+ scenario are capable of reducing the emission of CO₂, NO_x and particulates from interregional transport, compared to the TREND+ scenario. However, it has to be considered that the environmental assessment made at European level does neither take into consideration damages caused by the infrastructure itself, nor allows conclusions on whether the EUROPEAN and the EUROPEAN+ scenario is capable of improving the situation for people and environment, since the level of concern caused by emission of particulates against the background emissions has not been considered. The considerable growth in the transport sector's CO₂ emissions in all three forecast scenarios compared to the base year situation demonstrates an evolution being in contrast to European policy goals. As far as the emissions of CO₂ are concerned, the policy assumptions in the three forecast scenarios are not far-reaching enough in order to provoke a significant reduction. For a bigger reduction in CO₂ emissions, further policy measures are required that both foster technical developments and set further incentives for attaining additional modal shifts.

The results for the environmental assessment impressively reveal differences between the member states on the one hand and new member/accession countries on the other. For both the EU 15 and the CEEC 12, there is an increase in emission of CO₂ and the decrease in emission of particulates. However, the dimension of decrease and increase differs significantly. This pattern is explained by the differences in growth rates of transport demand and, to a lesser extent, by route shifts of heavy goods vehicles, especially in the EUROPEAN+ scenario. When comparing the results among the three forecast scenarios at EU27 level, a decrease of emission loads along the three forecast scenarios can be recognised. The improvement of the overall emission situation in the EUROPEAN and the EUROPEAN+ scenario is caused by the assumption on a higher share of electrical locomotives in these two scenarios, as well as by the effects of a higher share of fluent traffic situations on the CEEC 12 road network. For the scope of the EU27 countries the infrastructure assumptions in the EUROPEAN and EUROPEAN+ scenario (which at least for member states have a clear emphasis on the rail mode), are capable of reducing the emissions of CO₂, NO_x and particulates.

Accessibility, integration, cohesion

The infrastructure assumptions in the EUROPEAN and the EUROPEAN+ scenario contribute to further integration and cohesion within an extended European Union. This pattern is represented by a disproportionately strong increase in international traffic demand – especially rail – along TREND+, EUROPEAN, EUROPEAN+. Furthermore, in terms of centrality many peripheral regions gain relatively strongly from the transport infrastructure measures, compared to regions that form the present European gravity centres in terms of inhabitants and economic power. These effects presume positive effects on the further development of an internal market. For peripheral regions in the northern part of Finland and Sweden as well as several Greek regions, whose centrality position for rail and road is not enhanced substantially by the infrastructure assumptions for these two modes, the modes air and short sea shipping (sea motorways) play an important role for an improvement of their centrality.

The results of the assessment on regional centrality for passenger transport reveal strong improvements for regions in the United Kingdom and Ireland in the TREND+ scenario compared to the base year situation 2000. This striking pattern is due to the fact that completion of the high-speed rail access from London to the Channel Tunnel has been assumed in the TREND+ scenario, which results in the effect that several, densely populated areas of continental Europe can be accessed from London and the Southern part of the UK directly by high-speed rail connections. When comparing the results for the three forecast scenarios, significant improvements can be recognised along the scenarios TREND+, EUROPEAN, EUROPEAN+. Regions in Spain, the southern part of France, Italy and some regions in Sweden and Finland clearly show an increase in centrality in the EUROPEAN scenario, which is caused by the assumed completion of the priority projects.

The infrastructure assumptions in the EUROPEAN+ scenario result in further improvements in centrality, e.g. in Portugal, whose regions gain from a new high-speed link between Madrid and Lisboa; Denmark, north German regions and regions in Sweden and Norway from the fixed link above the Fehmarn belt; Polish, Czech, Slovak, Hungarian and Bulgarian regions, as well as the Baltic countries from the intense investments in the road and rail network according to the TINA planning.

The results for the centrality indicator for freight transport illustrates Baltic, Polish, Czech, Slovak, Hungarian, Romanian and Bulgarian regions highlighting with substantial gains of centrality from the infrastructure assumptions in the EUROPEAN and EUROPEAN+ scenario together, but at a lower dimension, with Swedish and Finnish regions, whereas the impacts on regions the economic gravity centre of Europe are negligible, like in the Benelux

countries, some regions in the western part of Germany and regions in the northern part of France. Generally speaking, the dimensions of the relative changes are larger for peripheral regions than for regions in a central position within Europe. Since for the centrality calculation for freight generalised transport costs are underlying, in some of those countries, for which an increase in motorway charges for heavy good vehicles has been assumed in EUROPEAN and EUROPEAN+, freight transport time savings are overcompensated by an increase in other cost components.

Finally, the EUROPEAN scenario and to a greater extent the EUROPEAN+ scenario show rerouting of traffic, with increase of traffic in new member/accession countries potentially with a pro-cohesion effect and decrease of road transit traffic in central countries where modal rebalancing is seen with a higher priority.

Impacts of individual projects

The infrastructure projects considered within TEN-STAC include the list of priority projects (see COM(2003) 564). When speaking of 'project appraisal' and 'impacts of projects' one generally refers to answers to the following questions:

- What will be the changes in the size, composition, modal split and spatial distribution (routing) of future transport flows as a consequence of the realisation of the infrastructure project(s)?
- What are the changes in the use of transport infrastructure networks as a consequence of the realisation of the infrastructure project(s)?
- What are the benefits for the economy and society of the changes in transport flows and network use of the realisation of the infrastructure project(s)?
- What is the dimension of these benefits for the society compared to the costs for the realisation of these projects?

2.2.1.4.4 ESPON simulations and scenarios (SASI model)¹⁶

Transport policies have important territorial impacts, in particular through the development of infrastructure and through the pricing policy. Impacts are mainly identified on accessibility and regional economic development. The analysis of territorial impacts of the EU Transport and TEN policies has been carried out on the basis of 10 scenarios. The results of the application of the SASI model are presented hereafter. The ten policy scenarios are the following:

| Policy scenario | Transport characteristics |
|------------------------------|---|
| A1 Infrastructure | Implementation of all rail projects 1991-2001 |
| A2 Infrastructure | Implementation of all road projects 1991-2001 |
| A3 Infrastructure | Implementation of all projects (road and rail) 1991-2001 |
| B1 Infrastructure | Implementation of all most probable rail projects 2001-2021 |
| B2 Infrastructure | Implementation of all most probable road projects 2001-2021 |
| B3 Infrastructure | Implementation of all most probable projects (road and rail) 2001-2021 |
| C1 Pricing | Reduction of the price of rail transport |
| C2 Pricing | Rise in the price of road transport |
| C3 Pricing | Social marginal cost pricing of all transport modes |
| D Pricing and Infrastructure | Implementation of all projects 2001-2021 and marginal cost pricing of all transport modes (B3 + C3) |

¹⁶ ESPON Study 2.1.1. Territorial impacts of EU Transport and TEN policies. Coordination: Institut für Regionalforschung. University of Kiel. 2004.

The retrospective scenarios A1-A3 analyse the spatial impacts of transport policies already implemented. The prospective scenarios B1-D are to analyse the likely effects of possible future transport policies.

Accessibility is improved in all A and B scenarios, as these assume infrastructure investments and improvements compared with their respective reference scenarios. Scenario C1, in which rail transport fares are reduced, results in an increase in accessibility, and scenarios C2 and C3, in which transport prices are increased results in a reduction of accessibility. The relatively large differences in accessibility translate into only very small differences in GDP per capita. Despite the huge transport investments in some scenarios, no region gains more than a few percent in GDP per capita as a consequence of these investments – and this over a period of one (in scenarios A1-A3) or even two decades (in scenarios B1-D). The huge investments for the Trans-European Transport Networks (TEN-T) have not brought much overall economic growth to the member states of the present European Union (EU15) in the past (scenarios A1-A3), nor are they likely to do so in the future (scenarios B1-D). The effects for the candidate countries (CC12) are much larger. In the future those for the candidate countries are even larger because of the expected implementation of the TINA projects.

In both the past and the future, the effects of road infrastructure projects on development potential (scenarios A2 and B2) are significantly larger than those of rail infrastructure projects (scenarios A1 and B1). In the years 1991-2001 only few new high-speed rail lines were opened in scenario A1, mainly in France and Spain; therefore the relative effect for the candidate countries was negative. Rail scenario A1 in the past decade favoured mostly central European regions, whereas road scenario A2 had a clear cohesion effect (in relative terms). Because the effects of road infrastructure investments were much stronger, scenario A3, in which both road and rail projects were implemented, is very similar to scenario A2. The prospective infrastructure scenarios have a pro-cohesion effect (in relative terms) with the strongest effects in scenario B3, in which all road and rail TEN and TINA projects are assumed to be implemented.

As far as pricing scenarios are concerned, a reduction of rail fares (scenario C1) has similar effects as building infrastructure. It advantages numerous regions with peripheral character, but also a number of regions with more central character. It has therefore a rather positive impact on cohesion, but with some exceptions. Its global impact on the economy of regions is however modest.

The two pricing scenarios with cost increases (scenarios C2 and C3) have global negative impacts on the economy of regions (GDP is decreasing everywhere) because they increase the cost of trade and mobility, but the negative impact is generally stronger in less developed regions (northern periphery, western parts of the Iberian Peninsula, northern parts of Scotland and Ireland, southern Italy), although less negative impacts on the development potential will occur in the eastern part of EU-27 (new member/accession countries) and in the inner part of the Iberian Peninsula and France. . The two pricing scenarios with cost increases (scenarios C2 and C3) increase disparities in accessibility but the effects in both relative and absolute terms are very small. These scenarios are globally not favourable to cohesion, with some exceptions.

2.2.1.4.5 Projections of energy demand in transport¹⁷

In the last decade energy demand in the EU-25 transport sector grew at a rate of 2% pa and is projected to grow further at rates above average (+1% pa in 2000-2030) under Baseline assumptions, though at a decelerating pace over the projection period. By 2030 the transport sector (excluding marine bunkers) is projected to account for 32.3% of final energy demand in EU-25 compared to 31 % in 2000. Energy consumption for passenger transport is projected to grow by 0.4% pa in 2000-2030 compared to an increase of 1.9% for freight transport. The projected growth of energy consumption in passenger transport is significantly lower than the growth of transport activity (+ 1.5% pa in 2000-2030), implying a substantial improvement of energy intensity (energy consumption per passenger-km) by 1.0% pa (compared to a worsening of -0.1 % pa observed in 1990-2000). It is important to note, however, that the trend observed in the last decade was solely due to the structural changes in new member/accession countries towards the use of private cars, which resulted in a worsening of energy intensity by 2.5% pa.. In the same period the EU-15 experienced a limited improvement of energy intensity by 0.1 % pa. In any case, the projected improvement under Baseline assumptions is all the more impressive in view of the further shift towards aviation, which is the most energy intensive transport mode, and the growing size and comfort levels of cars in future.

Energy intensity gains in freight transport are significantly lower (0.25% pa) as energy consumption is likely to increase by 1.9% pa in 2000-2030 following, however, a worsening of freight transport efficiency (-0.4% pa) in the nineties resulting from the shift towards trucks and away from rail in new member/accession countries.

The shifts to different transport modes both for passenger and freight transport strongly affect the outlook for fuel consumption in the sector. Thus, consumption of kerosene is likely to grow at rates well above average (+ 1.6% pa in 2000-2030) driven by the increasing activity in aviation. The growing contribution of trucks, which are expected to continue to be predominantly reliant on diesel engines, in satisfying freight transport needs and a progressive dieselisation of the car fleet, lead to an increase of diesel oil demand by 1.4% pa. Gasoline demand, after peaking in 2020, experiences a negative growth afterwards as a result of the slowdown in passenger transport activity growth and the technological progress in private cars. Electricity demand is projected to grow by 0.4% pa in 2000-2030 driven by the further electrification of rail transport, while novel energy forms, such as methanol, ethanol and hydrogen, will grow quite rapidly but remain insignificant in absolute terms even by 2030. However, the role of biofuels as a blended ingredient of gasoline and diesel oil (i.e. as the fuel is available at the pump) is projected to become increasingly important in the long run. They reach a share of 5.1% of gasoline consumed in 2030 (2.0% in 2010) and 5.3% of diesel oil consumed in 2030 (2.4% in 2010).

Technological progress is of key importance in influencing the projected growth of energy consumption in the transport sector. Energy intensity of private cars is likely to exhibit an improvement of 31.2% in 2000-2030 (7.4% in 2000-2010 and 19.3% in 2010-2020), driven by the modernisation of the car stock combined with the effects of the EU-ACEA/KAMA/JAMA agreements. Rail electrification, which is projected to be completed by 2020 in the EU-15 but still continues in new member/accession countries, will lead to an intensity improvement of 38% by 2020 with additional progress in 2020-2030 limited to some 8.5 percentage points. Energy intensity improvements in aviation reach 22% in 2010 and 48.5% over the period to 2030, driven by the increasing aircraft needs, which in turn lead to faster renewal of the aircraft fleet with new, more efficient planes. For public road transport and inland navigation improvements in energy intensity are less pronounced and occur as a result of replacement of equipment and technological progress.

¹⁷ *European energy and transport. Trends to 2030.* European Commission. January 2003

Efficiency improvements in freight transport (-7.5% in 2000-2030) are significantly less pronounced compared to passenger transport, mainly because of the shift towards road freight that is a much more energy intensive activity compared to rail freight. Thus, this shift to less energy efficient modes largely offsets the significant intensity gains at the level of the different transport modes. More specifically, efficiency gains for trucks are likely to reach + 16% in 2000-2030 driven by better management and technological progress, whereas the improvement for rail freight reaches +44% as a result of the rail electrification, which is taking place over the projection period in EU-25.

2.2.1.5 EU transport policy

For a long time, the European Community was unable, or unwilling, to implement the common transport policy provided for by the Treaty of Rome. For nearly 30 years the Council of Ministers was unable to translate the Commission's proposals into action. It was only in 1985, when the Court of Justice ruled that the Council had failed to act, that the Member States had to accept that the Community could legislate. The first real advance in common transport policy brought a significant drop in consumer prices, combined with a higher quality of service and a wider range of choices, thus actually changing the lifestyles and consumption habits of European citizens. Main elements of EU transport policy are the realisation of the TEN-T, the liberalisation of transport, sustainable transport and mobility, transport security.

2.2.1.5.1 *Transeuropean Transport Network*

The inclusion in the Treaty of Maastricht of a Title for a policy on the trans-European networks gave the European Community competencies and the instruments for their development. In accordance with Article 154 of the Treaty establishing the European Community, the Community contributes to the establishment and development of trans-European networks in the sectors of transport, telecommunications and energy infrastructures. This is with a view to contributing to both the establishment of the internal market, and to economic and social cohesion. To do this it must firstly develop the interconnection and the interoperability of the national networks.

In the early 90's, the development of the trans-European network became a political priority as it was rightly considered as a supporting tool for the single market, which, with the opening of the internal borders, became a tangible reality on 1st January 1993. The Commission's 1993 White Paper on growth, competitiveness and employment consequently evoked the idea of drawing up a list of projects of Community interest together with a number of measures aiming at mobilising public and private actors. Based on the Commission proposals contained in its White Paper, the Brussels European Council of December 1993 adopted a series of important decisions to speed up the implementation of trans-European networks (transport, but also energy and telecommunication).

As regards transport, at its meetings in Corfu in June 1994 and in Essen in December of the same year, the European Council endorsed a list of 14 priority transport projects based on the report drawn up by the 'Christophersen Group'. It invited the Member States concerned to take all the measures necessary to advance these projects by in particular speeding up the administrative, regulatory and legislative procedures. Subsequently, on 23 July 1996, the European Parliament and the Council adopted Decision N° 1692/96/EC on Community guidelines for the development of the trans-European transport network, which included a much larger list of projects of common interest.

This Decision set 2010 as its target date for completing the network. The guidelines were intended to encourage the Member States, and if necessary the Community, according to its budgetary resources, to carry out projects of common interest aimed at ensuring the consistency, interconnection and interoperability of the trans-European transport network as well as access to this network. The guidelines put in a single reference framework the plans and criteria for each mode of transport, which has made it possible to identify projects of common interest likely to be eligible for the TENs budget or under financial structural instruments. Furthermore, the Decision incorporated within its Annex III the priority projects adopted by the Essen European Council. In fact, now, the priority projects endorsed by the Essen European Council represent only a part of the many projects of common interest.

The estimated cost of the whole trans-European transport network agreed in 1996 in the guidelines and in 2002 in the Accession Treaties, alone, amounts to nearly €500 billion for all the projects due initially to be completed by 2010, including €112 billion still to be invested for the priority projects agreed by the European Council of Essen. The work of the Group has shown that new additional needs for a time horizon of 2020, not yet identified in the guidelines, have now to be considered. Adding what needs to be completed to achieve past commitments and these new needs, we can estimate the total needs at nearly more than €600 billion until 2020.

The only concrete experience in defining main European axes stems from the Ministerial pan-European Conferences in Crete (1994) and Helsinki (1997) which identified 10 pan-European corridors in Central and Eastern Countries. This has proved to be a promising planning approach to coordinate investments as pan-European corridors are now widely used by the national administrations of new member/accession Countries, and by the Commission itself, not only to program financial aid but also to maintain coordination at policy level.

Pan-European corridors form part of a different institutional framework (intergovernmental cooperation) from the trans-European network (Community framework). They have played an important role, in particular because in the early 90', there was no network clearly established like in western countries. Today in the enlarged Union and the increased scope and complexity the trans-European network, the needs are different and require a different approach. The identification of trans-European axes aims at ultimately establishing a core network. Many of the Member States have identified corridors on their territory when preparing national transport infrastructure plans. The concept of a corridor is also increasingly used by rail operators and infrastructure managers (Magistrale Eco-fret, Belifret, etc.).

Some major projects have now been completed, such as Spata airport, the high-speed train from Brussels to Marseille and the Øresund bridgetunnel linking Denmark and Sweden. But in far too many cases, the national sections of networks are merely juxtaposed, meaning that they can only be made trans-European in the medium term. With enlargement, there is also the matter of connection with the priority infrastructure identified in the candidate countries ('corridors'), the cost of which was estimated at nearly EUR 100 billion in Agenda 2000.

A further crucial factor that has led to delays in the past has been the complexity of moving ahead with cross-border projects or co-operation, be it in the transport or research area. In transport there is a real need for an effective co-ordinator or coordination body, as recently proposed by the Commission, linked to particular projects that can push the project forward. Such a co-ordinator could help steer the evaluation of projects, synchronise administrative procedures and monitor the works on either side of the borders, help to

engineer the necessary financing and act as a contact point for private investors. However, for progress to be made, a temporary solution to coordination problems cannot wait for the legislation to have made its way through Council and the European Parliament. The Commission may provide facilities for Member States that are willing to organise their co-ordinated efforts with respect to specific cross-border sections of the TENs or to Motorways of the sea. Co-ordination of planning, environmental impact assessment, complex financial operations are the most likely, albeit not exclusive areas of intervention.

The Commission has identified the 'Quick-start Programme' of projects. These cover both a range of decisions and immediate actions to develop both the network and the knowledge strands of the European Initiative for Growth. For transport projects, these form part of the Priorities for TEN-transport and updated financing rules for transport and energy networks that the Commission has proposed on 1st October 2003.

These projects have been identified after assessing the following four criteria.

1. The **maturity of the project**. Quick-start projects are ones which are either ready to go or where that may soon be the case, both in terms of the project planning and the financing for the project. The aim is to ensure that substantial investment be underway before the end of 2006. In some cases, support via the European Initiative for Growth may help to unlock or accelerate progress. For example, by increasing the return to private capital, by reducing the requirement for national public funding or by ensuring that very costly technical preparatory work such as in depth technical studies are launched, it may allow for a rapid start of the works.

2. Its **trans-frontier dimension**, with a particular focus in transport links on the cross border segments of the TENs priorities⁵. This dimension is both politically and economically important. Cross-border segments constitute the fragile links in the construction of a fully integrated internal market in an enlarged Union and are often subject to long delays both because they may deliver a lower return on investment and are inherently more complex to co-ordinate. Moreover, it is these links which can often have a significant multiplier effect, improving the financial viability of other 'domestic' parts of TENs corridors or adding value to other infrastructure investment, for example, funded by the Structural Funds.

3. The **impact on growth and innovation in an enlarged European Union**. While the direct and indirect impact of these projects may sometimes be difficult to quantify, projects have been identified which are likely to support growth and jobs through the better integration and mobilisation of resources and by boosting the Union's innovative capacity by keeping it at the cutting edge of technological development from hydrogen to nanoelectronics and space.

4. The **benefits for the environment**. A preference should be given to projects offering strong environmental benefits. For example, projects linked to supporting a hydrogen economy, or shifting traffic from road to rail or from road to the sea. Moreover, the problems of pollution and congestion are often most acute at the bottlenecks within the European transport network which form natural barriers within our continent such as the Alps and the Pyrenees.

The Commission identified at the beginning of October 2003, 29 pan-European corridors as priority TEN-transport links requiring investment of €220 billion up to 2020. Those corridors are made up of a large number of segments. Within those segments, it has been possible working with the EIB and Member States to identify a number of **Quick-start Transport Projects** which involve investment of €38 billion between now and 2010. Using the Quick-start criteria, the links selected are predominantly mature cross-border rail connections, sea and inland waterways or road links interconnecting with other networks such as the

'motorways of the sea'. The **Galileo Satellite navigation system** is also supported. Many of these projects will be co-financed through a combination of programmed TENs support and Structural Funds at the level of the Union. They may also benefit from around €12-13 billion loans available from the European Investment Bank over the next three years, in addition to other support that the Bank may offer (e.g. guarantees or its new securitisation instrument).

2.2.1.5.2 Sustainable transport

In the new context of sustainable development, the Gothenburg European Council of June 2001 asked that, in future, stress should be laid on the development of rail, maritime and river transport. The Commission's White Paper on transport policy for 2010 also placed the re-balancing between different modes of transport at the heart of a sustainable development strategy.

This adjustment involves market measures enabling the discrepancies in competitiveness between the modes by putting them into a situation of fair and regulated competition within the internal market. In particular, this involves revitalizing rail transport, through the creation of a European railway area. Many regulatory initiatives taken since 2000 have also contributed to setting up stricter monitoring of road transport which, poorly controlled, fragmented and subject to fierce competitive pressure, must be encouraged to reorganize, particularly through more social and safety regulations.

Other measures facilitating the use of certain modes which are beneficial for the environment have been adopted: short sea shipping should benefit from a rationalisation of administrative and customs procedures, and inland navigation from the complete liberalisation of the sector. Alternatives to road transport were also stimulated by a series of actions in favour of intermodality, particularly the creation of a programme specially devoted to the promotion of substitute solutions (rail, inland waterways and short sea shipping) known as MARCO POLO (2003-2010), which followed on from a first programme named PACT.

In the field of protection against noise pollution from aircraft, a first directive dating from 1992, aimed at eradicating the noisiest aircraft ('chapter 2' aircraft according to the international classification) within the Union.

2.2.1.5.3 Liberalisation of the transport sector

The transport sector used to be one of the most protected economic sectors in the former European Economic Community. During the past two decades, the various transport modes were progressively liberalised: maritime transport, road haulage, inland waterway transport, air transport and presently railway transport. The opening up of the market for the international transport of goods has been a reality since 15 March 2003 on most international lines. From 1 January 2006 it will be extended to the entire rail network. One year later, on 1 January 2007, it will be the turn of national markets to open up to competition. This liberalisation should encourage investments and the development of new services. For passenger transport, the 'third railway package', presented by the Commission in March 2004, proposes a progressive opening up of the market. The first phase will affect international routes, where the high-speed network should be completed in 2010. Over time, thus, services like Thalys and Eurostar could face competition. This development would seem to be essential if the railways are to stand up to the growing pressure from low-cost airlines. Provision has been made for measures to accompany the different phases of this opening up of rail freight and passenger transport to competition. Community directives

also provide that different organisational entities should be responsible for transport activities and for infrastructure management. Following the example set in the electricity and gas sectors, this involves guaranteeing non-discriminatory access to the rail networks for the different operators. These networks, because of their structure as natural monopolies, act as entry points to the market. It is also necessary to regulate the essential functions of sharing out railway capacity, of collecting fees for the use of the infrastructure and of granting licences to companies.

2.2.1.5.4 Interoperability

Railways

The emergence of trans-European interoperable railway axes for specific market segments (e.g. high-speed and freight) should be seen as key to the success of international rail services. However, the huge diversity in signalling and in telecommunication systems constitutes a major obstacle to this goal. The current situation requires European standards for a new-generation of railway signalling and telecommunication systems to be implemented, such as the *European Rail Traffic Management System* which covers, on the one hand, the *European Train Control System* (the 'signalling' part) and, on the other hand, the *GSM-Railways* (the 'telecommunication' part). The Community has already adopted directives promoting technical specifications for interoperability. These specifications for highspeed rail were adopted in 2002 and are starting to be implemented. As regards the conventional rail system, these specifications still need to be further developed by the future European Rail Agency. A coherent '*Trans-European deployment strategy*' should reconcile the different national deployment blueprints.

Air traffic control

The role of the Community is to ensure that the development of the future air traffic management systems is properly organised and managed at the European level to ensure that the various elements are available and implemented system-wide in line with traffic growth. The Community thus proposed solutions to these problems, through the Single Sky legislative package to be adopted in 2003. The EU should achieve a 'European system' and not a collection of national systems, by setting up functional blocks of airspace and putting new concepts and technologies into practice. To achieve the Single Sky, the integration of air traffic services would require reconfiguration of air space into a limited number of functional blocks. This opens the way to consolidation of service provision and rationalisation and infrastructure. This would imply the development by 2008 of interoperability requirements for the existing systems and a standardised 'target' architecture for the future European air traffic management system and the progressive implementation of this target architecture in the national systems by 2015.

2.2.1.5.5 Links with neighbouring countries

Good connections with third countries have an important role in encouraging trade between the European Community and its neighbours, and thus promoting economic development.

The territory of Switzerland is located in the middle of the Union in an area characterised by a very high traffic density. The agreement of 21 June 2002 between Switzerland and the European Community envisages new Alpine rail links (NLFA) in Switzerland, and improvements on the territory of the Union of the capacities of the northern and southern access routes to the NLFA to the UIC C' gauge. These access connections were naturally included in List 1, in view of the Community's international commitments. The construction

of each of access tunnels to Switzerland will have to be taken into account in the implementation of the Community transport policy, in order to guarantee a coordinated vision of the development of the major traffic axes at the level of the European territory as a whole. This investment policy is necessary to promote intermodality in this sensitive area. It requires close coordination of programming in the construction timetable of the tunnels and of the access routes. It requires a complete view of the flows crossing the Alps in particular after enlargement.

The Balkans constitute another area of third countries located in the heart of Europe. Croatia has already submitted its application for membership of the Union in March 2003 and the strengthening of the connections with the whole area contributes to the stabilisation process. On the basis of the strategic plan established by the Commission for the development of the infrastructure in the Balkans, a number connections with a high European interest were identified, not only for the economic development and the stabilisation of the area, but also to give Member States in south-east Europe a better access to the central markets of the European Union. These projects with a high European interest are above all on the *Danube*. During the war in the 1990's several bridges on the Danube in Serbia were destroyed, blocking navigation. Pontoon bridges have now been set up but they still hinder normal navigation. A construction plan for new bridges has to be set up very quickly in order to restore sufficient navigability on this part of the Danube. Other important projects are the *motorway Ljubljana-Zagreb-Beograd-Nish-Skopje-Thessaloniki*, and the *motorway Budapest-Sarajevo-Ploce* to improve the access to the Adriatic Sea.

Several projects were identified as worth consideration to reinforce ties with Russia, Belarus and the Ukraine: the rail line (Helsinki)-Vainikkala-Saint Petersburg, the railway and road connections between the Baltic States and Russia/ Belarus, (Klaipeda-Vilnius-border with Belarus and Ventspils/Liepāja/Riga – border with Russia/Belarus; Tallin – Narva/Tartu – border with Russia), the motorway Zilina-Kosice (Ukraine); the road and rail connections Berlin – Warsaw – Minsk- Moscow-Nishny Novgorod (pan-European Corridor II); the road and rail connections Berlin/Dresden-Wroclaw-Lvov-Kiev (pan-European Corridor III); the road and rail connection between Budapest and Ukraine's border (pan-European Corridor V), the rail and road access to Kaliningrad, the connections to countries bordering the Black Sea.

There is also a pressing need to develop a Euro-Mediterranean-Transport Network which as much concerns North-South traffic as South-South regional traffic. In this context, special attention should be given to the connections to Turkey.

2.2.1.6 Summary of driving forces

Key factors behind the continued growth in demand for transport:

- for passenger transport, the determining factor is the spectacular growth in car use. The number of cars has tripled in the last 30 years, at an increase of 3 million cars each year. Although the level of car ownership is likely to stabilise in most countries of the European Union, this will not be the case in the candidate countries, where car ownership is seen as a symbol of freedom. By the year 2010, the enlarged Union will see its car fleet increase substantially.
- as far as goods transport is concerned, growth is due to a large extent to changes in the European economy and its system of production. In the last 20 years, we have moved from a 'stock' economy to a 'flow' economy. This phenomenon has been emphasised by the relocation of some industries — particularly for goods with a high labour input — which are trying to reduce production costs, even though the

production site is hundreds or even thousands of kilometres away from the final assembly plant or away from users. The abolition of frontiers within the Community has resulted in the establishment of a 'just-in-time' or 'revolving stock' production system.

- the progress of the economic integration in the EU, including the successive enlargements;
- in the case of air transport, the main factors of traffic development are the recent liberalisation as well as the related development of low-cost companies.
- introduction of new transport technologies, such as high-speed trains.
- the fact that transport users do not always cover the costs they generate. Indeed, the price structure generally fails to reflect all the costs of infrastructure, congestion, environmental damage and accidents.

Main factors of increasing congestion on a growing number of transport axes:

- saturation on some major routes is partly the result of delays in completing trans-European network infrastructure.
- the poor organisation of Europe's transport system and failure to make optimum use of means of transport and new technologies.

Main factors of territorial imbalance in accessibility:

- market-driven development of infrastructure. In outlying areas and enclaves where there is too little traffic to make new infrastructure viable, delay in providing infrastructure means that these regions cannot be properly linked in.
- low level of intermodality and of adapted transport services in the more remote regions.

Main factors of imbalance in transport modes:

- insufficient consideration of social and environmental costs generated by road traffic;
- insufficient competitiveness of alternative transport modes, such as railways, waterways and maritime transport.

2.2.2 Transport scenarios

Under the theme 'Transport', two prospective policy scenarios are presented, corresponding to rather opposite hypotheses, one favouring road transport as a response to existing and forecast demand, the second being orientated, on the contrary, towards the objectives of the Kyoto Agreement and of the Göteborg Strategy. These scenarios aim at illustrating the contradictory context in which the EU and its member states presently are, with some countries developing strongly their motorway networks to alleviate traffic congestion while the Kyoto Agreement has just been enforced and efforts have now to be developed to ensure sustainable transport.

2.2.2.1 Scenario: 'More investments in motorways'

2.2.2.1.1 Scenario hypotheses

European integration has been characterised by rapidly growing transport flows, both in the freight and passenger sectors. Available projections indicate that this trend is long-lasting and will be strengthened by the recent EU enlargement and by the forthcoming ones. Considering that modal split towards rail and maritime transport has not really been successful and that there is a clear trend in favour of road transportation in general, but in the new member countries in particular, the EU and national policies decide to make maximum use of the existing capacities of road transport infrastructure and to expand it. The traffic forecasts of the TEN-STAC study are considered as realistic and investments in the road sector should contribute to alleviate congestion with regard to strongly increasing transport flows. The scenario assumes that increase in fuel price will be moderate after 2005 and will not be detrimental to the development of road transport. This means that either increase of crude oil price will be moderate or, in case the price of crude oil will seriously increase, it will be compensated by a corresponding decrease of taxes on oil products.

2.2.2.1.2 Driving forces

Factors leading to the increase of road transport flows are, among others:

- the increasing mobility of people and the increasing rate of motorisation, in particular in the new member states of Eastern Europe;
- EU enlargements and further globalisation (intensification of economic exchanges); relocation of economic activities in the new member countries;
- delays in the extension and improvement of the TEN-T;
- insufficient competitiveness of alternative transport modes (railways, maritime transport);
- lack of success in decoupling economic growth from growth of transport flows

In the policy field, the driving forces are related to the expansion of the European motorway network and, more generally, to the optimisation of the use of the road/motorway networks as a response to the increase of traffic demand.

2.2.2.1.3 Contextual elements of the decision to increase investments in motorways

By 2006, the EU had for the fifth year a low rate of economic growth. The mid-term assessment of the Lisbon Strategy had revealed at the end of 2004 that the targets of European competitiveness were not to be reached without a serious reconsideration of the efficiency of EU policies, following in that some conclusions of the Sapir Report published in early 2003. The increase of the unemployment rate resulting from the progress of globalisation and in particular from the acceleration of enterprise relocation towards low-wage countries outside Europe, was a determining factor for the reconsideration of all EU policies as to their economic efficiency.

The EU Transport Policy was carefully and extensively examined. This examination revealed paradoxical aspects. On the one hand, the realisation of a Transeuropean Network and the liberalisation of transportation had been considered at the time of the adoption of the Single Act in 1986 as a key element of European economic development. This had been confirmed by the Commission's 1993 White Paper on growth, competitiveness and employment. The Brussels European Council of December 1993 had adopted a series of important decisions to speed up the implementation of the TENs, leading to the priority projects defined in Corfu and Essen in 1994. The Decision of July 1996 on Community Guidelines for the development of the TEN-T had enlarged the list of priority projects of Community interest. By 2003, total investment needs (including the Pan-European corridors) were estimated at more than 600 billion Euros.

On the other hand, assessments had revealed considerable delays in the implementation of the TEN-T, despite the fact that a number of ambitious projects had been realised. Another important issue was also that the 'ideological' change in the EU Transport Policy which occurred in 1992 in favour of a more environmentally-friendly transportation in Europe (introduction of the concept of 'sustainable mobility' in the White Paper of 1992) had not led to convincing results. Despite significant policy efforts (promotion of maritime, railway and waterway transport, introduction of road pricing etc.), road transport continued to increase at much higher speed than the other transport modes. Available forecasts had shown that this trend was long-lasting and that road transport flows would continue to increase at high rates, whatsoever conventional policy measures would be.

A tense debate took place at EU level and also within the member states involving those wishing to protect the environment and quality of life along the lines of the Göteborg Strategy of 2001 and of the Kyoto Agreement and those considering that present and future congestion of the transport networks would severely handicap the economic development. A determining argument was that the revival of the economy in the new member states of central and eastern Europe was precisely based on (or at least largely conditioned by) the accelerated development of road transportation, departing from the use of the dense, but obsolete railway transportation systems. In 2007, a EU Decision was finally taken to rapidly develop the European motorway network through ambitious investments. Member states would play a decisive role in the implementation of the strategy.

2.2.2.1.4 The motorway investments strategy

Main objectives of the motorway investments strategy adopted in 2007 was to reduce and prevent congestion on the European main networks (motorways and dual carriage ways). This included the elimination of bottlenecks, mainly in urban regions and in border areas, but also the connection of peripheral and/or landlocked regions to the European markets.

An additional objective was therefore to contribute to improving accessibility of the whole European territory through motorways.

The expansion of the European motorway network was accompanied by measures aiming at limiting the environmental impact of road traffic, in particular the introduction of stricter norms for engine emissions and significant R&D efforts in the development of new vehicle propulsion technologies, using less fuel as well as other types of fuels (hydrogen, electricity, biofuels). Other accompanying measures aimed at strengthening the development of Intelligent Transport Systems in a variety of fields, but mainly in order to improve the guidance of traffic with a view to reduce bottlenecks and to increase security.

The strategy considered that one of the main causes of traffic congestion was the superposition on the same networks (motorways, dual carriage ways) of long-distance and regional and local traffic. It therefore encouraged the lower-tier authorities (regions, municipalities) to promote public transportation and to improve secondary networks in order to divert as much as possible local and regional traffic from the motorways, in particular during the peak hours.

The key element of the strategy was the financing system. When the first estimates of the investment volume were realised (end of 2007), the figures obtained were much higher than those previously envisaged for the completion of the TEN-T (around 600 billion Euros). In addition to the projects of 'Community interest' which had a clear cross-border or transnational dimension, the strategy also included numerous motorway projects in highly urbanised and densely populated regions, because the reduction of congestion in these areas would be highly beneficial to long-distance transit transport of European significance. This is why the total investment volume estimated nearly reached 1500 billion Euros.

Needless to say that public resources alone would enable the implementation of only a tiny share of this investment volume. It was therefore necessary to develop a highly sophisticated system of financial engineering based on public-private partnerships. This made possible to maintain the principle of road pricing. Its objective was less to divert traffic from the motorways than to ensure the viability and profitability of investment projects. Tariffs for users were conceived as flexible and highly dependent upon the context. In the cohesion countries, EU subsidies (structural funds, cohesion fund) were used in public-private partnerships to reduce the level of tolls charges to users. This was considered as particularly important to ensure the viability of projects in countries with a low purchase power. In West-European countries, the level of EU subsidies was either very low or even non-existing, but the EU provided a public guarantee to loans in order to motivate banks, investment funds and other financing institutions to join the programme. The European Investment Bank also played an important part in the implementation of the strategy. Bonds were issued to mobilise a broader financial basis, both inside and outside the EU. A Regulatory Authority was set up, composed of representatives of the public sector (EU, states) and of the PPPs to monitor the implementation of the strategy, the economic viability and profitability of projects, the level of tolls and to provide advice and solutions to emerging problems.

The main idea was however to maintain road pricing at a moderate level in order not to divert traffic towards the secondary networks. There where EU subsidies were not available, national resources were injected into the PPPs, in order to limit the level of tolls. The system of financial engineering also comprised an instrument of financial equalisation between the PPPs, making possible for the Regulatory Authority to transfer a certain amount of revenue resources from the most profitable PPPs to those which were facing difficulties in terms of viability, while maintaining moderate levels of tolls.

2.2.2.1.5 Implementation of the strategy

The first steps of the strategy consisted in the concentration of EU support to motorway projects, at the expense of other transport infrastructure, in order to accelerate the realisation of projects which were already in the pipeline. The development of new motorway projects, from the planning phase to the end of realisation was however very time consuming. The first projects envisaged in 2007/2008 were not yet concretely implemented in 2015. Almost a decade was devoted to the planning and construction activities before the real benefits of the strategy became noticeable. In densely populated regions, specific difficulties arose at the stage of planning new motorways. Strong protests were expressed by the local population concerned by the potential environmental impacts of the projects. Negotiations took a long time and numerous specific (and expensive) solutions had to be elaborated (underground motorway sections, specific equipments against noise etc.).

During the period before 2015, a number of projects which had been launched in the early 2000s were completed, but this was not sufficient to absorb congestion. The saturation of various major corridors increased, generating a series of problems. Long-distance traffic used more and more the secondary networks and night traffic of trucks became generalised. The environmental impact on densely populated regions was high. People and enterprises stated relocating out of the most congested areas. They chose locations with still satisfactory accessibility, but outside the densest areas.

After 2020, the speed of projects realisation increased and new motorway sections were opened to traffic every year. Only the most ambitious projects (basis tunnels under the Alps, the Pyrenees, the Carpathian mountains) needed more time for their implementation. In maritime basins, (Baltic, Mediterranean, North Sea, Atlantic, Black Sea), the new motorways reached most medium-sized and large ports, so that numerous new ferry lines were developed.

2.2.2.1.6 Impacts

a) Impacts on the transportation systems

As indicated above, the real impacts of the strategy were noticeable only after 2015, while up to 2015, traffic flows had continued to regularly and substantially increase. Two phases can therefore be identified. Up to 2015, the transportation system in Europe worsened because of increasing congestion on a growing number of axes and corridors. After 2015, congestion progressively decreased, but to a lesser extent than expected, because the induction effect of new infrastructure on traffic generation went on increasing, in particular in the new member states. Traffic intensity (measured in tons x km or passenger x km) increased substantially because of higher trip generation and, in particular, growing trip lengths. European society became more traffic dependent: increasing individual mobility reflecting the preference for variety in leisure occupation, shorter working weeks and more frequent - although shorter - holidays with a larger transport content, multiple car ownership in households leading to greater freedom. In freight transport, the average volume or weight of consignments diminished, creating an increasing fragmentation of flows, including the growing incidence of direct home delivery from telephone and Internet purchasing. The progress of globalisation in the world production and trade system, reinforced by increasing integration and regional specialisation in the European Union's Single Market, provided additional elements in the growing transport intensity.

By 2030, the traffic situation on major axes and corridors had improved, compared with the situation in 2010 and 2015, although a number of bottlenecks remained. Much worse was the situation on secondary networks. These had hardly been improved, because financial resources were concentrated on the motorway network. The general increase in mobility and transport intensity created serious congestion and environmental problems in wide areas of the European territory, also quite far away from the motorways.

b) Macro-economic impacts

The macro-economic impacts of the strategy have been quite significant and they started rather quickly after the decision about the strategy was taken in 2007. The huge investment volumes carried out generated a large amount of construction works which in turn generated employment, turnover and tax revenue. Traffic demand being high, tolls revenue made possible the re-reimbursement of loans and the refunding of bonds without major difficulty.

Another dimension of the macro-economic impacts, which developed however only after 2015, was the reduction of congestion and the higher efficiency and productivity of transportation which acted economically as a reduction of transport costs in the whole production systems and therefore increased the GDP of the European Union and of individual countries. Along the same line, the improvement of accessibility of peripheral and landlocked regions contributed to integrate them better into the European single Market and to increase global European output. Positive macro-economic impacts were also noticeable in the sector of motor-car industries, including R&D and new technologies.

The positive aspects of macro-economic impacts were however somewhat outweighed by the increasing imports of oil in a context where the external energy dependency of Europe was seriously increasing.

c) Regional, environmental and territorial impacts

Considered from a Europe-wide perspective, the strategy favoured in the long range the development of more peripheral regions and therefore, polycentricity. Discrepancies in accessibility were seriously reduced, even if the density of motorway networks remained much higher in the Pentagon than in European peripheries. The strategy made also possible the development of motorway networks linking various maritime basins and avoiding the Pentagon. North-South axes were built between the Baltic States/Poland and the Adriatic and Black Sea basins. East-West axes were strengthened linking the Atlantic/North Sea ports to the new member countries of central and eastern Europe.

At meso-scale, the situation worsened up to 2015. The number of congested axes and corridors increased, mainly in the Pentagon, but also in and around urban regions in more peripheral areas. Transit countries like Germany, Denmark, France, Switzerland were particularly affected. In the productive sector, increasing congestion constrains intra-sectoral exchanges, access to final markets as well as the just-in-time approach. A number of changes in the productive and logistic structures become necessary. Productive activities progressively leave dense urban and metropolitan regions to relocate in intermediate regions in and around the pentagon, from where main markets as well as suppliers are still accessible through less congested main and secondary networks. As such strategies prove not to be sufficient, the splitting of production structures over large (sometimes Europe-wide) areas is progressively being given up by more and more companies. Main enterprises, subsidiaries and suppliers are being regrouped again in locations which are easily accessible from each other. This evolution benefits to the economy of areas with intermediate centrality, but is detrimental for peripheral regions. It is also detrimental to main ports which have not sufficiently developed railways and waterways as hinterland connections.

As far as the population of dense urban and metropolitan regions as well as corridor areas is concerned, it is more and more inclined to move away. Most favoured locations in less congested areas are however locations near public transport stations. More and more retired people leave urban and metropolitan areas to relocate in attractive rural areas.

After 2015, a number of improvements in the networks had considerable impacts, in particular in densely populated and congested regions. Thanks to the new motorways, the level of traffic congestion decreased in the English Midlands and the South-East, in the Benelux, in the Rhein-Ruhr and Rhein-Main regions, in the densely urbanised East-West corridors north and south of the Alps, in the corridor linking the Benelux to the Paris region, in the Rhone valley, in the corridors along the Mediterranean coast etc.

At local level, the crossings and access points of the modernised motorway network became preferred locations for new activities. Increasing rates of motorisation favoured however the progress of suburbanisation and dispersal of settlements. Congestion on secondary networks accentuated this trend, in particular in densely populated regions. Adjacent rural areas with less traffic density became attractive locations for both people and activities, provided reasonable access to the motorway network was ensured.

Impacts of the strategy on the environment have been far from positive. As far as the emission of greenhouse gas was concerned, the evolution went in a direction totally opposite to the Kyoto Agreement. Despite technological progress which significantly reduced the fuel consumption and gas emission of engines, the considerable increase of traffic flows, which had doubled and even tripled on numerous corridors by 2030, compared with the situation in 2005, resulted in strongly growing CO₂ and NO_x emissions. Emissions were not limited to areas bordering the motorway networks. Increasing traffic and congestion on secondary networks disseminated emissions widely throughout the European territory.

In addition to gas emissions, the strategy generated important damages to natural areas. Because of protests from the population as to the location of new motorways, these were mainly built in rural and natural areas, where population density is low. A number of new motorways were also built in mountain regions, affecting the natural heritage of numerous valleys. Coastal regions were also damaged, in particular in Mediterranean regions, where the mountainous character obliged to build the new motorways rather close to the coastline, generating pressure on settlements and on highly valuable landscapes.

2.2.2.1.7 Final images

The scenario provides two different images:

- an intermediate image around the year 2015 with increasing traffic congestion, in particular in densely populated regions, resulting in deteriorated living conditions. Concentration of population and activities in and around the Pentagon had progressed. Areas with intermediate accessibility, adjacent to urban regions or not too distant from them were becoming prosperous in terms of business location, but were facing increasing land-use conflicts and emerging environmental problems. This included also the hinterland of main and second-rank ports.
- a final image around 2030 with quite different characteristics. Growth and wealth have progressed towards the European peripheries along the most important corridors, as a result of increased accessibility through more developed motorway networks. The volume of investments carried out has had a significant impact on the revival of the European economy. Economic development is widespread along the grid of the motorway networks,

favouring the crossings and access points to motorways. Suburbanisation and dispersal of settlements have further developed. Secondary networks are quite saturated. The environmental impacts are strongly negative, both as far as emissions and damages to natural areas are concerned.

2.2.2.1.8 *Main issues resulting from the scenario*

the scenario shows which spatial evolutions would result if the projected increase of road traffic throughout the EU (demand projection) would be made possible through a substantial development of the motorway network throughout Europe. The scenario shows clearly that significant economic benefits would result from such a strategy, which would however be considerably outweighed by the intensity of resulting environmental problems. The scenario points out that benefits in terms of transport situation would not really emerge before 2015. In between, the increase of traffic congestion would however have wide territorial consequences: deterioration of the environment and quality of life, reduction of mobility, increase of transportation costs in production/distribution processes, changes in location patterns, both for enterprises and population and therefore impacts on inter-regional disparities. The scenario suggests the existence of traffic thresholds (and therefore of congestion thresholds) which are likely to generate 'chain reactions' in the behaviour of economic actors, in particular as far as location patterns are concerned. According to existing traffic projections, such thresholds could be reached on numerous corridors between 2010 and 2015, while the situation will improve afterwards when the implementation of the motorway strategy shows its first substantial results.

2.2.2.1.9 *Impacts for EU policies*

The scenario is based on the assumption that a considerable change takes place in the EU Transport Policy, backed by similar orientations in the transport policy of all member states. Based on alarming traffic forecasts, in particular as far as demand for road transport is concerned and considering the very insufficient results of the policy of 'sustainable mobility' carried out since the mid 1990s (promotion of environmentally-friendly transport modes), the EU decides in 2007 to implement an ambitious programme of motorway construction. Key instrument of this strategy is a sophisticated system of financial engineering based on public-private partnerships. The implementation of the strategy calls for coordination with EU regional and environment policies, in order to optimise the economic benefits (productivity of new infrastructure) and to minimise the environmental impacts (Natura 2000 Network in particular)

2.2.2.1.10 *Summary*

The scenario is based on the hypothesis that EU and national policies decide to make maximum use of the existing capacities of road transport infrastructure and to expand it, considering that modal split towards rail and maritime transport has not really been successful and that there is a clear trend in favour of road transportation in general, but in the new member states in particular. An ambitious motorway investments strategy is adopted in order to reduce and prevent congestion on the main European networks. Specific financial engineering based on public-private partnerships was developed. Considered from a Europe-wide perspective, the strategy favours in the long range the development of more peripheral regions and therefore polycentricity. At lower levels, a significant reduction of traffic congestion can be observed, in particular in highly urbanised regions, accompanied however by a significant progress of suburbanisation. The impacts of the strategy on the environment are far from positive, with a strong increase in greenhouse gas emissions and with significant damages to natural areas.

2.2.2.2 Scenario: 'Decoupling economic development from the mobility of people and goods'

2.2.2.2.1 Scenario hypotheses

The scenario is based on a combined strategy which aims on the one hand at enforcing the provisions of the Kyoto Agreement and of the Göteborg Strategy (reduction of greenhouse gas emissions and further environmental protection) and on the other hand at moving the European economy towards more knowledge-based components according to the Lisbon Strategy. A clear complementarity exists between these two dimensions: decoupling economic development from the mobility of people and goods works undoubtedly in favour of the environment, but cannot rely exclusively on transport policies. It has to integrate economic policy elements along the lines of the Lisbon Strategy. Policy measures are taken to limit road and short-distance air transport and to promote alternative transport modes.

2.2.2.2.2 Driving forces

In the field of transport policy, the main driving forces are the policy measures taken at all levels to discourage the use of cars and trucks, both for long-distance and for regional and local transportation of people and goods as well as those taken to reduce air transport on short distances. Specific policy measures encourage and promote alternative transport modes with lower environmental footprint.

In the field of economic policy, a series of measures are taken along the lines of the Lisbon Strategy in favour of a competitive knowledge-based economy likely to develop more immaterial economic functions and to have a positive impact on the reduction of freight flows.

In the field of trends, the main driving forces are the continuation of the globalisation and European integration processes generating significant increases in transport flows.

2.2.2.2.3 Contextual elements of the strategy

The strategy consists of the implementation of decisions taken long before the year 2005, but which had not been successful earlier. This is the case for the Kyoto Agreement, the Göteborg Strategy and the Lisbon Strategy. Surveys and assessments carried out for the period 2000-2005 indicated that the reduction of greenhouse gas emissions in Europe had not been sufficient, largely because of the strong increase of transport flows. The Kyoto Agreement having been ratified, its enforcement called for efficient measures aiming at the reduction of greenhouse gas emissions.

A similar situation prevailed in the case of the Lisbon Strategy. The mid-term assessment carried out in 2004 clearly showed that progress of the European economy in terms of growth rate was weak, compared with that of other large economies (USA, China) and that the move towards knowledge-based activities was too slow. It was considered that Europe urgently needed acceleration in the process towards a more immaterial economy in order to reduce the negative impacts of globalisation which materialise in increasing unemployment and enterprise relocation outside Europe.

This context led from 2005 onwards to a series of decisions related to significant changes in the EU transport and economic policy (including its industrial, technological and regional

dimensions), along the lines of Kyoto, Göteborg and Lisbon. The decisions were prepared during the 2005-2007 period and their implementation started in 2008.

The EU policy measures were backed by similar initiatives within the member states, at the various politico-administrative levels. Respecting the principle of subsidiarity, the vertical harmonisation of policy measures resulted mainly from conviction and consensus.

2.2.2.2.4 Elements of the strategy

At EU level, the main measures taken in the field of transport policy concerned the revision of the TEN-T. A new list of priority projects was established, focusing on the development of the HST network, on the rehabilitation and modernisation of conventional railways, in particular in the new member countries of central and eastern Europe, on the promotion of rail, waterway and maritime freight transport, as well as of intermodal transport. Projects concerning motorways or related to regional air transport were excluded, with the exception of those which were already under construction. In addition to the budget of the TEN-T, resources from the structural funds and from the cohesion fund were allocated to the implementation of the revised list of priority projects. In the case of particularly large projects likely to generate revenue, EU resources were also used to support public-private partnerships. The volume of EU resources allocated to technological development and R&D in the field of new transportation systems and less polluting engines was significantly increased.

Joint agreements were concluded between the EU level and the member states concerning matters of national competence, but necessitating for efficiency reasons, a good harmonisation at EU-wide scale. In this context, it was decided to apply high levels of road pricing, not only on motorways, but also on numerous roads of national and regional importance, where the introduction of road pricing was technically possible. In addition to this, it was decided to increase taxes on fuel, gasoline and kerosene, which came above the natural price increase of crude oil. Specific taxes were also introduced on short-distance air transport.

It was agreed that the additional revenue from road pricing and taxes would be allocated to the development of public transport networks and systems and to the promotion of transport modes with lower environmental footprint (support to investments; application of low tariffs).

Finally, the EU and the national authorities decided to jointly organise large-scale awareness-raising campaigns about the negative environmental impacts of road and air transport, targeting both European citizens and enterprises.

The lower-tier authorities (regions and municipalities) were invited to promote public transportation at regional and local levels through positive measures (development of public transport networks), benefiting from subsidies of the EU and national levels. They were also invited to discourage motor-car traffic in cities through the introduction of high tariffs for motor-car parking in city-centres, while the park-and-ride systems were promoted.

The link between the new transport policy and the economic policy along the lines of the Lisbon Strategy was ensured by a strong promotion of ICTs and related services. The objective was not only to give impetus to economic development, but also, with equal importance, to substitute e-services to physical mobility. Campaigns for the development of home-working were also carried out. In this respect, specific EU actions were to define a regulatory framework for electronic communications, to encourage the spread of ICTs, to

create conditions for efficient e-commerce and to support European leadership in mobile communication technologies.

The promotion of the knowledge-based economy implied also a number of other policy measures. These aimed first at boosting EU, national and private spending on R&D up to 5% of GDP. In this respect, one of the related objectives was also to make Europe more attractive for high-level researchers and to avoid that many young scientists continue to leave Europe on graduating, notably for the US. A system of mutual validation of national quality assurance and accreditation processes was developed, reducing the administrative obstacles to mobility of researchers in Europe. Measures were also taken to facilitate the entry of researchers and their dependants from outside the EU through simplified, fast-track work permit and visa procedures. The funding of research institutions and universities was reconsidered and substantially improved. Measures were taken to promote and strengthen the creative interaction between universities, scientists and researchers on the one hand and industry and commerce on the other, in order to drive technology transfer and innovation. The strategy included also measures related to education and qualification, aiming at adapting education and training systems for the knowledge society and at fostering lifelong learning.

2.2.2.2.5 Implementation of the strategy

The implementation of the measures decided in 2007/2008 was not immediate. Some measures could be implemented in the short-term, others needed a quite long period before they became effective. In fact, it was a process that developed and intensified during the period considered.

In the field of transport policy, the first measures to be implemented concerned the progressive increase of prices and tariffs: road pricing, taxes on gasoline, fuel and kerosene, tariffs for car parking in cities. Such measures, which were by far not popular and created numerous tensions, had a quite rapid impact on the behaviour of people and economic actors and influenced directly the transportation market. Their progressive intensification convinced the transport users that the new policy was long-lasting and that it was worth envisaging long-term solutions, notably in terms of locations, activities etc.

Among the changes which could be rapidly observed, there was in first place a more intensive use of public transportation, both at local/regional level and also for long-distance trips. The income of public transportation companies increased and they could invest more in expanding the networks and improving the quality of services. A second important change was the intensification of e-commerce, e-services and home-working. This contributed to significantly reduce mobility at local/regional level.

Modal changes were less rapid in freight transport. Although all manufacturing industries and trade companies had noticed a significant increase in transport costs for their products, modal changes, departing from road transportation, implied the availability of equivalent services in other transport modes or in the field of intermodal transport. Such services were not immediately available. Structural evolutions had to take place in the organisation of railway and maritime companies. Important investments were necessary in infrastructure development and modernisation as well as in rolling stock. A favourable factor was that the increase in costs of the road transport mode made the other transport modes more competitive and therefore profitable. After 2015, freight transport in Europe had taken a different shape. The share of road transport had started to decline, in particular for long-distance haulage.

Structural changes in the European economy were driven by both the progress of globalisation and the new economic policy. The importance of traditional activities, using heavy raw materials, declined significantly. This affected mainly the new member countries of central and eastern Europe, but also a number of regions with traditional manufacturing industries in western Europe. The European economy specialised more and more in products with high added value and technological content as well as in immaterial production. The requirements in terms of transportation were significantly modified. Speed, flexibility, reliability became very important factors. Capillarity in the final access to customers was also an increasing requirement. New transport services had to be created, in which logistics, combined and intermodal transport had a growing importance. High speed freight trains were operated, as well as high speed maritime transport.

2.2.2.2.6 Impacts

a) Impacts in the transport sector

Up to 2015, the nature of transport flows did not change significantly. The impact was mainly concentrated on the volume of flows and on transport modes used. The increase of transport costs, which was soon observable after the new policy was adopted, had a rather quick impact on the volume of road passenger transport, which decreased. In general terms, the mobility of people also decreased. The period up to 2015 was more problematic for freight transport, because the transport volumes continued to increase in a context which was constraining in the field of road transport (higher costs, strong decrease of infrastructure investments). Traffic congestion on the road and motorway networks continued to increase during that period, although this was attenuated by the fact that more and more people used public transport and much less their motor-car for daily commuting and also for long-distance trips. This increased somewhat the capacity of roads and motorways for freight transport. Another factor which worked in the same direction up to 2015, was the lower level of economic development which resulted from the new transport policy in relation to freight transport costs.

After 2015, the transport situation became more sustainable. This resulted from a combination of various factors. The new policies in transport and economy had generated structural changes. The move towards a more immaterial economy has contributed to moderate the volume of freight transport flows. In addition, the nature of flows also had changed, with more products having lower weight and higher added value. A number of significant investments in transport systems had been carried out (infrastructure, rolling stock, intermodal facilities etc.). The HST network had strongly expanded, at least on connections enabling profitable services. In the UK, the Midlands as well as the cities of Edinburgh and Glasgow were connected. In the Iberian Peninsula, the HST network connected Barcelona, Madrid, Seville, Lisbon and Porto to the rest of Europe through two connections on both sides of the Pyrenees. In the Nordic countries, the HST triangle Copenhagen, Oslo, Stockholm was completed and connected to the rest of Europe through the 'Vogelfluglinie' bridge. The HST connection from Munich to Vienna, Bratislava and Budapest was in operation, as did the HST line from Berlin to Warsaw. Zagreb and Ljubljana were connected to Milan through Trieste and Venice. A number of HST connections had replaced former short-distance air connections. The public transport networks of metropolitan areas and medium-sized towns had been modernised and enlarged. The motorways of the sea had finally become a reality, thanks to new technologies in the maritime sector.

In the new member states with more traditional manufacturing industries, specific problems arose because transport needs increased while the railway networks were obsolete and the motorway networks were weakly developed. Priority was given to the rapid modernisation

of railways and this factor played an important part in the development of long-distance rail freight transport and intermodal transport at Europe-wide scale, especially on East-West corridors.

At the end of the period considered (around 2030), the spiral of exponentially growing traffic flows had lost of its energy and the situation had stabilised in quantitative terms, while significant qualitative changes had taken place in the transport systems themselves.

b) Macro-economic impacts

Various elements of the new policies had macro-economic impacts, sometimes in opposite directions. The increase of transport costs had negative macro-economic impacts for a number of years until the necessary structural adaptations in terms of production, locations, alternative transport systems etc. were made. This created difficulties for numerous enterprises for which transport costs represent a significant share of turnover and brought additional constraints to the existing challenges of progressing globalisation.

These negative macro-economic impacts were however progressively outweighed on the one hand by the important investment volumes made in alternative transport systems, which generated employment, tax revenue and progress in transport technologies and, on the other hand, by the emerging knowledge-based economy which generated numerous innovations and patents as well as significant amounts of added value in economic outputs.

At the end of the period considered, economic development was progressing at a satisfactory rate and the growth differential with the USA had become smaller, while the transport situation was under control. The decoupling strategy between economic development and the growth of transport flows, in particular on roads and motorways, had been rather successful.

c) Regional, environmental and territorial impacts

At Europe-wide scale, the regions which were most advantaged (or less disfavoured) in economic terms by the new transport and economic policies, were those easily accessible by long-distance railways, HST, waterways and maritime transport. These are mainly regions with large metropolitan areas within the Pentagon, but also outside of it. In the European periphery, regions and cities with large ports were comparatively less disfavoured.

The regions most disfavoured were those the large-scale accessibility of which was largely dependent upon road and air transport. Numerous peripheral regions belonged to this category (Ireland, Scotland, parts of the Iberian Peninsula, southern Italy, Greece, northern periphery, eastern parts of the new member countries), but also a number of more centrally located large rural areas (such as the French Massif Central, the French and Belgian Ardennes), quite distant from main axes and corridors. In the new member countries, the new transport policy was a particular economic handicap in the short and medium-range. Economic development could not progress as strongly as expected, also because the penetration of the knowledge-based economy was less rapid than in Western Europe. The modernisation of the railway network and the development of intermodal and maritime transport progressively favoured the accessibility of large and medium-sized towns as well as the development of port regions.

All this resulted in an increase of disparities related to large-scale accessibility at European level and worked generally against polycentricity.

At meso-level, regions with dense railway networks or important commercial ports have been favoured. Intermodal platforms developed there, connected to the railway, waterway

networks and ports. Networks of towns and cities emerged under the effect of improved inter-urban public transportation. In the productive sector, the spatial de-concentration of manufacturing and service activities (back office functions) out of metropolitan areas slowed down. Activities concentrated in locations with good accessibility by railway, but also around large ports, along waterways etc. Important innovation-oriented clusters developed in numerous European regions, but mainly in the Pentagon. Migration of population towards rural areas (retired people in particular) did not significantly slow down (although dependence upon road transportation is higher in rural areas), because the price of dwellings in cities strongly increased (push effect). The major pattern of territorial evolution at meso-scale has been one of nodal densification along corridors.

At more local level, and in particular in urban areas, motor-car related suburbanisation slowed down. In the periphery of large cities and metropolitan areas, a concentration of residential and productive functions took place around the stations of public transportation networks. These networks were significantly expanded. The concentration of settlements generated strong increase in land value. Demand for housing in urban areas increased significantly and prices also, because commuting by car became very expensive. Urban derelict land was rehabilitated. There was also a strong demand for nature and recreation areas at immediate proximity of cities.

In remote or peripheral rural regions, small and medium-sized towns were much less prosperous. Being largely dependent upon road transportation, their attractiveness decreased. A number of them were negatively affected by the relocation of activities induced by the need to reduce transportation costs.

The new transport and economic policies were highly beneficial to the environment and quality of life, in particular in the long range. The level of greenhouse gas emissions was significantly reduced and natural areas were better protected against further developments of the road and motorway networks as well as against suburbanisation and dispersal of settlements. There was however stronger pressure from recreation and leisure activities on natural areas located in the vicinity of cities. Because of less widespread use of motor-cars in tourist activities, these tended to become more spatially concentrated. This was somewhat detrimental to the development of soft tourism and to rural areas which were used to draw additional income from their natural and cultural heritage.

2.2.2.2.7 Final image

In the long range (around 2030), the final image of the European territory shows networks of compact cities well interconnected through high-capacity and high-speed railways. These cities are surrounded by nature and recreation areas. Long-distance commuting by car to large cities has become the exception. Suburbanisation trends also have been strongly reduced.

Rural areas are generally less populated than they were in 2005, with the exception of those which are particularly attractive for retired people. Settlements in rural areas are however less dispersed, to take advantage of public transportation services.

Considered at a wider scale, disparities among European regions are stronger than in 2005. Growth has favoured the cities of the pentagon as well as a number of other large cities outside of it, in particular those with large ports or good railway connections at reasonable distance from main markets. Numerous regions of the European periphery have a weak development rate and even decline.

2.2.2.2.8 *Main issues resulting from the scenario and impacts on EU and other policies*

The scenario is a policy scenario aiming at discouraging the development of road and short-distance air transportation through strong policies including a wide range of measures. It does not rely only upon transport policy, but also upon efficient instruments to implement the Lisbon Strategy, because transport policies alone will never achieve the decoupling between economic development and the growth of transport flows. The scenario shows that success in this field can be achieved up to a certain extent and in the long range if coherent and substantial policies are applied at all levels. As numerous items among the measures envisaged are not really popular (at least for some segments of the European population) the question can be raised in how far such a scenario is politically realistic. The scenario shows also that the impacts of such policies go far beyond the reduction of air pollution and greenhouse gas and the limitation of climate change. Impacts can also be observed on the relative accessibility of the respective European regions and therefore on the evolution of inter-regional disparities in Europe. In order to avoid negative evolutions in this field, transport and economic policies should be accompanied by other public policy measures, in particular in the field of regional policy (in order to counteract territorial imbalances), urban planning (in order to counteract land price speculation, to promote better integration of urban functions and to limit short-distance mobility etc.), governance (stronger cooperation between local authorities, administrative levels and sectoral administrations).

2.2.2.2.9 *Summary*

The scenario is based on a combined strategy which aims on the one hand at enforcing the provisions of the Kyoto Agreement and of the Göteborg Strategy (reduction of greenhouse gas emissions and further environmental protection) and on the other hand at moving the European economy towards more knowledge-based components according to the Lisbon Strategy. Policy measures are taken at all levels to discourage the use of cars and trucks, both for long-distance and for regional and local transportation of people and goods and to reduce air transport on short distances. Specific policy measures encourage and promote alternative transport modes with lower environmental footprint. The transport strategy is accompanied by measures of economic policy likely to favour the knowledge-based economy and to develop more immaterial economic functions. The implementation of the strategy shows negative macro-economic impacts in the short-term (increase of transport costs), but high competitiveness in the long-term. At Europe-wide scale, the regions most advantaged are those easily accessible by long-distance efficient railways, H.S.T., waterways and maritime transport. These are mainly regions with large metropolitan areas within the Pentagon, but also outside of it. The regions most disfavoured are those the national and European accessibility of which is largely dependent upon road and air transport, numerous peripheral regions belonging to this category. At meso-level, regions with dense railway networks or important commercial ports are favoured. At more local level, the evolution is in favour of compact cities, suburbanisation trends slowing down. The new transport and economic policies are highly beneficial to the environment and quality of life, in particular in the long range.

2.2.2.2.10 Possible ESPON Indicators for the transport scenarios

Numerous ESPON core-indicators can be used in the context of these scenarios, such as:

- Income per capita, GDP per capita
- Population growth
- Net migration rate
- Unemployment rate
- Passengers in airports
- Transport network by mode
- Transport node by mode
- Travel time by spatial level and transport mode
- Daytime accessibility by transport mode
- Network distance to linear distance ratio
- Proportion of main lines connected to digital exchange
- ADSL lines as a proportion of total main lines
- Proportion of exchanges with co-located equipment
- Availability of Internet services with local rate charges/unmetered access
- ADSL subscribers per 10 000 inh.
- Proportion of households with broadband Internet access
- ICT tele-communication
- Tourist capacity
- Market accessibility potential by spatial level and transport mode
- Travel time by spatial level and transport mode
- Travel costs by transport mode
- Average speed to markets
- Average time to markets
- Impact of accessibility change on GDP per capita
- Impact of accessibility change on Equivalent income measure of user benefits
- Impact of accessibility change on employment.

Appendix : transport scenario base

Forecasts, projections, scenarios

White paper 2010' scenarios

| EU-15 | 1998 | | | 2010 Anticipated trend | | | 2010 — Option A | | | 2010 — Option B | | | 2010 — Option C | | |
|-------------------------|------------|----------|----------------------------|------------------------|----------|----------------------------|-----------------|----------|----------------------------|-----------------|----------|----------------------------|-----------------|----------|----------------------------|
| | Bn Pkm-Tkm | Bn Vehkm | Mio Tonnes CO ₂ | Bn Pkm-Tkm | Bn Vehkm | Mio Tonnes CO ₂ | Bn Pkm-Tkm | Bn Vehkm | Mio Tonnes CO ₂ | Bn Pkm-Tkm | Bn Vehkm | Mio Tonnes CO ₂ | Bn Pkm-Tkm | Bn Vehkm | Mio Tonnes CO ₂ |
| Cars | 3 776 | 2 221.2 | 434.2 | 4 650 | 2 735.3 | 453.4 | 4 650 | 2 486.6 | 412.2 | 4 650 | 2 486.6 | 412.2 | 4 559 | 2 438 | 404.1 |
| Bus-coach | 415 | 24.4 | 18.7 | 441 | 25.9 | 19.8 | 441 | 25.9 | 19.8 | 441 | 23.6 | 18.0 | 501 | 26.8 | 20.5 |
| Metro-tram | 50 | 0.5 | 0 | 53 | 0.5 | 0.0 | 53 | 0.5 | 0.0 | 53 | 0.5 | 0.0 | 61 | 0.5 | 0.0 |
| Railway | 290 | 1.5 | 6.4 | 327 | 1.7 | 7.2 | 327 | 1.7 | 7.2 | 327 | 1.5 | 6.5 | 400 | 1.8 | 8.0 |
| Air transport | 241 | 1.9 | 59.3 | 458 | 3.7 | 112.7 | 458 | 3.7 | 112.7 | 458 | 3.3 | 102.4 | 408 | 3.0 | 91.2 |
| Total passengers | 4 772 | 2 249.5 | 518.6 | 5 929 | 2 767.1 | 593.1 | 5 929 | 2 518.4 | 551.9 | 5 929 | 2 515.5 | 539.1 | 5 929 | 2 470.1 | 523.8 |
| Growth 1998-2010 | | | | 24 % | 23 % | 14 % | 24 % | 12 % | 6 % | 24 % | 12 % | 4 % | 24 % | 10 % | 1 % |
| Road | 1 255 | 313.8 | 271.1 | 1 882 | 470.5 | 406.5 | 1 882 | 427.7 | 369.6 | 1 882 | 427.7 | 369.6 | 1 736 | 394.5 | 340.9 |
| Railway | 241 | 1.3 | 1.9 | 272 | 1.5 | 2.2 | 272 | 1.5 | 2.2 | 272 | 1.4 | 2.0 | 333 | 1.7 | 2.4 |
| Inland waterways | 121 | 0.3 | 3.6 | 138 | 0.4 | 4.1 | 138 | 0.4 | 4.1 | 138 | 0.4 | 3.8 | 167 | 0.4 | 4.6 |
| Pipelines | 87 | | 1.0 | 100 | | 1.0 | 100 | | 1.0 | 100 | | 1.0 | 100 | | 1.0 |
| Short sea shipping | 1 166 | 0.3 | 23.3 | 1 579 | 0.4 | 31.6 | 1 579 | 0.4 | 31.6 | 1 579 | 0.4 | 28.7 | 1 635 | 0.4 | 29.7 |
| Total goods | 2 870 | 315.76 | 300.9 | 3 971 | 472.8 | 445.4 | 3 971 | 430 | 408.5 | 3 971 | 429.8 | 405.1 | 3 971 | 397.0 | 378.6 |
| Growth over 1998 | | | | 38 % | 50 % | 48 % | 38 % | 36 % | 36 % | 38 % | 36 % | 35 % | 38 % | 26 % | 26 % |
| Total | | 2 565.2 | 819.5 | | 3 239.9 | 1 038.5 | | 2 948.4 | 960.4 | | 2 945.3 | 944.2 | | 2 867.1 | 902.4 |
| Growth 1998-2010 | | | | | 26 % | 27 % | | 15 % | 17 % | | 15 % | 15 % | | 12 % | 10 % |
| Growth in GDP 1998-2010 | | | | | 43 % | 43 % | | 43 % | 43 % | | 43 % | 43 % | | 43 % | 43 % |

Source: For the 1998 data on passenger-km and tonne-km, *EU transport in figures, statistical pocketbook*, European Commission 2000. The data on CO₂ emissions and vehicle-km are estimates produced by the Commission's departments.

TEN-STAC scenarios

Table 1.1 Percentage growth in traffic performance EU-27, 2000-2020 (pass km/ton km)

| | TREND+ | EUROPEAN | EUROPEAN+ |
|------------------------|--------|----------|-----------|
| Total growth passenger | 31% | 32% | 34% |
| Growth passenger int'l | 53% | 54% | 55% |
| Total growth freight | 75% | 75% | 79% |
| Growth freight int'l | 91% | 91% | 98% |

Table 1.2 Changes in costs for travel times interregional freight and passenger transport, potential travel savings (EU15+2 and CEEC12)⁶

| | Differences TREND+ 2020 versus base year 2000 (* mio €) | Differences EUROPEAN 2020 versus base year 2000 (* mio €) | Differences EUROPEAN+ 2020 versus base year 2000 (* mio €) |
|----------------------|---|--|---|
| Road freight | -2,100 | -3,548 | -4,471 |
| Rail freight | -218 | -453 | -757 |
| Passenger, all modes | -3,247 | -5,925 | -8,097. |

Table 1.3 Change in emissions road transport (passenger and freight) 2020 vs base year 2000 (EU15+2 and CEEC12)

| | TREND+ | EUROPEAN | EUROPEAN+ |
|-----------------|--------|----------|-----------|
| CO ₂ | 38% | 16% | 16% |
| NO _x | -39% | -52% | -52% |
| Particulates | -48% | -49% | -49% |

Table 3.8 Traffic performance TREND+, EUROPEAN and EUROPEAN+ scenarios 2020, EU15 (in billion passenger km & ton km)

| EU15 | Base year 2000 | | | TREND+ 2020 | | | EUROPEAN 2020 | | | EUROPEAN+ 2020 | | |
|---------------------------------------|----------------|-------|-------|-------------|-------|-------|---------------|-------|-------|----------------|-------|-------|
| | Total | % m-s | Int'l | Total | % m-s | Int'l | Total | % m-s | Int'l | Total | % m-s | Int'l |
| Passenger transport | | | | | | | | | | | | |
| Car & coach | 4,351 | 87% | 290 | 5,394 | 85% | 363 | 5,392 | 85% | 362 | 5,507 | 85% | 361 |
| Railway | 356 | 7% | 28 | 426 | 7% | 38 | 437 | 7% | 44 | 445 | 7% | 47 |
| Air | 281 | 6% | 226 | 528 | 8% | 424 | 526 | 8% | 422 | 523 | 8% | 421 |
| Total passengers | 4,988 | 100% | 544 | 6,348 | 100% | 825 | 6,355 | 100% | 828 | 6,475 | 100% | 829 |
| Growth 2000 – 2020 | | | | | 27% | | | 27% | | | 30% | |
| Freight transport¹⁵ | | | | | | | | | | | | |
| Road | 987 | 74% | 367 | 1,647 | 72% | 667 | 1,607 | 70% | 656 | 1,570 | 69% | 642 |
| Railway | 210 | 16% | 81 | 392 | 17% | 146 | 438 | 19% | 162 | 471 | 21% | 168 |
| Inland waterways | 145 | 11% | 105 | 242 | 11% | 170 | 243 | 11% | 170 | 246 | 11% | 173 |
| Total goods | 1,342 | 100% | 553 | 2,281 | 100% | 983 | 2,288 | 100% | 988 | 2,287 | 100% | 983 |
| Growth goods 2000 – 2020 | | | | | 70% | | | 70% | | | 70% | |
| Growth in GDP 2000 – 2020 | | | | | 60% | | | 60% | | | 60% | |
| | | | | | | | | | | | | 60% |

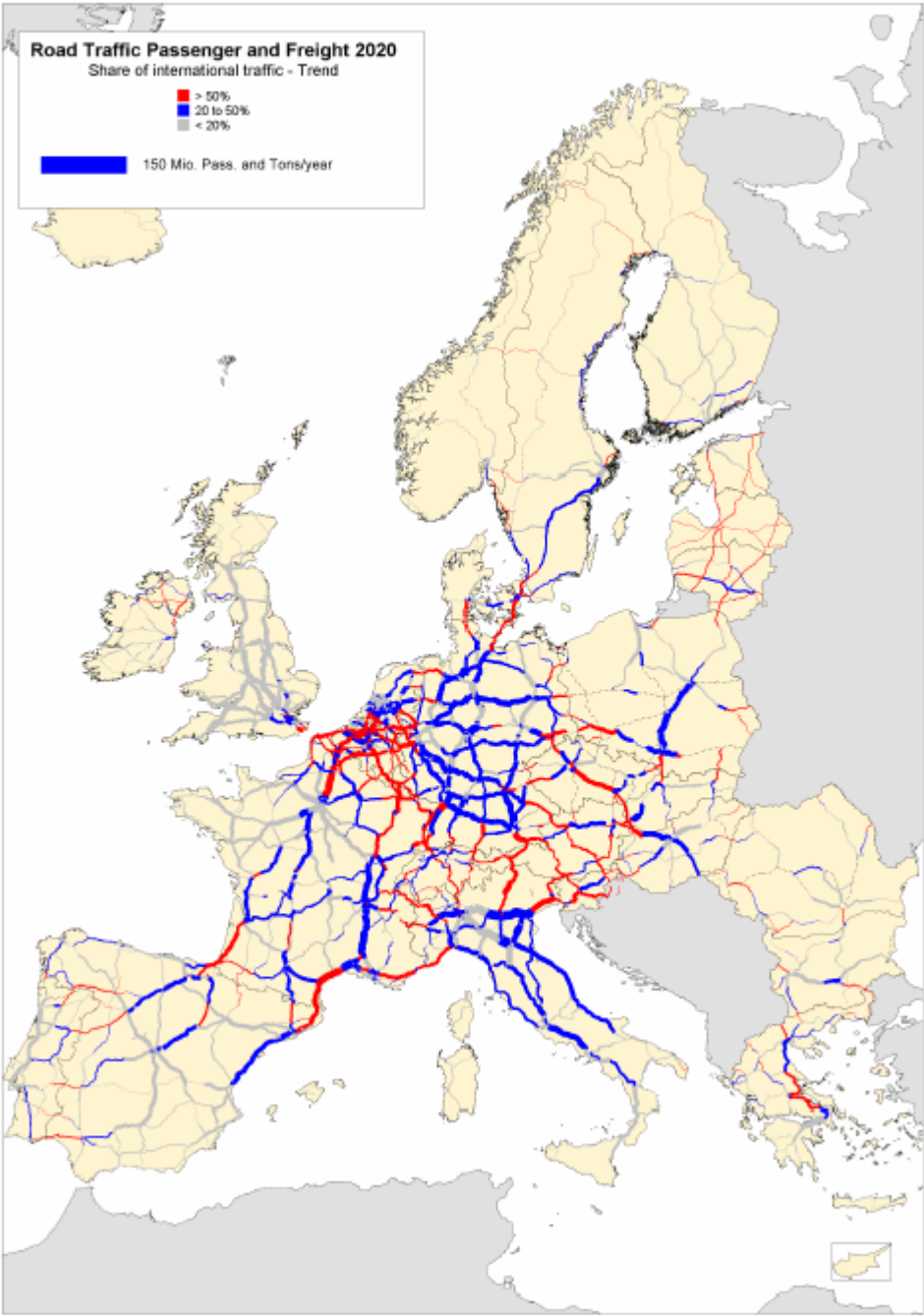
Table 3.9 Traffic performance TREND+, EUROPEAN and EUROPEAN+ scenarios 2020, EU27 (in billion passenger km & ton km)

| EU15+ CEE12 | Base year 2000 | | | | TREND+ 2020 | | | | EUROPEAN 2020 | | | | EUROPEAN+ 2020 | | | |
|----------------------------|----------------|-------|-------|-------|-------------|-------|-------|-------|---------------|-------|-------|-------|----------------|-------|-------|-------|
| | Total | % m-s | Int'l | % m-s | Total | % m-s | Int'l | % m-s | Total | % m-s | Int'l | % m-s | Total | % m-s | Int'l | % m-s |
| Passenger transport | | | | | | | | | | | | | | | | |
| Car & coach | 4,864 | 87% | 339 | 55% | 6,253 | 85% | 435 | 46% | 6,258 | 85% | 436 | 46% | 6,410 | 85% | 437 | 46% |
| Railway | 417 | 7% | 35 | 6% | 501 | 7% | 48 | 5% | 512 | 7% | 54 | 6% | 530 | 7% | 62 | 6% |
| Air | 299 | 5% | 243 | 39% | 570 | 8% | 463 | 49% | 568 | 8% | 461 | 48% | 564 | 8% | 459 | 48% |
| Total passengers | 5,580 | 100% | 617 | 100% | 7,324 | 100% | 946 | 100% | 7,338 | 100% | 951 | 100% | 7,504 | 100% | 958 | 100% |
| Growth 2000 - 2020 | | | | | | 31% | | 53% | | 32% | | 54% | | 34% | | 55% |
| Freight transport | | | | | | | | | | | | | | | | |
| Road | 1,145 | 68% | 412 | 58% | 2,021 | 69% | 820 | 60% | 1,985 | 68% | 809 | 59% | 1,959 | 66% | 808 | 58% |
| Railway | 376 | 22% | 187 | 26% | 647 | 22% | 351 | 26% | 691 | 24% | 366 | 27% | 767 | 26% | 412 | 30% |
| Inland waterways | 152 | 9% | 112 | 16% | 260 | 9% | 187 | 14% | 260 | 9% | 186 | 14% | 263 | 9% | 188 | 13% |
| Total goods | 1,673 | 100% | 711 | 100% | 2,928 | 100% | 1,358 | 100% | 2,936 | 100% | 1,361 | 100% | 2,989 | 100% | 1,408 | 100% |
| Growth goods 2000 - 2020 | | | | | | 75% | | 91% | | 75% | | 91% | | 79% | | 98% |
| Growth in GDP 2000 - 2020 | | | | | | 62% | | 62% | | 62% | | 62% | | 62% | | 62% |

Table 3.10 Traffic performance TREND+, EUROPEAN and EUROPEAN+ scenarios 2020, CEEC12 (in billion passenger km & ton km)

| CEEC12 | Base year 2000 | | | | TREND+ 2020 | | | | EUROPEAN 2020 | | | | EUROPEAN+ 2020 | | | |
|----------------------------|----------------|-------|-------|-------|-------------|-------|-------|-------|---------------|-------|-------|-------|----------------|-------|-------|-------|
| | Total | % m-s | Int'l | % m-s | Total | % m-s | Int'l | % m-s | Total | % m-s | Int'l | % m-s | Total | % m-s | Int'l | % m-s |
| Passenger transport | | | | | | | | | | | | | | | | |
| Car & coach | 513 | 87% | 49 | 67% | 859 | 88% | 72 | 60% | 866 | 88% | 74 | 60% | 903 | 88% | 76 | 59% |
| Railway | 61 | 10% | 7 | 10% | 75 | 8% | 10 | 8% | 75 | 8% | 10 | 8% | 85 | 8% | 15 | 12% |
| Air | 18 | 3% | 17 | 23% | 42 | 4% | 39 | 32% | 42 | 4% | 39 | 32% | 41 | 4% | 38 | 29% |
| Total passengers | 592 | 100% | 73 | 100% | 975 | 100% | 121 | 100% | 983 | 100% | 123 | 100% | 1029 | 100% | 129 | 100% |
| Growth 2000 – 2020 | | | | | | 65% | | 66% | | 66% | | 68% | | 74% | | 77% |
| Freight transport | | | | | | | | | | | | | | | | |
| Road | 158 | 48% | 45 | 28% | 374 | 58% | 153 | 41% | 378 | 58% | 153 | 41% | 389 | 55% | 166 | 39% |
| Railway | 166 | 50% | 106 | 67% | 255 | 39% | 205 | 55% | 253 | 39% | 204 | 55% | 296 | 42% | 244 | 57% |
| Inland waterways | 7 | 2% | 7 | 4% | 18 | 3% | 17 | 5% | 17 | 3% | 16 | 4% | 17 | 2% | 15 | 4% |
| Total goods | 331 | 100% | 158 | 100% | 647 | 100% | 375 | 100% | 648 | 100% | 373 | 100% | 702 | 100% | 425 | 100% |
| Growth goods 2000 – 2020 | | | | | | 95% | | 137% | | 96% | | 136% | | 112% | | 169% |
| Growth in GDP 2000 – 2020 | | | | | | 108% | | 108% | | 108% | | 108% | | 108% | | 108% |

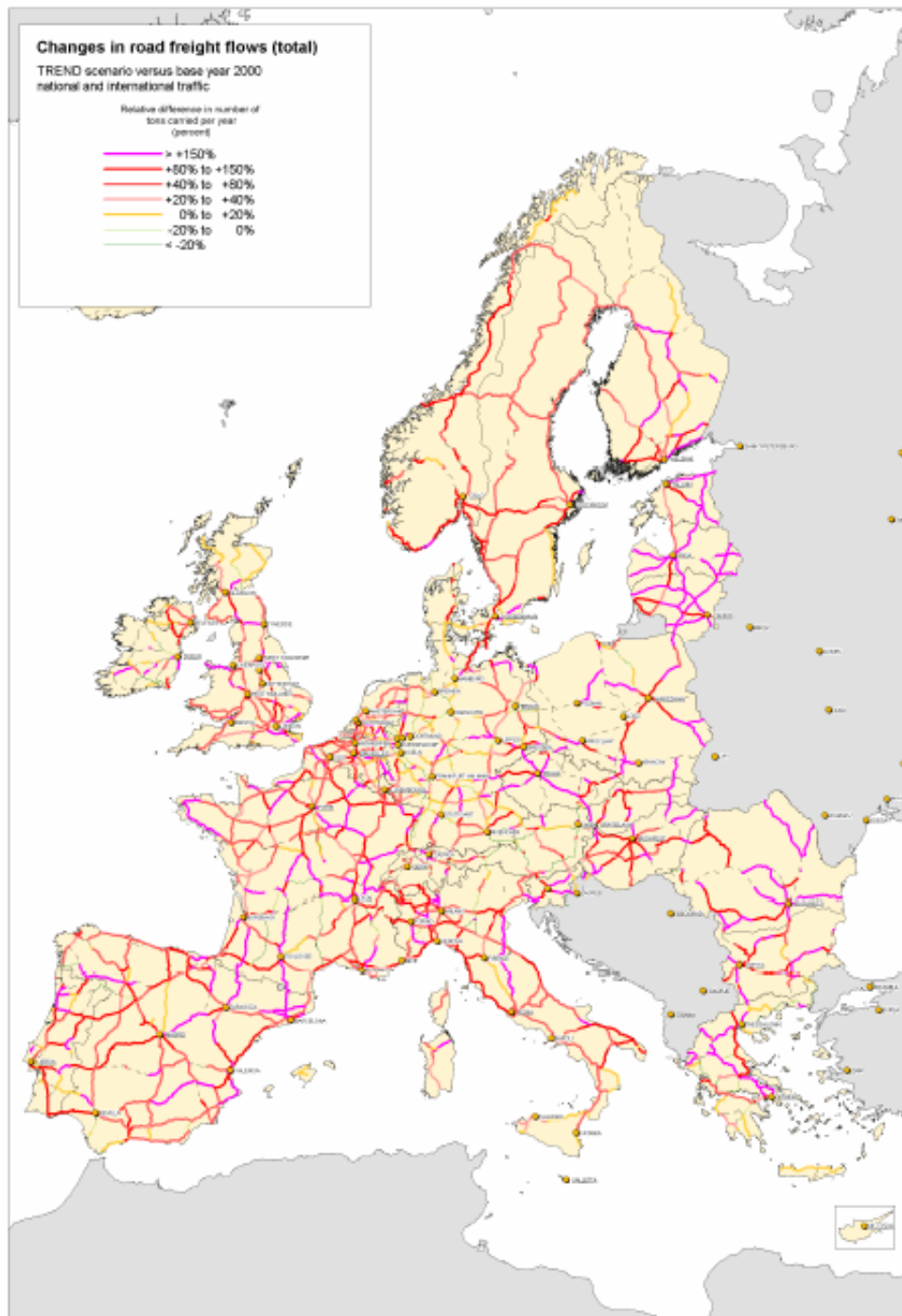
TEN-STAC Study: Share of international traffic in road traffic passenger and freight 2020 (Trend scenario)



TEN-STAC Study: Relative changes in road passenger flows 2000-2020 (Trend+ scenario)



TEN-STAC Study: Relative change in road freight flows 2000-2020 (Trend+ scenario)



2.3 Energy

2.3.1 Scenario base

2.3.1.1 Sources of information

The scenario base is a compilation of information originating mainly from:

- Green Paper. Towards a European strategy for the security of energy supply. Main document and Technical document. European Commission. 2001.
- World energy, technology and climate policy outlook. WETO 2030 study. European Commission. 2003.
- ESPON Study 2.1.4.: 'Territorial trends of energy services and networks and territorial impact of EU energy policy'. CEEETA. SIR. 2003.
- Study on energy supply security and geopolitics. CIEP. European Commission. 2004.

Energy scenario base

For the European Union, energy has an internal dimension and an external dimension. Internally, Europe needs to balance supply and demand, while respecting environmental, consumer, safety, political and economic demand. Externally, adequate and suitable supplies must be available to fill the gap between domestic production and domestic needs. The objective of independence from external energy suppliers has been replaced by the objective of managing external dependence.

2.3.1.2 Primary energy sources: world and Europe

2.3.1.2.1 *Non-renewable energy sources*

a) Reserves

Oil

The world's reported proven reserves continue to be dominated by the Middle East, which holds 64% of total global reserves. Other important oil reserves are located in the former Soviet Union and in the Americas. The Middle East is therefore likely to remain Europe's most interesting source of oil for the foreseeable future.

The rate at which reserves are being exploited is high in all regions apart from the Middle East. Non-OPEC conventional supply is around its peak. Moreover, it is likely that other regions of the world might increase their demand for Middle East oil. Such a situation not only reduces the availability of resources for the EU, but also pushes the price up.

The uncertainty factors include levels of investment in technology and infrastructure, physical availability and geopolitics. What is fairly certain is that rates of production will decline before reserves are fully exploited. Another factor which might affect exploitation of reserves is Climate Change.

Natural gas

Gas reserves are, compared with oil, relatively well distributed around the globe. The former Soviet Union is the major source of gas reserves, with the Middle East a close second. Other major reserves are spread in Asia Pacific, the Americas, Africa and Europe. Estimates of world gas reserves, like oil, continue to rise, by around 1% p.a.

As far as the EU is concerned, 80% of world reserves are within a recoverable distance from the EU. The fields of most interest to the EU are in the North Sea, North Africa, in the former Soviet Union and Middle East. These are logistically easier to exploit and provide adequate security. However, competing pressure for supplies will increase as demand grows in Eastern Asia in particular.

Worldwide, the prospects for gas supply are relatively good in the short term, with a ratio of reserves to production of over 60 years and the depletion decline point coming in perhaps 20 years or so. The former Soviet Union has particularly good prospects of 80 years, while in Europe the figure is almost 20 years (based on current production levels).

Solid fuels

Almost 80% of world coal reserves are now concentrated in North America, Asia Pacific and the former Soviet Union. Reserves in Europe, based on calorific value, are estimated at 72 billion tons of coal units (of which 70% is hard coal). Overall, coal represents 80% of fossil fuel reserves in the EU-15 (96% in Eastern Europe). More limited reserves can be found in South America and Africa. Coal reserves are being used at a far slowest rate than oil and gas, particularly within the EU and applicant countries.

Nuclear

Globally, conventional uranium reserves cover between 60-260 years, depending on cost and probability of occurrence, using present reactor technology. With breeders, the same reserves are sufficient to produce electricity well over 3000 years at today's level. In addition substantial unconventional uranium resources exist in phosphates (360 years) and sea water (66000 years).

For certain reactor types, thorium could be used as source for nuclear fuel. Uranium reserves are well distributed around the world including Australia, Canada, USA, as well as Kazakhstan, Uzbekistan, Africa, Brazil and Russia. Within the EU natural reserves are small, but supplies for the rest of the nuclear fuel cycle are not threatened.

There are considerable secondary sources of uranium – civil inventories of natural or enriched uranium, resulting from the blending down of highly enriched uranium no longer needed for defence purposes, irradiated uranium separated by reprocessing or contained in spent fuel and depleted uranium that can be further used. However, the availability of these sources is variable, depending on its form.

b) Production

Oil

Global crude oil production has continued to rise since an uneven spell in the 1970's and early 1980's. It is significant that, when Middle East oil production slowed down in the early 1980's, other regions made up most of the difference. This meant that the effect of regional

disruptions on global production was less marked than in the early 1970's. The Middle East is now returning to the greatest producer of crude oil.

North Sea oil production is incapable of satisfying European needs. However, it could be an instrument in managing external dependence. If North Sea production continues at 6000-7000 kbbl per day, it could extend until 2025 – at which point European demand could be in excess of 25000 kbbl per day. If production were raised to 8,000-9,500 kbbl per day, no more than 10 years' production could be assured, against a demand growing to more than 20,000 kbbl per day.

In both these scenarios, demand would continue to rise, while North Sea production would fall dramatically. Under both scenarios, new sources would be needed to fill the gap. In fact, North Sea oil production is already close to decline.

The North Sea is one of the most expensive areas for oil production, not least because of the high cost of deep-sea exploration and extraction. New technologies might bring these costs down, but it is likely that exploration and production costs will continue to be up to three times higher in the North Sea (\$8-10+bbbl) than in the Middle East (\$3-5). Depending on the market price for oil, this factor could continue to make the Middle East Europe's favoured source of oil.

Natural gas

Gas production has risen across the globe over the past 10 years to cope with growing demand. Within the EU, based on current prices, production is expected to decline within 5 to 10 years, leading to a greater dependence on imports.

Supply costs, usually consisting of production and transportation costs, may increase in the future due to rising distances, although lower wellhead costs might outweigh some of these increases. The extent to which this will affect the market position of gas will be dynamically determined by demand and supply in a competitive energy market. For the time being, gas prices are indexed to oil and do not mirror the supply costs involved. Due to inter-fuel competition and the possibility of substituting gas by oil in most market sectors, oil prices are likely to remain important also in relation to gas prices in the future.

Liquefied natural gas (LNG) production is growing, and will increasingly become an attractive alternative to conventional gas due to technological progress exerting downward pressure on the supply costs. LNG is also a means for bringing gas into Europe from more distant gas fields. Increasing the processing capacity of ports around the Union is a potential instrument of improving the security of gas supplies.

Solid fuels

Hard coal production across the globe has grown over the last 25 years and is likely to go on expanding because of rising demand from developing countries. In 1999, coal production in the EU-15 was 100 million tonnes, out of a total consumption of 247million tonnes, almost all of it dependent on subsidies. Production within Europe is falling and is likely to continue to do so as traditionally large producers continue to scale down production – as was seen in the UK in the 1990's. A similar trend is apparent in new member countries, for example, Poland, where accession is likely to speed up the slimming down of their coal (mainly lignite) industry.

A key factor in coal production is cost. Despite its leading position as a developer of clean coal technology, the EU is at a disadvantage for structural and geological reasons. It has many deep mines which are expensive to operate. Drastic cost-reduction programmes have taken place in Germany and the UK which have reduced their cost and raised productivity – the UK now has the highest productivity among EU producers, but levels of production have been slashed. Similar developments are taking place in France and Spain. Compared to USA, Canada, Australia and South Africa, productivity in the EU is relatively low. Poland's productivity is several times lower again.

Despite the vast hard coal reserves of the EU and applicant countries, most EU hard coal production has no future without subsidies. Belgium has already ceased indigenous production. France plans to do so by 2005. In the UK, the price of coal delivered to generating companies lies above world levels. The UK coal industry is the only EU one to operate without state subsidies, but the number of operating mines and employment in the coal industry are a fraction of what they were 10 years ago. It is now proposed to reintroduce state aids for the coal industry. The question of state aids to the coal industry goes beyond the scope of this document but may be an issue in energy supply security policy.

Eastern European developments are dominated by trends in Poland. Overall, consumption is falling – from 166 million tonnes in 1990 to 118 million tonnes in 1998. The same period saw falls in production, mainly of lignite, from some 178 million tonnes to 135 million tonnes.

Economically, coal offers the advantage over oil and gas of relatively stable prices, partly due to an excess of supply over demand. Over the last 15 years, average coal import prices have fluctuated by no more than 20\$/tce, compared to over 120\$/tce for crude oil.

Nuclear

Since around 1984, substantial quantities of uranium, coming from inventories, USSR or CIS countries, or from uranium no longer needed for defence purposes, have been put on the market, resulting in an oversupply situation and a substantial and prolonged price decrease. This price decrease caused the closure of many uranium mines in the world. This situation could last several more years, but the availability of these secondary sources is by no means guaranteed.

Uranium production has been lower than requirements since 1990 due to mines closing or slowing production, the shortfall being made up from secondary sources and utilisation of MOX (Mixed Oxide fuel). Current annual world uranium production is 31.000 tonnes, compared with needs of some 60.000 tonnes. Secondary supplies (stocks, military material, recycling) cover the gap. Within the EU-15, uranium production, which used to represent 3% of world total, is being phased out, such that EU could become exclusively dependent on imported uranium for its annual 20.000 tonnes needs.

Uranium prices are currently very low (7-10\$/lb U308 or 18-26 \$/kg U), due to the excess of supply over demand. The effect of secondary sources and possible early phasing out of reactors creates an uncertain market future.

Nuclear electricity costs are much less sensitive to fuel costs than electricity from coal, gas or oil.

Uranium production is dominated by a relatively small number of operators: 3 uranium producers cover more than half of production. There is a large degree of consolidation among the fuel cycle industry – 2 major traders, 5 major converters, 4 major enrichers, 3

major fabricators, with 2-3 smaller ones, and 2 reprocessors. Despite the existence of an oligopolistic market, competition is intense.

The growth of the nuclear industry in the developed countries has been dramatic. Security of supply considerations were one of the main motives to opt for nuclear energy. From a small base in 1970, nuclear production now accounts for up to 75% of electricity generation (France). However, the picture varies across the EU. Nuclear installations are unevenly distributed in the EU, with widely differing capacities. Some countries have never produced nuclear, some (Italy) have phased it out, while the average among those EU countries which produce nuclear energy is around 42%.

Nuclear generation as a percentage of electricity is still growing, mainly as a result of more intensive use of installed capacity. Nuclear energy production in the EU grew by 3% between 1998 and 1999.

Nuclear is also an important source of power in Central and Eastern Europe. In some of these countries, closures of old Soviet-type reactors are scheduled between 2002 to 2009 and alternative sources of electricity will need to be found.

Unique among energy sectors, the nuclear industry is subject to supply policy rules under the Euratom Treaty. This gives the Euratom Supply Agency an exclusive right to conclude or, under some conditions, to refuse contracts (its right of option has never been used). In the interests of EU supply security, the Euratom Supply Agency recommends that EU users keep a sufficient inventory to cover at least one year and maintain a portfolio of diversified, long-term contracts at equitable terms with primary producers. With regard to supplies from the NIS, the Agency applies a policy of reasonable dependence, which has been endorsed by the Court.

EU production of nuclear electricity has not yet reached its maximum capacity, but this capacity is likely to be reduced in the near future as a result of phasing out of nuclear plant. This includes both old plants being taken out of production and operational plants being closed as a result of political decisions, such as in Sweden and Germany. If the lifetime of EU reactors were to be extended, as in the US, this reduction in capacity would be delayed. The test for environmental and supply security policy will be how the energy from these plants is replaced – or saved; more specifically, whether adequate renewable generation can be provided to replace lost capacity, whether new nuclear supplies will come on stream or whether the use of fossil fuels and imported sources will increase. The first two face technical, social and market barriers, while the third contradicts environmental commitments.

c) Demand

Oil

Oil demand has continued to rise and is likely to continue this trend in the foreseeable future. Presently, global daily oil demand is at around 78 million b/d and is growing at 2.25% per year, which is far above the annual 1.4% which prevailed during the 1988-2002 period. Although the oil 'shocks' of the 1970's led to diversification in many sectors, oil remains the dominant fuel of the transport sector, where it represents over 98% of market share. In an emergency, the possibilities for substituting oil in transport are currently extremely limited.

The price of oil has, with the exception of the 1970's, had relatively little effect on the trend of growing demand. Demand for oil continues to rise, although the price of oil over the last 30 years has been more volatile than over the previous 100 years. Over the longer term,

the energy intensity of oil appliances has decreased by a factor of 50% since 1973, not least due to consumer demand. Over the same period, with the exception of transport, oil has been widely replaced by alternative fuels in the industry, heating and energy generating industries.

As oil demand rises, rises in oil production are necessary. This is already leading to increased costs as demand threatens to outstrip supply, as well as increased emissions of pollutants. Without a technical breakthrough, transport is likely to maintain a growing appetite for oil and could account for up to 65% of oil demand by 2020. Although energy efficiency and environmental requirements have reduced the energy intensity of most forms of transport, the increase in usage has more than cancelled out any energy savings. Unless alternative technologies are developed, for example fuel cells for cars, then the anticipated rise in transport needs will further increase the demand for oil.

Natural gas

Gas demand has risen across the Community over the last 10 years, representing a growth in market share from 16% to 21%, albeit at uneven rates. Gas demand is likely to continue to rise rapidly in the near future due to its having lower greenhouse gas emission than coal and oil and due to the increased efficiency of combined cycles in electricity production. On average, the market share of gas is estimated to rise from 21% in 1998 to 27% in 2020. Two thirds of the increase in demand is accounted for by power generation, including CHP (Combined Heat and Power). The anticipated growth in demand will make it necessary for the EU to find new suppliers. This is likely to mean looking farther – Iran, Irak, Qatar and Turkmenistan - countries from which imported gas can cost up to 2 times that from Algeria or Libya, due to transmission costs.

Solid fuels

EU coal demand is following a determined downward trend, due to the wide-scale removal of coal from domestic households, the substitution of coal generation by gas and the restructuring of the steel industry. Domestic production is falling even more quickly, leading to a slight increase in imports. Imports are not rising as quickly as they would have if EU coal demand had remained constant.

Enlargement could benefit the EU's coal balance if Eastern European coal satisfied some of the demand in the existing EU. However, a more likely scenario is that restructuring in new member states leads to new falls in production without corresponding falls in demand. The net result is likely to be increased dependence on coal imports.

The medium term projection is that demand for coal would increase after 2010, especially for power generation, due to price increase of oil and gas and the decommissioning of ageing nuclear power plants.

Nuclear

EU demand for uranium has stabilised at about 20,000 tonnes per year, it is only partly fulfilled by fresh production, and the gap between production and requirements is likely to remain for some time, as secondary and non-commercial sources are being run down. Currently MOX contributes around 3,000 tonnes per year of uranium equivalent.

Future trends in demand are unclear given the uncertain future for nuclear power in several Member States. Demand for uranium in the EU will increase if nuclear generation increases. This will create greater dependence on external resources, e.g. Russia, Canada and Australia including uranium no longer needed for defence purposes. Recycling spent fuel

and using fast breeder reactors could moderate this increase. Demand for nuclear energy will be strongly affected by demand for electricity on the one hand and the capacity to generate electricity (cleanly) from renewables and coal.

2.3.1.2 Renewable energy sources

Renewable energy sources (RES)

The major RES sectors are wind, photovoltaic (PV), solar thermal (solar thermal power plants and solar energy in buildings), hydro (small and large scale), biomass (with and without waste) and geothermal. Their obvious attraction in terms of energy supply is that they are either naturally occurring or can be replaced quickly, do not need to be imported, and in general have less impact on the environment than conventional energy sources. In the long term, with appropriate development and promotional support, they could help significantly to combine secure energy supplies with a healthy environmental and economic performance.

Renewable energy sources are currently unevenly and insufficiently exploited in the European Union. Some countries, such as Austria and Sweden, France and Italy have a large renewables sector, some, such as Germany, have intensive programmes or legislation in favour of renewable and some have little exploitation of renewable sources. In one renewable sector, large hydropower, potential EU capacity has been almost fully developed, while in others, such as PV and solar thermal, very little potential has been tapped. The renewables industry has created many new jobs, around 15,000 in the Danish wind industry alone. Although their potential is significant, renewable sources of energy make a disappointingly small contribution of around 6% to the Union's overall gross inland energy consumption, of which 4% is hydropower.

The problem of increasing the supply of renewable energy is made greater by enlargement, given the dependence of new member countries on traditional energy sources. However, enlargement also gives the renewables sector a promising opportunity: the need to replace old plant coupled with the demand for environmentally friendly technologies make renewable energy sources particularly interesting. However, present market conditions do not favour the competitive position of renewables.

The contribution of renewables to energy production across the EU (EU15) has risen slightly since 1990 – from around 5% to around 6%. They represent around 14% of electricity generation – a figure that was fairly constant throughout the 1990's. This figure disguises significant real rises in RES production (over 30%) because energy demand also grew over the same period. It also does not reveal the growing interest in renewables among conventional energy sectors and financial institutions, shown for example by recent substantial investments made by several of the world's leading energy companies.

Large-scale hydropower is the largest renewables producer. The major growth sector in renewables is wind, which grew 1,275% between 1987 – 1997, from 46 ktoe to 631 ktoe. Solar thermal production more than doubled over the same period, from 146 Ktoe to 323 Ktoe. Biomass grew by almost a third, from 39.976ktoe to 51.676ktoe. Geothermal and hydro also increased, by 27% and 18% respectively. In 1997, EU RES production totalled over 80 Mtoe, an increase of 27% over 1987. This growth pattern has also coincided with more reliable and better smaller applications for renewable energy sources.

Renewables production in the EU varies widely among Member States. Sweden (hydro), Austria (biomass and hydro), France, Italy and Spain account for over 77% of all EU renewables production.

RES exploitation faces technical and socio-economic challenges. It is therefore essential to address both at once. Under present policies, the contribution of RES to primary energy consumption is unlikely to increase dramatically. Changing pricing mechanisms such that external (environmental, health, social) costs are included in energy prices would increase their attraction, as would the aggressive marketing of the most advanced technologies. Such measures could bring down the relative price of renewable energy and produce economies of scale and thus significantly boost the role of renewables.

Much RES technology is still at a relatively immature stage of development, compared with conventional energy technology, moreover, new entrants often have a difficult task in entering traditional markets, and energy is no exception. Against this background, without strong customer incentives and mass-marketing, government pressure and publicity, the full potential contribution of renewable energy to energy supply will probably only be fully realised in the medium to long term.

Hydropower (hydro)

Of all renewable sectors, the large-scale hydro sector is the best exploited and perhaps most mature. Hydro represents about 90% of all EU RES production and supplies some 14% of electricity demand in the EU. Hydropower is a particularly attractive option in mountainous regions. In Europe, however, most economically feasible sites have already been exploited. Although small hydro currently represents only 3% of all hydro production, the main growth in this area is likely to be in small scale hydro (< 10 MW) for local, decentralised generation. Small-scale hydro has high efficiency and potentially low installation costs (depending on the size of installation and location). A growth of some 2500MW is anticipated by 2010. Decreases in head height, variable speed generators, reductions in the cost of equipment and environmental mitigation technologies will enhance the attractions of mini-hydropower.

Wind

Installed capacity for wind energy more than doubled in the 1990's and the potential is for a further dramatic growth. It is estimated that a quadrupling of market potential is possible by 2020 (world-wide the potential growth is even more dramatic). In the long term, and subject to tackling technical and local planning barriers, wind energy could have potential to contribute up to 30 % of the current electricity demand (15% of the overall primary energy in the EU). As new technologies for offshore installations, lighter structures and variable speed generators come on stream, the contribution of wind to the energy balance is likely to grow significantly, with greater capacity wind turbines and large dispersed wind farms. This makes wind energy a potentially powerful instrument in energy supply policy, subject to stability of production and electricity storage or back-up possibilities.

Photovoltaic (PV)

PV production is on a very small scale in the EU. Cost is a decisive factor – installation costs of 5,000 €/kW compared with 1,000€/kW for wind, and production costs – at 0.32€/kWh in Southern Europe - more than 5 times that of wind. Costs in Northern Europe are around twice this figure. PV is not highly dependent on local conditions, providing that there is direct light (not necessarily heat) from the sun.

Installed capacity has not grown as quickly in the EU as in the rest of the world. However, it is estimated that a significant market potential exists – perhaps as high as 2,000 MW in 2010, compared with 52 MW in 1995 and around 200 MW in 1999. Current market growth is around 20% per annum.

The future of PV production in the EU is likely to be decentralised – integration into buildings and multiple purpose installations, or the development of PV kits. PV is very attractive in urban situations where space is limited. Even today, PV is cost-effective in many off-grid applications.

Overall, unless the price can be brought down quickly, PV is unlikely to be a significant contributor to the energy balance in the short term, but will be an important factor in electricity supply in specific local situations. However, its theoretical potential is highly interesting for longer-term supply security, a fact reflected by the interest in PV among energy actors traditionally active outside the renewables field.

Solar Thermal

Solar thermal collectors, which produce low temperature heat for domestic applications face similar economic barriers to PV, although they are less dramatic – a production cost of 0.12 €/kWh and installation costs of 2,500 €/kW. Installed capacity world-wide has rocketed in the 1990's although the rate of growth in the EU has been relatively small. It is particularly attractive to integration into buildings as a replacement for gas or oil in heating or hot water installations.

Solar energy has further uses in buildings, such as for lighting and cooling, which can significantly reduce energy demand. Even in northern parts of the EU, its potential for applications in new and existing buildings, including private homes, is enormous.

Biomass

Biomass as an energy source, with or without other fuels (solid fuels/wastes) is now commercial in unit sizes of 10-30MW. Small, decentralised Combined Heat and Power (CHP) applications are of increasing efficiency and importance. Production costs are comparable with wind energy, although installation costs are somewhat higher (1,500 EURO/kW – depending on the plant scale and technologies used). EU capacity did not increase substantially over the 1990's. However, predictions of market growth are positive, not least because of investment in technology development projects. It is estimated that market potential in the EU could rise from 3,862 MW in 1995 to 8,766 MW in 2010. In the long term, Biomass has a theoretical potential of up to 20 % of current primary energy (assuming 20 million ha of arable land for fuel crop with a yield of 6 toe of biomass per ha and the availability of 150 Mtoe of waste biomass).

Future trends are likely to be towards larger unit sizes of 50-100 MW and increases in efficiency of up to 50%. New technologies, including biomass-integrated gasification combined cycled plants, are increasing the efficiency of biomass generation for electricity. Efficiencies of up to 80% are possible in CHP operations. Multi-fuel operations are likely to be enhanced, in particular as the result of incorporating biomass use into CHP installations. A significant proportion of new sources will come from the agricultural sector, in particularly wood fuels and liquid biofuels.

There is a potentially large market for biomass applications in decentralised plants, especially CHP, and for substituting fossil fuel in electricity generation. Also, co-firing biomass in existing and new power plants is economically feasible and has great potential in the EU and beyond. Finally, small-scale applications, e.g. biomass and pellet stoves, could be widely applied in a short time-scale.

Geothermal and Heat Pumps

Geothermal energy depends on similar technology to the oil industry. 'Hot dry rock' technology aims at 'mining' heat of 200–250°C which is available in many places in the EU at a depth of 5,000 m. The installed capacity in the EU has risen gradually in the 1990's and is likely to continue to do so, but the market potential by 2010 is unlikely to exceed 2,700MW, unless costs can be brought down. In order to increase this potential, low enthalpy sources need to be exploited and exploitation of proven reserves must be intensified. Heat pumps are devices which concentrate renewable energy from the air, ground or water to provide energy for space or water heating. The ratio of heat out to energy in (coefficient of performance) can be as high as 5. Of the 20 million residential dwellings in the EU heated by electricity, potential savings of 200 TWh/year are possible, and in addition comparable savings could be possible by converting the 23 million dwellings that are oil heated to heat pump systems as well.

2.3.1.3 EU growing external dependency in the field of energy supply

The EU is relatively poor in conventional energy reserves. However, this fact has not affected the rise in energy demand over the previous decades and is not expected to act as a brake on consumption for the foreseeable future. As a result, Europe is increasingly dependent on imports.

2.3.1.3.1 European imports by energy commodity

a) Oil

Europe currently imports around 80% of its oil. Norway is the biggest exporter to the EU-15 (17%). In the EU as a whole, suppliers are varied, which means that a local disruption would have limited effects on the overall economy. However, the situation differs in individual Member States, where a small number of suppliers often provide a large proportion of market needs. New member states are largely dependent on former Soviet Union countries. Although EU oil imports have fallen over recent years, it is expected that they will rise to nearly 90% by 2020.

OPEC states are a major source of imported oil. International oil prices are not subject to free market principles. OPEC exerts a strong influence on oil trading markets, and can put the EU, as buyer, in a weak position.

The issues for oil imports are multiple. First comes the strategic management of domestic resources, mainly North Sea reserves. Second, infrastructure links must be adequate, particularly with the Middle East, which is likely in the long term to become our major supplier. Pipeline links have added safety attractions over shipping. Finally, the capacity and political will must exist in exporting countries to satisfy growing demand world-wide. This is the most uncertain aspect and could have a significant impact on price.

b) Natural gas

The current issue for gas imports is less that of reserves and more that of bringing gas supplies to the market at competitive prices, both within the EU and from external sources. Currently, the EU's principal suppliers of imported gas are Russia (17% of total EU-15 gas demand), Norway (11%) and Algeria (12%). On the basis of already contracted supplies, their shares will increase to 38%, 34% and 23% respectively by 2020, subject to new supply contracts. In terms of security of supply, Norway, as a member of the EEA does not

constitute any risk. The dependence on Russia is likely to increase considerably as a result of enlargement. An economic risk arises from the cartelisation of Russian suppliers. Overall, mutual dependence between Europe and its external suppliers has created, and is likely to continue to create, a stable framework for future reliable gas supplies to the European market.

Although most Algerian gas and all Russian gas is shipped by pipeline, Europe will probably require greater import capacity to cope with the increased demand for imported gas.

The level of import dependence is forecasted to rise significantly in the near future: from 40% today to 66% in 2020. Some Member States are already completely dependent on imports. Others will see their dependence rise close to 100%. Depending on the progress of the enlargement process, the average percentage may increase even more. The current cost of importing gas is contained because of the geographical proximity of Europe's principal suppliers. However, the cost of transporting gas rises in proportion to the distance covered, and in the case of offshore gas pipeline, costs can rise significantly beyond a distance of 800-1000 km. Although no accurate estimates exist, the cost of importing gas to the EU from Siberia (4000 km away), for example, could have a serious impact on market prices in general, perhaps doubling gas prices. Costs are also likely to rise as gas may have to be produced under technically more challenging circumstances (deep water offshore, permafrost regions). These could at least in part be counteracted by technologies for more reliable exploration, higher depletion rates of existing fields and higher working pressure in pipelines. Over short distances, LNG is relatively expensive to transport, but it starts to become economically more attractive than pipeline gas at distances over 4,000-6,000km. Improved LNG technologies are bringing costs down along the whole LNG chain. As a consequence, LNG supplies will become increasingly competitive.

New suppliers from North Africa, the Atlantic, Middle East and Central Asia are likely to tap the European market, thereby reducing overall dependence on a single region. However, there is currently uncertainty about the long term likely sources of gas to the rapidly growing markets of East Asia. In the event that Russia and the former Soviet republics are called upon to supply this region as well, EU countries could face significant competition and increased prices. The level of reserves in the Middle East and its relative proximity to the EU suggest that, in the future, dependence on Middle East gas is likely to increase. Pipeline connections to this region, which might accommodate gas and oil, could help to stabilise long term supply. Ultimately it will be for the market to decide. A stable political environment providing reliable investment conditions in the countries is key in this respect.

c) Solid fuels

Imported coal is far cheaper than domestically produced coal. At an average of 42€/tce, imported coal costs a fraction of, for example, German coal, at 143€/tce. Coal imports come from a wide range of countries, but mainly from Australia, Canada and USA. This factor reduces the risk element of dependence on imports. Providing that these reserves are available to European markets, there are more than sufficient alternative low-cost reserves accessible to markets in other parts of the world.

d) Nuclear

In terms of import dependence, uranium is available in limited quantities within the EU, but in the long term dependence on imports is almost inevitable. Thus, in terms of security supply, the EU is increasingly dependent on imports of natural uranium, unless recycling or breeding is used. However, it is possible to stockpile several years of requirements and to diversify supply sources. The EU's largest suppliers of uranium are Russia, followed by Niger, Australia and Canada. After rising steadily in the 1990's, the market share of Russia

and other uranium exporting republics of the former Soviet Union is tending to stabilise. The rising trend is likely to resume following enlargement.

2.3.1.3.2 European energy imports by country

With the exception of Norway, United Kingdom and, more recently, Denmark, European countries are net importers of energy. European Union imports about 50% of its primary energy consumption and the dependence rate increased from 51.6% in 2000 to 52.4% in 2001. 'Candidate countries' as a whole have a much lesser dependence rate, due to the low dependence level of Poland, Romania and Czech Republic, but several countries do not cover 50% of their energy needs.

2.3.1.3.3 Risks and challenges in European energy supply

a) Diversity of risks

Physical risks

Physical risks involve permanent or temporary disruptions. Permanent physical disruption can occur when an energy source is exhausted or production is permanently stopped. There are also temporary disruptions the consequences of which can be disastrous as well, both for the consumers and for the economy in general (for instance damages caused by storms and other natural hazards).

A particularly important and insufficiently highlighted aspect is the occurrence of oil production peaking for geological reasons. Oil production peaking does not mean that oil reserves are depleted, but rather that global production declines although all oil producers are producing at their maximum capacity. The probability of oil production peaking is 100% sure. Uncertainty only concerns the date. Various experts expect peaking occurring before 2020 and even earlier. The oil production of the USA peaked during the 1970s. Imports were then substituted to inland oil production. When oil production peaking occurs at world scale, there is no alternative possibility for oil supply. In such a context, the remaining oil reserves (which are still substantial) are exploited under complete disruption of the balance between oil supply and oil demand. The result is not only an enormous jump in oil prices (which cannot even be properly quantified), but also scarcity in oil supply.

Economic risks

Economic 'disruptions' are caused by erratic fluctuations in the price of energy products on the European and world markets. The European market is linked to prices on the world market. Oil and gas account for over 60 % of fuel consumption in the residential and tertiary sectors. Transport accounts for half the outlets for petrol. The rise in fuel prices, mainly oil and gas, creates monetary and trade imbalances which are harmful to the EU's economic health. There is a clear relationship between physical risks and economic risks. In case of temporary or permanent disruption, the balance between supply and demand is broken and energy prices can change very rapidly, generating significant economic problems.

Political risks and risks of terrorism

In the present context, risks related to geopolitical factors and to terrorism are particularly high. The situation in the Middle East is by far the best illustration of the issue, but risks are

unfortunately not limited to this area. In a context of strongly growing oil demand and moderate growth of oil supply, geopolitical tensions are likely to expand at world scale.

Political risks are also related to cartelisation (OPEC, possible cartelisation of Russian gas suppliers).

Environmental risks

Energy production and transportation are very sensitive in environmental terms. Major accidents in nuclear power plants (Long Island, Chernobyl) are outstanding examples of such risks. Accidents of oil tankers (Erika, Prestige etc.) are also responsible for disastrous pollutions of wide coastal areas.

Social risks

The instability of energy supplies, whether linked to erratic fluctuations in prices, relations with producer countries or a chance event, may cause serious social disruption. Today, petrol is vital for the functioning of the economy. Any disruption of supply is likely to lead to social demands, if not social conflict. Current events show that increases in fuel prices can also incite corporatist behaviour.

Energy crises

Energy crises occur when demand or supplies suddenly move away from the prevailing equilibrium level, resulting in dramatic price movements with a great impact on the economy of the producer or consumer countries. Outstanding examples are the energy crises of the 1970s.

b) Challenges of energy transportation towards and within the EU

Given the increasing dependence of the EU on external sources of energy, the question of transportation and transit will become a crucial element of the question of security of supply.

The growing demand of the EU for external supplies of energy will place additional pressure on existing supply routes and necessitate the development of new routes. The prospect of enlargement is likely to place an additional demand on imports from Northern Europe, NIS and Southern Europe (the Mediterranean Region). Currently the systems do not exist to transport the quantities that will be necessary to satisfy this increased demand. Most of the world's energy reserves are at some distance from Europe.

Political issues are of major importance for many transit routes. As illustrated by the political sensitivity surrounding the Caspian Sea, the conflicting political positions of countries involved in the transit of energy create difficulties and uncertainties which affect transit. In the Middle East, for example, until the end of 1995 every one of 8 petroleum pipelines in the region was shut down at least once since the first was built in 1931. In many cases this was due to political reasons. Another study recorded 27 natural gas 'transit events' in the Former Soviet Union between 1.1.1992 and 31.12.1994. 10 of these were related to negotiations or renegotiations of agreements, 6 threats to supply, 3 irregularities in supplies and 8 actual cuts or reductions in supplies.

One major difficulty facing the development of new transit routes is the capacity to invest in the construction of new routes infrastructure from increasingly remote areas to the EU market, or even maintain and or upgrade existing routes. Many governments in Eastern Europe have limited means to invest in new gas and electricity capacity. Lack of investment

leads to deterioration of existing pipeline systems, which inevitably leads to problems in transmission.

Indications are that changes in the geographical positioning of gas supply and demand will move demand westwards as the EU increases its consumption whereas the supply of gas moves eastwards, as indigenous resources in continental Europe are gradually depleted and replaced by imports, mainly from Russia. The result of this would be that the routes needed to supply the market get longer and longer. The most accessible fields have been developed and are producing. Domestic reserves in the EU will be on the decrease, which combined with rising demand for gas will necessitate increasing imports from outside the EU. For this reason, there will be a need to turn to more distant areas and produce under more hostile circumstances. As a result, production and transportation costs are likely to increase.

The issues of electricity transmission are different to those of oil and gas. They are dependent on local/regional patterns as well as the development of the internal market. In general there is less need for the transit of electricity than for oil and gas. Electricity is not a primary energy source and is less bound by geography in terms of generation, which is usually located closer to the demand source.

Towards increasingly politicised relationships in energy supply

The context for European energy supply policies has changed over the last 30 years as a result of political, environmental, economic and energy market developments. Policies for secure energy supply must respect these new political needs and objectives. Recent developments in energy markets and related policies create new tensions and constraints for governments and administrations by, on the one hand, providing additional targets, as in the case of climate change, but removing traditional instruments, such as direct management of utilities.

Under trend assumptions, the Community's overall dependency will rise from today's 50% to about 60 to 70% in 2020. Especially critical is the import share of oil and natural gas. Imported oil is likely to increase from 80% of total EU oil supply in 1997 to 87% in 2010. Gas imports are forecast to rise from 40% today to 66% in 2020.

Considering the external energy dependency of the EU and given the internal market, it may be that the EU has no other alternative but to develop a coherent energy security policy that addresses the current asymmetry in exposure among the member states. A further consideration is the physical distance and existence of infrastructure between the EU and its suppliers.

Growing imports are not in themselves a threat to security supply, but they highlight the importance of good trade links, communication and political relationships with external partners:

- North Africa, the Persian Gulf, the Caspian Sea Region and Russia are neighbouring regions of the enlarged EU and are all economies that are important trading partners.
- relations with Russia should be strengthened and reflect the economic and political importance and the already existing inter-dependence between the EU and Russia. The Russian block, at least in energy terms, is very strong because it is the only oil and gas exporting block.
- the potential of Turkey to become an important country for oil and gas transit from Russia, the Caspian Sea Region and the Persian Gulf adds to its strategic importance in relation to the EU.

Due to the growing energy import dependency of other main consumer regions, such as the US, India, China and other Asian countries, energy relations will become increasingly politicised. Intense competition will break out among the main large consuming blocks. For the EU which is firmly embedded into the multilateral system and the liberalisation of markets, specific efforts would be needed to adapt to the new approach.

2.3.1.4 Structure and trends of energy consumption in Europe

2.3.1.4.1 Primary energy consumption

a) Primary energy consumption by sources

During the period 1995-99, the primary energy consumption of EU-15 has slightly increased, in particular as far as gas is concerned. During the same period, the 12 candidate countries have reduced their primary energy consumption, in particular as far as solid fuels (coal, lignite) are concerned.

Impacts of EU enlargement on primary energy consumption

Comparing the EU-15 countries with the new member countries, the main energy systems differences come as follows:

- EU-15 countries rely less on solid fuels (15% against 38%) and more on natural gas;
- Coal is still very important in the new member countries because of the important endogenous proven reserves. Some capacity has been closed, because of the huge environmental problems (CO₂ emissions and acid rains) while the productivity has been improved in the coal mines of certain countries;
- There is a substitution movement from coal to natural gas for electricity production;
- Industry as an energy consuming sector has lost importance because of the structural political and economic reforms experienced in these countries during the nineties;
- The nuclear power stations in some countries have severe security problems and negotiations are or have been done with EU along the negotiations process in order to close some of the most sensitive reactor;
- Renewable energy sources other than hydro have some important barriers in the new member countries. Excess electricity generation capacity in some countries, still subsidized prices and lack of financial incentives are among some of the most relevant barriers.
- The energy market reforms are still being conducted and will approach the *acquis communautaire* in a near future. The public ownership of energy utilities is still very important in some countries.
- Huge investments in the energy sector are necessary to increase competitiveness and improve the energy services quality.

Enlargement is likely to confirm the current trends in energy provision and use: rising consumption, growing demand for conventional fuels and increasing dependence on imports.

In general, the new member countries have a similar balance of energy supply and demand. However, there are differences in the operating environment, such as the age and technical performance of infrastructure and plant, including nuclear. Enlargement brings additional factors to play in the supply security debate. For example, import dependence on mostly one source (Russia), the dominance of solid fuels, different legal and regulatory frameworks, the predominance of state-owned, vertically-integrated monopolies, low energy efficiency, obsolete technologies and persistent technical difficulties. In particular, the threat of demand outstripping supply is increased.

It is likely that dependence on gas among the new member states will rise more quickly than among old members and that indigenous production of coal will be slashed. Both factors will aggravate import dependence, in particular from the former Soviet Union. It will make the eastern part of the Union largely dependent on one supplier. Currently, apart perhaps from Russia, the systems do not exist to transport the quantities which will be required to satisfy growing demand. Links to key-non Russian suppliers are lacking. Also there is a need for links to be created to and within candidate countries.

b) Primary energy consumption by country

In the EU, the largest consumers of primary energy are Germany, France, the UK, Italy and Spain. Among the new member countries, Poland is the largest consumer.

2.3.1.4.2 Final energy consumption

a) Structure of final energy consumption by source and country

There are wide differences among EU countries as far as the shares of sources in final energy consumption are concerned.

b) Structure of final energy consumption by sector and country

2.3.1.5 Projections, forecasts, technological developments

2.3.1.5.1 Projections and forecasts

Reference scenario of the WETO report

a) Basic assumptions of the WETO reference scenario

The WETO study describes a Reference scenario that provides a description of the future world energy system, under a continuation of the on-going trends and structural changes in the world economy (a 'business and technical change as usual' context). The scenario results should be seen as a benchmark for the assessment of alternatives, particularly with respect to resources, technologies and environmental policy. A sound understanding of the long-term issues is a key element in establishing future research and technological development priorities in the field of energy and environment. The Reference scenario does represent a baseline performance which can be bettered if appropriate policies are put in place. This outlook is based on the results of the POLES model. This simulation model, developed and used under different EC programmes since 1994, allows to elaborate long-

term energy supply and demand projections for the different regions of the world under a set of assumptions concerning, in particular, economic growth, population and hydrocarbon resources

A particularly important assumption is that sufficient oil reserves exist worldwide to satisfy the projected demand during the next three decades. The decline in conventional oil reserves may constitute a preoccupying signal only beyond 2030. This assumption is considered in the present ESPON scenario as not totally realistic. The probability of oil production peaking at world scale before 2020 is unfortunately relatively high (see section 'physical risks' above as well as next section on scenarios of oil production peaking).

A second assumption is that the reserves of natural gas are abundant and expected to increase by around 10% and that there is no constraint on coal reserves over this time horizon. While the assumption regarding coal reserves seems realistic, the one related to gas reserves seems too optimistic.

Other assumptions concern the evolution of energy prices, and in particular of oil price (35USD/barrel by 2030). Recent evolution shows that such assumptions are even less realistic.

Despite these restrictions, the results of the reference scenario are nevertheless interesting in various respects.

b) Main outcomes of the reference scenario

World energy demand is projected to increase at about 1.8%/year between 2000 and 2030. The impact of economic and population growth (respectively 3.1% and 1%/year on average), is moderated by a decrease in the energy intensity of 1.2%/year, due to the combined effects of structural changes in the economy, of technological progress and of energy price increases. Industrialised countries experience a slowdown in the growth of their energy demand to a level of e.g. 0.4%/year in the EU. Conversely, the energy demand of developing countries grows rapidly. In 2030, more than half of the world energy demand is expected to come from developing countries, compared to 40% today.

The world energy system will continue to be dominated by fossil fuels with almost **90% of total energy supply** in 2030. Oil will remain the main source of energy (34%) followed by coal (28%). Almost two-thirds of the increase in coal supply between 2000 and 2030 will come from Asia. Natural gas is projected to represent one quarter of world energy supply by 2030; power generation provides the bulk of the increase. **In the EU**, natural gas is expected to be the second largest energy source, behind oil but ahead of coal and lignite. Nuclear and renewable energies would altogether represent slightly less than 20% of EU energy supply.

Given the continued dominance of fossil fuels, **world CO2 emissions** are expected to increase more rapidly than the energy consumption (2.1%/year on average). In 2030, world CO2 emissions are more than twice the level of 1990. In the EU, CO2 emissions are projected to increase by 18% in 2030 compared to the 1990 level; in the USA the increase is around 50%. While the emissions from developing countries represented 30% of the total in 1990, these countries are responsible for more than half the world CO2 emissions in 2030.

World oil production is projected to increase by about 65% to reach some 120 million bl/day in 2030: as three quarters of this increase comes from OPEC countries, OPEC accounts for 60% of total oil supply in 2030 (compared to 40% in 2000).

Gas production is projected to double between 2000 and 2030. However, regional disparities in gas reserves and production costs are expected to modify the regional gas supply pattern in 2030: about one third of the total production will originate from the CIS, while the remaining production will be almost equally allocated among other regions.

Coal production is also expected to double between 2000 and 2030, with most of the growth taking place in Asia and in Africa, where more than half the coal would be extracted in 2030.

The **oil and gas prices** trend corresponds to a significant increase from current levels: the oil price is projected to reach 35 €/bl in 2030 with gas prices at 28, 25 and 33 €/bl in 2030 on the European/African, American and Asian markets respectively. The regional gas price differentials are expected to diminish significantly, reflecting more comparable gas supply mixes. The coal price is expected to remain relatively stable at around 10 €/bl in 2030.

The **final energy demand** will grow at a similar pace to the gross inland consumption. As all **sectors** are expected to experience similar growth, their share in final demand will remain roughly constant at world level: around 35 % for industry, 25 % for transport and 40 % for the residential and tertiary sectors. The energy demand by sector shows different patterns according to the regions: in developed countries, energy demand in the services sector is the fastest growing segment; in developing countries, all sectors experience sustained growth at 2 to 3 %/year.

Electricity continues its penetration in all regions, accounting for almost a quarter of final energy demand; coal declines in industrialised countries; biomass is progressively phased out in developing countries. **Oil** remains the dominant fuel, with a share ranging from 40 to 50 % in 2030 according to the region.

Electricity production increases steadily at an average rate of 3 %/year. More than half of the production in 2030 will be provided by technologies that emerged in the nineties and afterwards like combined cycle gas turbines, advanced coal technologies and renewables.

The share of **gas in power generation** increases steadily in the three major gas producing regions (CIS, Middle East and Latin America) and the share of coal decreases in all regions, except in North America where it stabilises and in Asia where it increases significantly. The development of **nuclear** power does not keep pace with total electricity production: its market share comes down to 10 % in 2030. **Renewables** covers 4 % of the production (from 2 % in 2000), mainly because of a rapid progression in electricity production from wind.

Scenarios of oil production peaking

As far as the date of occurrence of the oil peak at world scale is concerned, various scenarios are available:

- Campbell's depletion scenario sets the oil peak in the year 2010. While numerous oil producing regions will be in decline before 2008, the Russian production will remain almost constant until the decline sets in around 2010. The Middle East production will grow by about 50% from 2000 to 2010 and then remain constant until the decline sets in by 2025. The growth in total oil production from 27 Gb/year in 2003 to 31 Gb/year in 2010 will be covered by the growth of non-conventional production (heavy oil, deepwater wells, polar oil fields, NGL).

- Calculations provided by the World Resources Institute indicate that EUR (Estimated Ultimately Recoverable) oil resources lie within a range of 1800 to 2200 Gb. At the end of 1999, the world had consumed about 857 Gb of these reserves. Taking the hypothesis of moderate growth in demand (2% per annum), peaking could occur between 2007 (with EUR=1800Gb) and 2013 (with EUR=2200 Gb). If oil demand were held constant at the level of the year 2000, the oil peak's occurrence could be delayed by several decades.
- Calculations made by an outstanding Iranian expert (Mr. A.M.S. Bakhtiari) suggest that oil output could peak at around 81 million b/day by 2006/2007 and then steadily decline to about 55 million b/d by 2020. Under no scenario could his model be simulated to peak after 2008.
- The US Energy Information Agency (EIA) presented in 2000 a number of scenarios, using a relatively simple algorithm and different assumptions as to ultimate reserves, annual consumption growth rates and production decline after the peak. The computation results in peak years ranging from 2016 to 2047.
- Calculations produced by the European Commission in the context of the WETO project indicate that 'sufficient oil reserves exist worldwide to satisfy the projected demand during the next decades. However, the decline in conventional oil reserves may constitute a preoccupying signal beyond 2030. It is only compensated by an increase in the reserves of non-conventional oil'. In the WETO scenario, annual reserve growth in the next decade exceeds annual production by a considerable amount. This is only possible through substantial increase in oil exploration activity, which might be favoured by present high oil price.

The WETO and EIA scenarios are however based on USGS assumptions which may be characterised as over-optimistic. The present attitude of the US government, attempting to secure as strongly as possible oil supply (Caspian region, Russia, Middle East, Venezuela) reflects increasing concern which is strongly contrasting with the USGS assumptions. Taking this into account, the possible occurrence of the oil peak between 2010 and 2020 does not appear as unlikely.

2.3.1.5.2 Nature and process of oil production peaking¹⁸

The process of oil peaking can easily be understood if one considers a single oil field. The exploitation process is composed of various phases. At the beginning of oil production, the natural pressure is generally sufficient to let the crude oil come up by itself (primary recovery). With increasing production, the pressure of the oil field diminishes and the water levels rise. After some time the production rate begins to decline. This trend can be controlled to a certain extent, so that the decline in production rate is delayed or reduced by injecting gas or water into the reservoir in order to increase the pressure, by heating the oil or by injecting chemicals in order to reduce its viscosity.

The world's largest oilfields were all discovered before 1950. Since the 1960s, annual oil discoveries have decreased regularly. Since 1980, annual consumption has exceeded annual discoveries. By 2005, 70% of daily oil supply came from oilfields already in production for

¹⁸ Publications on the process of oil production peaking are numerous. Following articles have been considered here:

- 'The world oil production capacity model' Paper presented by A.M. Samsam Bakhtiari at the International Oil Conference. Copenhagen. 2003.
- 'The countdown for peak oil production has begun; but what are the views of the most important international energy agencies?'. W. Zittel; J. Schindler. L-B Systemtechnik. 2004.
- 'Future of natural gas supply'. The Association for the Study of Peak Oil and Gas. 2004.
- 'New coal plants bury Kyoto Treaty'. www.peakoil.com/article1942.html. 2004.

30 years or more; 20% of global supply came from 14 giant oilfields whose average age of exploitation was over 50 years.

Oil production peaking follows – with a few decades delay – the peaking of oil discovery. Global discovery peaked at world scale already in 1964. Since then, annual oil discoveries regularly decreased. In aggregating the production processes of the various oil producing regions, a world-wide peak of oil production is generated, from which point production decline at world level is inevitable.

In the various oil producing regions, big oil fields had been developed first and only afterwards the smaller ones. When the first big fields had passed their production peak, an increasing number of new and generally smaller fields were developed. It became however increasingly difficult to sustain the rate of production growth. The smaller fields reached their peak much faster and this contributed to the overall production decline.

The strong increase of oil price from 2003 onwards had an important impact on investments in oil resource exploration. This made possible the discovery and exploitation of a number of second-rank oil fields, so that the oil production peaking did not happen before 2010, as was argued in the early 2000s by the most pessimistic experts, but some years after 2010. The new discoveries had made possible to postpone global production peaking by 7 to 8 years.

By 2005, numerous oil fields in the world had already peaked. Oil production peaking in the USA had occurred in the late 1990s. In the group of countries outside OPEC and the Former Soviet Union taken together, oil production peaking had occurred in the late 1990s. Critical for the stagnation of oil production in this group of countries had been the peaking of oil production in the North Sea which had occurred in the year 2000 (in 1999 in the UK and in 2000 in Norway). After the year 2000, only a very limited number of countries in this group – in particular Brazil and Angola – have been in a position to continue to expand their production. A decisive event for this group of countries has been the peaking of oil production in the oil field of Cantarell in the Gulf of Mexico, the world's biggest offshore field. During the 2000s, the production rate, which had already reached a plateau, could only be maintained by the massive injection of nitrogen. Finally, production peaking occurred in 2008. In China, oil production had already peaked in 2003, so that no oil export, but on the contrary sharp increase in oil imports could be observed. The production of this group of countries -taken together – had already declined by 6 to 7 million barrel/day in 2010 and, despite the fact that Angola, Brazil and the Gulf of Mexico increased their production after 2010 and that non-conventional sources (oil sands) were exploited (in particular in Canada), it further declined by 4 million barrel/day up to 2015.

The case of the Former Soviet Union is a particular one. Oil production peaked a first time at the end of the 1980s at a level of 12 million barrel/day. In the following five years, production collapsed by almost 50%. After the liberalisation of the oil market, production levels in Russia increased again very strongly. However, this fast recovery came to an end after the easily accessible fields had been developed and the financial and technological backlog had been closed. In the Russian part of the FSU, oil production peaking occurred (for the second time) in 2007/2008, while in Azerbaijan and Kazakhstan production doubled between 2004 and 2010. By 2015n it had already reached a plateau at less than 3 million barrel/day. The high sulphur content of oil in this region made its production cost particularly high.

In the Middle East – the core of OPEC – the situation in Saudi Arabia – the biggest oil producer – turned to be far less favourable than official declarations had ascertained for decades. The largest oil field in the world -Ghawar – discovered in 1948, had been exploited for more than 50 years. In the early 2000s, more water was already pumped into the field

than oil was extracted. Saudi Arabia has not been able to compensate for the decline of oil production in other world's regions. Other OPEC producers in the Middle East peaked long before Saudi Arabia. Oman's oil production, which had been one of the great success stories of the 1980s and 1990s, peaked at the dawn of the 21st century from 840 000 barrel/day to 703 000 barrel/day within two years. Already by the early 2000s, Iran was facing an uphill battle to compensate for the decline in its major south-western oil fields by ways of gas and water injection and minor offshore developments on buy-back basis. By doing this, Iran only succeeded in showing the decline. Even the big hope generated by the super-giant oil field of Azadegan had been gradually dying down as its potential was constantly down-rated. Encouraged by oil price increase, Iran accepted more exploration risks and invested also in state-of-the art technologies to improve recovery at its older fields. This, however, did not change fundamentally the general trends.

In Iraq, the extra-low production rate of the early 1990s allowed for a further 'plateauing' in known fields. Production in new fields ready for development (West Qurna2, Majnoon and Nahr Umar) as well as in relation to recent discoveries in the Western Desert, could not progress as much as expected, because of long-lasting troubles and terrorism which did not make the necessary investments possible.

2.3.1.5.3 *Technological developments in the energy sector: emerging new technologies*

New technology for energy production and use could change the whole supply security debate. Most forecasts and estimates relate to scenarios based on current technologies. These scenarios are likely to be relatively little affected by technological changes in the short term because energy technology generally has a long lead in period. Technologies which today are at the demonstration phase may yet take 5 years to become commercially attractive, in terms of price and proven viability. In addition, the willingness of consumers to invest in new technologies is curtailed by the long lifetime of energy installations or machinery (10-30years). Our ability to anticipate likely technological trends over a longer period (30 years) is limited because energy technology which is currently at a basic stage could become commercial over such a period – or it might be abandoned. Nevertheless, there are technologies under development today which have the potential to completely transform our current appreciation of energy demand and production.

Hydrogen technology and economy

In a fuel cell, hydrogen and oxygen combine to form water and the energy released produces an electric current. The reaction is electrochemical and the potential electrical conversion efficiency is up to three times higher than the useful energy produced by combustion. The conversion from hydrogen to electricity takes place with low emissions, and one application being developed is a replacement to the internal combustion engine. Although we are a long way from the hydrogen energy system, fuel cells could make a contribution by 2010.

In the EU, a major new alliance was formed to commercialise PEM fuel cell technology for transport applications. Two main systems exist. Each has trade-offs of cost, efficiency, and performance, and there is no consensus yet on which will predominate.

An important challenge for the generalisation of fuel cells is the production of hydrogen, which in all cases, consumes significant amounts of energy. Various technologies exist. The most conventional ones use fossil energy or nuclear electricity and are therefore neither a very promising nor an environmentally-friendly solution. New experimental technologies

produce hydrogen from solar energy, however in small quantities. Large-scale production of hydrogen in a sustainable way is unfortunately not a short-term perspective.

Another significant challenge to the widespread use of fuel cells is fuel infrastructure. This obstacle can be overcome gradually in the case of captive fleet vehicles with a limited service area, by the use of a central fuel storage and transfer facility. Progress is being made. It has been forecast (by the industry) that fuel cells for residential and commercial use can become the source of an alternative power supply. Homeowners could thus generate their own power with an appliance in their own house. It is anticipated that first commercial units will have a 40% fuel efficiency, but the overall efficiency could exceed 70% if the excess heat generated is used for hot water and heating.

Decarbonisation

New technologies are being developed for the capture and sequestration of CO₂. These could have a significant impact on our ability to continue to use fossil fuels safely and cleanly and may be a factor in achieving climate change commitments. Therefore, their importance to supply security could be significant.

Different systems are being developed, for example, the decarbonisation of fossil fuels, and storage possibilities are being explored, for example in empty oil fields or suitable geological sites. As with many new technologies, cost is important, and the economic attraction of decarbonisation depends on low oil and gas prices. Other issues, such as environmental and safety implications, require further study.

Clean coal technologies

Fossil fuel use can be made cleaner and more efficient by improving the processes for electricity generation from coal. Various different techniques are currently under development, many with support from the EU. As well as coal, biomass generation could benefit from some of these developments.

These technologies, each of which is at a different stage of development, include the following:

- Advanced pulverised coal-fired boilers (PCF)
- Atmospheric fluidised-bed combustion (AFBC)
- Pressurised fluidised-bed combustion (PFBC)
- Integrated gasification combined-cycle systems (IGCC)
- Pressurised pulverised coal combustion (PPCC)
- Integrated gasification fuel cell systems (IGFC)
- Magneto-hydrodynamic electricity generation (MHD).

The attractions of these are the increased efficiency with which they can generate electricity (by up to 50%), the reduction of harmful emissions from generating processes and the combination, in some instances, of fossil and non-fossil fuels for generating purposes. All of these advantages make coal more attractive as a fuel for electricity generation, and thus are of relevance to the security supply debate. Furthermore, these technologies could open up new markets for European industry in other parts of the world.

Gas to Liquids

One of the problems facing long term gas supply identified above was the elevated cost of transport from distant fields. Gas to liquids technology has the potential to reduce costs of

transport over long distances by converting natural gas into synthetic crude (a middle distillate fuel).

The technology is based on the Fischer Tropsch process, which has for a long time enabled synthetic oil to be produced from coal. The new process adds oxygen to natural gas, thus producing synthetic gas. The resulting crude can be transported via existing oil pipeline and is particularly attractive for diesel applications. It has the advantage over conventional diesel of far lower emissions. Several major oil companies are currently involved in developing the technology.

Nuclear fission developments

Current technological developments relating to reactors concentrate on the simplification of systems and introduction of passive measures, under acceptable conditions of economic viability. Efforts to increase the reliability and safety of generators and to reduce the production cost concentrate primarily on water reactors.

These concepts use advances in well tested conventional technologies with the objective of reducing the probability of a major accident. Several designs accept MOX fuel (EPR, system80+). Passive features are incorporated to varying degrees in many evolutionary and innovative systems. Passive systems do not need active controls or operator intervention in emergency situations; for example thermal convection and gravity are used for several major safety systems such as residual heat removal and containment cooling.

Fast Neutron Reactors (FNR)

Fast breeder reactors make it possible to extract 50 to 60 times more of energy from uranium than with thermal reactors. Under these conditions, current uranium reserves could last for several thousand years. Although development of sodium cooled reactors reached an advanced stage in the EU, the use of this type of reactor has been stopped, in Europe and the USA, except for Phoenix in France, which is running an RTD programme on transmutation of nuclear waste. Other choices of materials and design could make it possible to reconsider sodium cooling. Other cooling media deserve to be reconsidered, for example other molten metals, such as lead, molten salts or gas. In particular there is a renewed interest in gas cooled fast reactors (CO₂ or helium) as the emphasis moves from liquid-metal cooled systems towards in-service inspection, improved core safety and elimination of liquid-metal coolant chemical hazards. In addition fast breeder reactors could make it possible to use the thorium cycle of which resources are 10 times more abundant than those of uranium.

High Temperature Reactors

The development of helium turbines better adapted to the HTGR (high-temperature gas reactors) revived interest in high temperature reactors. They can reach a higher efficiency and are appropriate for uses in industrial processes requiring high temperatures. The designs for this concept are characterised by an increase in the efficiency of the system (about 50%) due to the higher operating temperature and improved fission products retention in the ceramic fuel. Other features include inherent safety, lower quantity of high-level wastes, an easier operation and the potential for the contribution to absorbing Plutonium stocks.

Accelerator Driven Systems (ADS)

Currently ADS is primarily interesting for its potential application for the transformation of waste. At a later date its use for electricity production could be envisaged. There is a wide

range of parameters and designs depending on the neutron energy spectrum, type of fuel (solid or liquid), coolant/moderator type and objectives (energy production, transmutation of actinides). Finally, the Thorium cycle, which produces no plutonium and less radiotoxic waste than conventional cycles, is considered as a long term option to simplify long-term waste management.

Thermonuclear fusion

Subject to technical breakthroughs, nuclear fusion could, in the very long term (at least over 50 years from now), become an inexhaustible source of energy and reduce considerably the problem of nuclear waste. These long-term prospects have prompted research and development efforts on a European and world scale. They are particularly interesting in the context of stabilising and reducing the production of CO₂ from energy production.

Research on fusion is however still to a large extent basic research. Important progress has been achieved during recent years. Numerous scientific questions as well as technological problems will have to be solved before commercial practice could be envisaged. Developments in this field are long and expensive (especially the developments of materials) and require world collaboration between the most industrialised countries. An intermediate stage could consist in the development of a hybrid fusion-fission generator. Such a prototype could be constructed in the shorter term. This approach would also make it possible to develop gradually the technologies necessary for pure fusion. It is also important to stress that the availability of fusion as an energy resource could be limited (while awaiting the use of more fusion reactions than the D-T reaction) by the Lithium and Beryllium resources for the generation of Tritium.

2.3.1.5.4 Potentialities for energy savings

Significant potentialities exist in Europe to curb down energy demand. After examining where energy consumption can be reduced, the issue of how to proceed in order to achieve this objective is a crucial one.

Possibilities for curbing down energy demand exist in the following fields:

- Development of a new generation of vehicles. New technological developments should improve the fuel efficiency of conventional vehicles and should progress towards more efficient electric and hybrid vehicles as well as towards the commercialisation of fuel cell-driven vehicles. Although measures aiming at fuel substitution will not necessarily lead to the reduction of energy demand, they will at least reduce demand in the most sensitive sector (oil).
- Increase of energy efficiency in industrial plants, especially the most energy-intensive ones. There is still considerable potential for additional cost-effective improvement. It must also be considered that the structural evolution of the economy works in favour of light and high-tech industries which are far less energy demanding than former heavy industries.
- Rebalancing of transport modes. The energy efficiency of railways and maritime transport is higher than that of road transport. Present trends showing significantly stronger increase of the road transport mode are highly counterproductive in terms of energy demand.
- Reducing energy consumption in buildings. Greater use of available and economically viable energy-efficient technologies should reduce the use of energy in buildings by at least

one fifth (which is 40 million tons oil equivalent per year in the EU-15). This is equivalent to around 10% of current net oil and oil products imports. Energy saving's potential in the new member countries is probably much higher, because of the higher average age of the building stock and of the lower concern about energy saving in past decades, in particular under the former communist regimes.

How to achieve the reduction of energy demand will depend upon the level of energy price on the market as well as upon the combination of a number of policy measures. If energy prices on the market significantly increase, economic actors and households will automatically be inclined to realise energy savings. In addition to this, various types of policy measures can be applied, such as additional energy taxes (for instance on fuels), the promotion of energy saving schemes, the dissemination of new technologies, the distribution of incentives for building insulation and for the use of renewable energy sources etc.

2.3.1.6 Horizontal energy issues

2.3.1.6.1 *Energy and economy*

Energy prices have a direct and indirect effect on economic performance, and, based on previous trends, economic performance and energy consumption are often related. Any significant change to energy prices has wider economic implications since energy is a major component of industrial production costs in all sectors as well as domestic running costs.

The price of oil has come to be seen as a determinant of economic performance. Despite decreases in energy intensity and improved energy diversity in industry and heating, the price of oil remains, directly and indirectly, an important component of economic costs. This situation is worse than 30 years ago because of the massive growth in the transport sector, which depends almost exclusively on oil. In the 1970s and 1980s the worst economic recessions after the Second World War were caused by the oil shocks, and it was not until the second half of the 80s that the macroeconomic consequences (inflation, third world debt, unemployment) were brought under control. The rises in oil prices are directly fuelling inflation in Europe, pushing interest rates up. The inevitable consequences for employment, investment and enterprise are likely to become apparent gradually.

A close correlation has been observed between oil prices and unemployment. Although unemployment is a lagging indicator, it generally rises as a result of higher inflation. The links between oil prices and unemployment becomes apparent when the higher inflation is triggered by higher oil prices as was the case in the 70s and is starting to happen now. Low oil prices have benefited economic cycles, but there is a new concern that oil price rises will over time slow down the world economy.

Increasing dependence on imports brings increasing exposure to price fluctuations, most of which are outside of Europe's control. This has implications for Europe's economy and employment market and is a key issue for energy supply policy. A reduction of external dependence on oil would be attractive for economic and energy supply reasons, but it is unrealistic. This highlights the importance of improving diversity of supply and diverting demand away from oil.

2.3.1.6.2 Energy and the environment

Energy production, transportation and consumption are significant sources of environmental problems. Although different types of environmental pressures are generated by energy systems, the most significant one is related to the production of greenhouse gases, and in particular CO₂, a main factor responsible for climate change.

As far as the EU (15) is concerned, some 94 % of man-made CO₂ emissions in Europe are attributable to the energy sector as a whole. In absolute terms, oil consumption on its own accounts for 50 % of CO₂ emissions in the European Union, natural gas for 22 % and coal for 28 %. In terms of consumer sectors, electricity generation and steam raising are responsible for 37 % of CO₂ emissions, transport for 28 %, households for 14 %, industry for 16 % and the services sector for 5 %. Some 90 % of the projected growth in CO₂ emissions will be from the transport sector.

The campaign against climate change led to agreement on a package of objectives at the Earth Summit held in Rio in 1992 under the auspices of the United Nations. The resultant convention was followed by a protocol signed in Kyoto in 1997 containing more detailed commitments which are more binding on the industrialised countries. Even if the impact of the EU, with 14 % of the world CO₂ emissions, remains limited, the EU has to set an example in this field by implementing a strong policy aimed at significantly reducing the production of these gases. The European Union has given an initial commitment to stabilise its CO₂ emissions at 1990 levels in 2000 and then to reduce its overall greenhouse gas emissions over the period from 2008 to 2012 by 8 % compared with 1990 levels, equivalent to a 346 million tonne reduction in CO₂. Under a burden-sharing agreement concluded within the European Union, Germany is committed to a 21 % cut and the United Kingdom to 12.5 %, while France and Finland must stabilise their emissions.

Since 1990 greenhouse gas emissions have continued to rise relentlessly in most industrialised countries. Europe has succeeded in stabilising its CO₂ emissions in 2000 at the 1990 level. However, this has been due largely to cyclical factors such as the economic slowdown in the wake of the 1991 Gulf crisis, combined with industrial restructuring in the United Kingdom and the new German Länder.

Although transport accounts for only 28 % of total CO₂ emissions, it will be the main reason for the European Union failing to meet the commitments given at Kyoto unless radical changes are made rapidly. According to the last estimates, if nothing is undertaken to reverse the growth trend, CO₂ emissions due to transport would increase by approximately 50 % between 1990 and 2010 reaching 1 113 million tonnes of emissions, compared with 739 million in 1990. Once again, road transport is the principal cause as it alone accounts for 84 % of CO₂ emissions ascribable to transport. Air transport represents 13 %. The fact that an average lorry generates six times more CO₂ per tonne/km than a train puts into perspective the full significance of Community action to rebalance the modal split.

2.3.1.6.3 Territorial dimensions of energy issues

a) Territorial disparities in energy supply, prices and economic impacts

Regional availability of fossil resources

The availability of fossil energy resources (mainly coal and lignite) has played an important part in the past in the industrialisation and economic development of numerous regions in

Europe (Midlands, Ruhr, Saarland, Asturias, Silesia etc.). Nowadays, coal has been offset by other fossil energy sources (oil and gas) in industrial development. Regions bordering the North Sea are favoured in this respect.

Regional availability of renewable energy

The availability of renewable energy is mainly related to:

- Geographical factors:
 - Climate (latitude=sunshine; coastal versus continental locations)
 - Geomorphology (presence of mountains favourable for hydro-electricity)
 - Coastal and other windy areas (wind energy)
- Presence of appropriate rural areas (biomass and bioenergy)

National and regional differences in energy prices

There are very important differences of energy prices between countries and between energy sources. The 2001 average EU electricity prices for industry were € 5.48 per 100 kWh and the average natural gas prices were € 5.62 per GJ. Differences between countries were in the order of € 2.42 (SE) to € 8.54 (I) in the case of electricity and in the order of € 3.55 (UK) and € 8.42 (SE) in natural gas. Market liberalization and European energy networks integration will have significant impacts in prices and different impacts on the competitiveness of economic activities in each territory. Such impacts will be stronger in territories with a more energy-intensive economy.

Regional access to energy

While a number of European regions are particularly favoured in terms of access to energy (those bordering the North Sea, those with important renewable energy potential), certain European regions do not have access to gas resources.

Regional differences in economic impacts of energy

Regions that 'export' energy may have in this activity an important source of income, although in most cases, mainly in cases of hydro-electricity or wind or solar energy, the revenue for producing regions may be extremely weak in as much as these facilities are owned by non residents in the region. In some cases the economic advantages for these regions are limited to some kind of 'redevance' paid to territorial communities for the use of natural resources. In some regions, renewable energy generates a significant number of jobs.

There is no clear relation between energy self – sufficiency and development. European countries were able to answer their energy needs through energy imports: no statistical relation exists between energetic self-sufficiency and GDP per capita. This result seems to hold at regional level where it seems there to be a non-coincidence between energy production and energy consumption.

Investments in the energy sector positively affect the regional economy.

Regional income transfers take place through fiscal redistribution.

b) Territorial disparities in energy consumption and intensity

Disparities between the EU-15 and the new member countries

Large disparities exist on energy consumption and intensity between European countries with a major contrast between EU 15 countries (0.13 toe per 1000 € of GDP) and Candidate Countries (0.44 toe per 1000 € of GDP). Economic development has associated a decrease in energy intensity: increasing energy efficiency is embedded in economic development and, if we exclude some extreme country situations, in Europe it seems to be an inverse relation between development levels and the intensity of economic uses of energy.

Importance of climatic factors

Regions with more favourable climatic conditions (southern regions, coastal regions) are less energy consuming than northern mountainous or continental regions.

Degree of urbanisation

Highly urbanised regions have stronger tertiary and manufacturing activities, higher mobility, lower rates of use of renewable energy than rural areas.

Regional economic dependence upon long-distance transportation

The economy of peripheral regions is more dependent on long-distance transportation than that of more central regions. Peripherality is therefore a factor of increased energy consumption. Peripheral regions are therefore particularly affected by the increase of energy price, and in particular of oil price.

Energy consumption patterns and regional quality of life

Energy has a strong potential to become an important factor of life cost and of quality of life and a determinant of residential and urban location choices. Namely, energy can be a decisive factor of mobility choices and impact strongly in urban form and in the use of urban space.

2.3.1.7 Main elements of EU energy policy

The objectives of the EU energy policy are:

- to ensure security of the energy supply through managing the growing external dependence of the Union in this sector;
- to facilitate closer integration of the Community energy markets, so as to improve the competitiveness of European industry, without in any way neglecting the safety, quality and durability of energy equipment, or public service objectives;
- to implement an energy policy compatible with sustainable development objectives, particularly through more rational use of energy and the development of renewable sources;
- to promote research and technological development in the energy sector.

Community actions undertaken with a view to ensuring security of supply comprise:

- actions aimed at diversifying energy sources, through the development of relations with supplier countries and research on alternative energy sources (programme ALTENER). Renewables and distributed generation are energy supply technologies that are expected to have a high contribution to local development, by promoting endogenous resources and creating opportunities for new economic activities. The White Paper 'Renewable energy: White Paper laying down a Community strategy and action plan' has as objective to attain, by 2010, a minimum penetration of 12% of renewable energy sources in the European Union. A Directive on the 'Promotion of production of electricity from renewable energy sources' (Directive 2001/77/EC) confirmed the target of 12% of renewables in the EU energy systems while fixing a target of 22,1% of electricity produced from renewable sources.
- actions on energy demand, aimed at promoting the rational use of energy (programme SAVE);
- aid and co-operation programmes, both through technical assistance programmes (PHARE, TACIS, MEDA) and specific programmes such as '[Intelligent Energy for Europe](#)', and also through external aspects of research and environment policies.
- inclusion of an energy dimension in the pre-accession strategy of the CEECs;
- co-operation with international organisations;
- adoption of crisis measures.

Regarding the integration of energy markets, main initiatives taken in this sector are in particular the directives aimed at a progressive liberalisation of the [electricity](#) and [gas](#) markets (Council Directive 90/547/EEC of 29 October 1990 and Council Directive 91/296/EEC of 31 May 1991). Energy investments may be financially supported by the Structural Funds or through the trans-European networks. The Council Decision 96/391/EC of 28 March 1996 lays down a series of measures aimed at creating a more favourable context for the development of trans-European networks in the energy sector, thus creating the conditions for the development of co-operation projects within regions in different continents (mainly Europe, Africa and Asia). In this context some 74 projects of common interest have been identified. The European Investment Bank, the European Investment Fund, ECSC and EURATOM also provide financial support in this sector.

On the promotion of sustainable development, EU policies contain provisions to ensure the compatibility of energy-related and environmental objectives, the rational and efficient use of energy resources, the promotion of new and renewable energy sources and consistency between the different programmes.

Finally, support is being given to technological [research](#) and development, both in the areas of nuclear and non-nuclear energy.

2.3.1.8 Summary of trends and driving forces

The main driving force leading to a sharp increase in world energy prices is the emergence of a strong imbalance between energy supply and demand at world scale. This imbalance is caused by the cumulative impact of various factors:

On the demand side:

- the main factor of increase is the strong economic development of large emerging industrial countries, such as China, India, Brazil etc. Smaller industrialising countries also contribute to increasing energy demand. Insufficient energy savings in large industrialised countries (USA in particular) work in the same direction. Presently, global daily oil demand is at around 78 million b/d and is growing at 2.25% per year, which is far above the annual 1.4% which prevailed during the 1988-2002 period.
- demand for conventional primary energy sources is rising (oil and gas in particular). In the EU, this means an increase in imported energy and therefore an increase in external dependency as well as a greater exposure to the globalisation of the energy markets (competition with other large energy importers);
- in the EU, the transport and tertiary sectors are largely responsible for the increase in energy demand. The EU enlargement is likely to generate more intense transport flows and therefore higher energy demand.

On the supply side:

- in the short/medium term, the main factors of restriction are war and terrorism (Middle East, Nigeria), the policy of production monopolies (OPEC), economic troubles (Russia) etc.
- in the longer term (after the mid 2010s) oil production is likely to peak for technical reasons and to cause a disastrous disruption between oil supply and demand.
- in the EU, the contribution of renewable energy is still very modest (6% in total, out of which 4% originate from hydro-electricity). Prospects for a significantly stronger contribution of renewables in the coming decade are not encouraging, mainly because of the amount of investments necessary. The strong increase in oil price could however boost new investments in renewables;
- new technologies are presently being developed in the field of energy production, but they will generally need considerable time to become mature and operational (nuclear fusion for instance). Hydrogen is an energy vector and not a source of primary energy. Significant amounts of electricity are necessary to produce hydrogen.
- within the EU, energy market opening has associated a decrease in energy prices either for households or for industry. Most of the EU energy policy measures will impact territorial development through energy prices variation.

A logical consequence of increasing imbalance between energy supply and demand is the increase of energy price. This is already obvious in the oil sector. Gas prices, which are indexed on oil prices, are progressively following the trend. Through substitution effects, other energy sources are also likely to become more expensive.

2.3.2 Prospective thematic energy scenario: 'Europe in a context of high energy prices'

2.3.2.1 Scenario hypotheses

The main hypothesis is that energy prices will be substantially higher in the coming decades than they were in the past decades. Secondly, in the medium- range, the production of oil at world scale will peak because of geological reasons. This will be followed by a period of strong imbalance between demand and supply of oil products and even of scarcity of oil products. A basic hypothesis is also that the emerging imbalance between energy supply and demand will take place in a context where renewable energy sources will only cover a modest part of needs and new technologies making the production of large energy quantities will not have emerged. The present scenario assumes that the oil price will more or less regularly, but substantially increase up to the mid 2010s. After oil production peaking, oil price will jump to extremely high levels and scarcity will be the rule. The prices of other primary energy sources will also increase in the context of substitution processes.

2.3.2.2 Driving forces

The main driving force leading to a sharp increase in world energy prices is the emergence of a strong imbalance between energy supply and demand. This imbalance is caused by the cumulative impact of various factors:

- on the demand side, the main factor of increase is the strong economic development of large emerging industrial countries, such as China, India, Brazil etc. Smaller industrialising countries also contribute to increasing energy demand. Insufficient energy savings in large industrialised countries (USA in particular) work in the same direction. Presently, global daily oil demand is at around 78 million b/d and is growing at 2.25% per year, which is far above the annual 1.4% which prevailed during the 1988-2002 period.
- on the supply side, in the short/medium term, the main factors of restriction are war and terrorism (Middle East, Nigeria), the policy of production monopolies (OPEC), economic troubles (Russia) etc. In the longer term (after the mid 2010s) oil production is likely to peak for technical reasons and to cause a disastrous disruption between oil supply and demand.

With increasing integration in energy supply, world energy process will be more and more dependent upon the price level of the most volatile price factor: oil prices. The hypothesis of this scenario in terms of world energy prices largely differs from the hypotheses of existing scenarios in this field (European Commission, American DOE, World Energy council, OECD etc.). In such scenarios, the worst hypothesis envisaged for oil price is generally \$40 per barrel (and only for short periods), while the real price level had already reached 55 \$/barrel in 2004.

2.3.2.3 Medium-term evolution (until 2015)

2.3.2.3.1 *Energy price becomes a strategic factor*

In the early 2000s, the price of crude oil had been regularly increasing. Up to the beginning of the war in Iraq in 2003, oil price increase had not been considered as a serious issue. On the contrary, it was the price level of the year 1999 which was considered as unusually low. The price level in early 2003 (around \$25/barrel) looked more normal. During the second half of the 1990s, Europe did not draw significant benefits from the low price level of crude oil because the exchange rate between the European currencies and the USD (crude oil is paid in USD) was unfavourable.

In the early 2000s, the low growth rate of the European economy resulted less from the increase of oil price (which was compensated by the strengthening of the Euro in relation to the USD) than from the fact that precisely the re-valuation of the Euro became a constraint for exports from the Euroland. The sharp increase in crude oil price, which started by mid-2003 to reach a first culmination at \$55/barrel one year later was taken seriously by economic operators for the first time since the oil shocks of the 1970s. Although Europe's economy was apparently in a better position than in the 1970s to absorb oil shocks (the energy intensity has significantly declined since the mid-1970s and the Euro has been regularly progressing in relation to the USD), growth rates of the economy remained low when compared to those of the USA and in particular of China and other emerging economies. Already at the end of 2004 it became clear that the time of cheap energy was over. Too many factors worked in the same direction: war and troubles in the Middle East and elsewhere (West Africa, Venezuela), increasing oil consumption in the Far East (China, India...), OPEC's policy etc.

In the second half of the 2000s, the price of crude oil continued to increase with a number of ups and downs caused by speculation (hedge funds in particular) and other factors (irregular level of oil reserves in industrial countries, seasonal variations of demand etc.). By 2008, the price had reached \$100/barrel and by 2010 \$130. After 2010, the evolution suggested some form of normalisation, although the oil price increase did not really stop. It reached \$150/barrel in real terms in 2015.

By 2015 Europe had been living for a decade with high oil prices and -more generally - with high energy prices. The price of natural gas had followed the same trend as oil price, partly because of automatic price indexation and partly because of a transfer of demand from oil to natural gas. Electricity had also become much more expensive. The development of energy transport infrastructure at EU level, including also better connections with external energy exporting countries and progress in energy-related technologies strongly contributed to the unification of the energy market in Europe and to the increase of substitution possibilities. This, in turn, resulted in widespread price increases among all energy sources.

The macro-economic impacts of this evolution have been significant. The increase of oil and gas price caused a deterioration of the trade balance of the EU, because of higher external energy dependency and higher energy taxes in Europe. Energy-intensive industrial activities became less and less competitive. A number of them were closed down. Others attempted to find a renewed competitiveness through relocation outside Europe. The growth rates of the European economy remained low, although the energy intensity went on diminishing. Economic interactions at global scale added to the pressure on the European economy. Although oil and gas producing countries accumulated enormous profits, these were only partially recycled in the global economy because of political tensions and troubles, in

particular in the Middle East. In addition, the European economy also suffered indirectly from the impacts of high energy price on emerging economies which generally had very energy-intensive production systems and were even more energy-dependent than Europe was. Economic development in these countries became more difficult and European exports towards these countries were significantly affected. A major difference with the energy crises of the 1970s was that, in the new situation, energy demand did not stop growing at world scale, mainly because of the needs of large emerging economies. The imbalance between limited supply possibilities and steadily growing demand had a long-lasting character. In this context, reducing the European dependence on energy imports became an absolute priority. Both energy savings and the development of new energy sources and energy vectors (such as hydrogen) were politically strongly supported. Short-term measures for more efficient energy savings were adopted in various fields. Thermal insulation of buildings was improved, both in the case of dwellings and offices, in order to reduce the costs of heating in winter and of cooling in summer. Demand for smaller cars using less fuel increased and public transportation became very popular. More structural strategies were also developed and implemented. These required however significant investments and their impact became really substantial by the year 2010.

Investments in renewable energy sources expanded exponentially after 2005 in a variety of fields. In the housing sector, solar energy was progressively introduced everywhere where benefits could be drawn from the reduction of oil, gas and electricity consumption. More and more hot water was produced by solar thermal equipments, the use of which became rather widespread. The development of technologies in this field made solar thermal techniques attractive, even in regions with unfavourable climatic conditions. The profitability of photovoltaic techniques remained less attractive as long as the price of electricity was reasonable. The liberalisation of the electricity market was completed in the EU in the late 2000s and growing electricity demand brought with it strong price increase by 2010. It became then quite profitable for households to derive part of their own electricity consumption from photovoltaic sources.

Windmill parks were built, particularly in coastal and hilly landscapes. A number of conflicts arose with environmentalists who were in favour of paying greater attention to the protection of landscapes. New generations of windmills were developed with less environmental impacts, in particular as far as noise is concerned.

Biofuels became quite popular. The strong increase of oil price made them rapidly profitable. Remembering that Rudolf Diesel had demonstrated his invention at the World Show in 1900 in fuelling his engine with peanut oil, the promoters of biofuels started using plant oil, crop wastes and wood to run cars, buses and lorries. The amount of transport fuel coming from crops increased significantly, but has been constrained by the considerable size of agricultural areas necessary to produce reasonable amounts of biofuels. In the case of rape, an hectare of arable land cannot produce more than 1.45 tonnes of biofuels per year. A real competition started between those who wished to use arable land for fuel production and those who fought to maintain sufficient food production in agricultural areas. Environmental risks generated by intensive rape production were considered as serious enough to limit its territorial expansion. The EU target of having by 2010 6% of transport fuel originating from crops could hardly be reached for that reason.

Biofuels for transportation purposes have not been the only use of biomass in the energy sector. New technologies made also possible a more widespread use of wood and methane gas for heating, in particular in rural areas.

Geothermal energy was also more seriously developed. Its use has however been limited to specific locations where the underground has the properties required. In those places, efficient district heating systems could be developed.

In addition to renewable energy sources, new technologies made possible the use of new energy vectors such as hydrogen. After a period of intense R&D and experimentation activities, hydrogen-powered engines (fuel cells) became more and more used from 2010 onwards. The main problem which had to be solved was the creation of a network of hydrogen supply stations. The production of hydrogen requires however considerable amounts of electricity. As electricity demand had already significantly increased as a substitute to other energy sources, the price of electricity had also reached high levels. This became a major constraint to the generalisation of the use of hydrogen as energy vector.

The strong increase in electricity demand brought with it a passionate debate on the future of nuclear energy. Although largely rejected by the European population in the early 2000s, the expansion of the production of nuclear electricity found progressively more and more supporters in the late 2000s, in particular when new generations of nuclear power plants appeared (using MOX fuel or high temperature technologies). Because of the political sensitiveness of this issue, only a limited number of new nuclear power plants were built. The complexity of such projects was the main reason why they did not become operational before 2015. Phasing out strategies remained limited to a small number of countries which had to import more and more electricity from their neighbours. The increasing obsolescence of a large number of power plants became then a serious issue, not only in the new member countries of Central and Eastern Europe, but also in the EU-15. By 2015, a number of decisions were pending in this field, but could not really be taken because of political resistance.

Simultaneously, R&D and experimentation efforts had also been concentrated on emerging technologies such as clean coal technologies (including gasification) and nuclear fusion. Most of these technologies are however promising only in the long term (in particular nuclear fusion which is still at the stage of basic research and will necessitate several decades of coordinated world wide efforts to be utilised as a significant source of energy). In the case of clean coal technologies, in addition to R&D efforts, the volume of necessary investments was responsible for the fact that these technologies could not become operational at a significant scale before 2015. The high level of investment costs involved was also a constraint for their competitiveness.

The use of traditional fossil energy sources, in particular coal, has not been abandoned. Coal production in the enlarged EU was re-activated there where the mines had not yet been closed and where conditions for exploitation were technically and economically acceptable. This was the case in a number of countries of Central and Eastern Europe as well as in the UK. In addition, larger quantities of coal were imported. Coal was mainly used to fuel conventional power plants and, to a lesser extent, for heating. New technologies made possible the reduction of emissions. More and more combined heat-power plants (CHP), fuelled with oil, gas or coal were also built, because of their high energy-efficiency compared with traditional plants.

During the whole period up to 2015, the definition and implementation of new strategies in the energy sector has been confronted with controversial environmental issues. On the one hand, the reduction of oil and gas consumption, the reduction of the energy intensity of the economy, the development of renewables and of biofuels (which do not reject through combustion more CO₂ than the crops have absorbed from the atmosphere) and even the development of nuclear electricity were in line with the Kyoto Agreement and contributed to the reduction of emissions of greenhouse gas. On the other hand, a number of aspects in the new energy strategies have been a source of concern and even of serious tensions within the European society: the development of wind energy with its impacts on landscapes, the development of biofuels in relation to its competition with food production, the revival of coal use in energy production in relation to emissions and in particular the

strengthening of nuclear energy production in relation to long-term aspects of human health and security.

Not only in Europe has the situation of energy supply generated impacts and tensions in the field of the environment. The fast-rising price of oil and natural gas has created a tidal wave of new power plants fired by coal. By the end of 2004, China was on track to add 560 coal-fired plants, India 210 and the USA 72. Altogether, those three nations were to add 325 000 megawatts by 2015, burning about 900 million extra tons of coal each year, in turn emitting 2.5 billion tons of CO₂ into the atmosphere. By doing this, China and the USA took advantage of their huge coal reserves (equivalent to 250 years of supply in the case of the USA). In addition, approximately 60 other nations (the most important in this respect being Malaysia, Japan, Indonesia, Thailand, Turkey) have been developing in the same period another 350 coal-fired power plants. Needless to say that there was no chance to reach the norms of the Kyoto Agreement. On the contrary, in terms of global CO₂ emissions, the situation in 2015 has strongly worsened when compared with that prevailing in the early 2005. The emergence of clean-coal technology was not rapid enough to prevent the worsening of the environmental situation.

2.3.2.3.2 Regional and territorial impacts of high energy prices

The regional and territorial impacts of high energy prices have been quite noticeable after 2005 and became substantial after 2010. The nature of such impacts varied however according to the territorial scale considered.

At European scale, peripheral regions the economy of which was strongly dependent upon transportation, were losing competitiveness because no major substitution possibilities to road transportation were possible. Because of higher fuel price, EU and national policies maintained road pricing at a modest level. In some countries, the level of pricing was variable, according to the regions: it was higher in central and urbanised regions and lower in more peripheral and rural regions. Taxes on fuels were however not reduced, because of their income effect on national budgets.

The share of transport costs in the final cost of products originating from peripheral regions increased as did the final price of these products. This explains their loss of competitiveness. Most affected regions were those of Ireland, Scotland, the Iberian Peninsula, southern Italy, Greece, the northern periphery, as well as a number of peripheral regions of Central and Eastern Europe. Not only freight transport costs were affected by the increase of energy price, but also the costs of passenger transportation. Once again, peripheral regions were most negatively affected because of their higher dependency upon car and air transportation. Low-cost air transport could not be maintained over years and airfares progressively increased again. This trend worked against polycentricity at global European level. The gap between the welfare level of the Pentagon and that of regions outside of it widened. Location preferences were more and more given to regions from where the transport costs to markets and suppliers could be maintained at a reasonable level.

Not only peripheral regions with high transport costs were disadvantaged by increasing energy prices, but also regions with traditional industrial and quite energy-intensive production. Basic activities such as the transformation of raw materials (steel plants, aluminium production) and of intermediate products were particularly affected. A number of plants were closed down, others were re-located outside Europe. Among the regions mainly affected, many belonged to the countries of Central and Eastern Europe. Western Europe

was however not left out of this trend. A number of regions with industrial tradition, both within and outside the Pentagon, also lost activities and jobs.

Climatic factors also played an important part in the territorial impacts of higher energy prices at Europe-wide scale. Mediterranean and, to a lesser extent Atlantic regions, which are known for their mild winters, attracted more and more people, in particular retired ones from numerous European countries, in particular from the Nordic countries, but also from regions with a rather continental climate. Population ageing in Europe favoured this trend.

At intermediate scale (meso level), territorial impacts of high energy price could be observed both in the field of renewable energy and in the settlement structure.

A number of European areas were and still are particularly favoured as far as renewable energy is concerned. These are in particular the Mediterranean – and more generally – the southern European regions in the case of solar energy and the coastal and hilly regions in the case of wind energy and hydroelectricity (tide water turbines). Regarding biomass and the production of biofuels, regions with large and fertile agricultural areas or with wide forests were more favoured than others. More specifically, regions with a humid climate have been more involved in the production of biomass and of biofuels than regions prone to drought. Taking all factors together, the number of European regions with no resources at all, or with modest resources in the field of renewables, is rather limited, but disparities among regions in this specific field are significant. The availability of renewable energy resources has such as climatic factors not been by itself a factor of economic or demographic distinction, but in combination with other factors (economic endowment, quality of life, accessibility etc.), it certainly has been. Migration flows towards regions with attractive climatic conditions or the development of tourist activities in these regions have brought with them wealth and jobs.

Regarding the impact of high energy prices on the regional and interregional dimension of the settlement structure, it could be observed that large and medium-sized towns were preferred to regionally dispersed settlements which are too much dependent – as far as mobility is concerned – from the motor car.

At local scale (micro level), similar trends could also be observed. A clear move away from suburbanisation and towards more compact cities has taken place over the decade. Settlement systems are more and more coupled with public transportation. Urban and housing policies have favoured more energy-efficient types of settlements and buildings, making possible additional energy savings and increased use of renewables. Large recreation areas close to the cities and accessible through public transportation were developed. More retailing shops within and close to housing areas have been opened, making possible purchasing a wide variety of goods without using cars. In place where geothermal resources are available, powerful district heating networks were implemented. Home working has been strongly developing, as well as other types of ICT applications such as the access to public and private services, e-shopping, educational and cultural programmes etc.

By 2015, the components of the European territory have substantially changed, compared with the situation one decade before. In general terms, the European economy had been handicapped by the increase of energy price and growth rates had remained modest. The internal structure of the European economy had however changed significantly. While energy-intensive production sectors had progressively been abandoned, the immaterial economy had strongly progressed and Europe has become the world leader in technologies related to renewable energy and to new energy systems. This compensated for the loss of more traditional activities. Just like after the oil shocks of the 1970s, the European economy had made a 'quantum leap' in qualitative terms. High energy price had worked more

efficiently in favour of the Lisbon Strategy – as far as the structure of the European economy is concerned - than political prophecies and wishful thinking.

Regional disparities had increased, but not following exactly the pattern which prevailed before the increase of energy price. In general, peripheral regions became economically more disfavoured, with the exception of a number of southern – and to a lesser extent Atlantic – regions with good climatic conditions which attracted numerous people (in particular retired ones) and the related services, as well as small footloose companies, mainly of the ICT sector.

A stronger concentration of activities has been observed in the Pentagon which attracted more and more young qualified people from European regions where the economic prospects were less favourable.

A large part of rural areas, where soil and climatic conditions are adequate, were used for the production of biofuels, sometimes at the expense of food production. The landscapes of numerous coastal and hilly areas have been invaded by windmill parks. New conventional and nuclear power plants were built, often coupled with hydrogen production plants.

Settlement systems became again more compact and also more energy-efficient. Not only the building techniques were improved, but also the distribution of urban functions, so as to diminish the need for mobility. Public transportation systems became the real backbone of settlement expansion and restructuration policies. Densification of settlements in coastal regions, in particular Mediterranean ones, became a real problem, adding to the landscape damages caused by tourist development in the 1970s and 1980s and by the development of windmill parks.

The increase of road traffic flows remained more modest than the forecasts of the early 2000s, mainly because of the increase of transportation costs.

2.3.2.4 Long-term evolution (after 2015): Europe after oil production peaking

2.3.2.4.1 Oil peaking becomes reality

Despite considerable investments at world wide scale from 2005 onwards for the exploration and exploitation of new oil resources, global oil production reached a plateau by 2012 and peaked by 2015¹⁹. The steady degradation of the quality of oil produced could be observed in almost all regions having passed the peak and posed additional challenges for the existing downstream infrastructures, in particular refineries.

While the fact that the discoveries of oil peaked in the 1960s has been an accepted knowledge, the fact that the natural gas discoveries peaked in the 1970s has been for a long time a well hidden secret. Already in the 1980s and 1990s, gas consumption was more important than gas discoveries. The peaking of gas production did not occur globally before 2030, but numerous individual large gas fields had peaked earlier. Europe had become strongly dependent upon gas imports and had to face the consequences of very high gas price as well as economic and political tensions on the international gas market.

¹⁹ The year 2015 has not necessarily a predictive character, as uncertainty about the exact date of peaking prevails. Numerous experts agree however on the fact that oil peaking should occur, in probabilistic terms, somewhere between 2010 and 2020. The less optimistic ones even indicate a date for peaking before 2010.

2.3.2.4.2 *Macro-economic impacts*

Real macro-economic impacts were perceived when oil production started to decline substantially and regularly after a period of 'plateauing'. Oil price jumped worldwide to unthinkable levels, soon followed by gas price.

After 2015, oil became a scarce and expensive resource and the whole industrial economy which had prevailed during the 20th century, based on cheap oil, became suddenly obsolete. Impacts were numerous:

- in many sectors, industrial production which used oil not only as an energy source, but also as a raw material for the production of a wide variety of products (plastic materials, synthetic textiles, components for motor-cars, home and office equipments, telecom instruments, chemical and pharmaceutical products etc.) was severely affected. Oil was maintained as raw material only in the production of expensive products with high added-value (pharmaceutical products, electronic components etc.). In other sectors, production had to be deeply re-structured on the basis of both more traditional and very innovative products. The production of alternative basic products (metals such as steel, aluminium, copper etc.) is also dependent upon large quantities of energy. Production costs increased for almost all processed raw materials and basic products.

- in all sectors, production costs increased significantly, generating substantial inflation and affected employment severely. Very high unemployment rates became the rule throughout Europe, generating in the most affected regions, social unrest. Europe entered into long-lasting recession.
- transport costs became so high that 'global' production systems lost their competitiveness, not only in Europe but in most industrialised countries. Production systems were re-organised so as to minimise transport costs, both for intermediate and final products;
- industrial, energy-intensive agriculture became also less and less competitive. Agricultural production had to be re-structured, with less energy consumed by machinery, by the production of chemical fertilizers (ammonia etc.) and by final transportation of food products;
- despite the recessive context, some sectors strongly developed, in particular all those related to alternative energy systems, telecommunication services, new ways of life resulting from the new context, new materials etc.

2.3.2.4.3 *Geopolitical impacts*

International competition for remaining oil and gas reserves grew strongly. In the Middle East, oil and gas exploitation took place more and more under military protection in order to prevent sabotage and other terrorist acts. Most sensitive elements in terms of security were the oil and gas pipelines, as well as ships transporting oil and gas.

Tensions between countries and groups of countries were significant, in particular East-West tensions between the large energy consumers. The terms of numerous long-range bilateral agreements on energy supply, which had been concluded before 2010, could not be respected because of price increase, oil scarcity, international competition and own needs of various oil and gas producing countries. This was particularly the case between the EU and the Russian Federation, and in other cases as well. Speculation, short term interests' coalitions became generalised.

Developing countries and emerging economies were particularly suffering from the scarcity and high price of oil, because their productive systems remained quite energy-intensive. Most of them were too weak to play a serious part in the international competition for oil and gas reserves and, more generally for energy resources, considering the new features of that competition, with its military and strategic aspects. Only those countries with large coal reserves could draw benefits from the situation, using a part of these reserves for their own needs and exporting another part at high price towards the developed world.

In a context of increasing tensions, the EU's strategy was to strengthen and secure its partnerships with its immediate neighbours producing energy, in particular around the Mediterranean (Algeria, Lybia etc.).

2.3.2.5 Regional and territorial impacts

The oil shocks of the 1970s were only modest economic events compared with the new situation. Adjustment processes were no more possible in the short-term. The main consequence was a disruption of the globalisation process.

At European level, the functioning of then Single Market was severely disturbed. Long-distance economic exchanges of goods were decreasing. This affected not only heavy products with low added value, but also a variety of consumer and investment goods (food products, equipment, machinery etc.). Not only intra-EU exchange flows decreased, but also EU's imports and export flows. In addition to the increase of transport costs, the general recession was responsible for this. Europe had to significantly re-organise its economy on a more self-sufficient basis. Relationships between the pentagon and the peripheries became less strategic.

The new paradigm was a re-organisation of production and consumption systems at meso-scale, in order to minimise transport costs. Regional specialisation at European scale lost of its importance. Heterogeneous production systems developed at meso-level. Large urban concentrations became again more dependent upon the surrounding rural areas. A revival of poly-cultural and more labour-intensive agriculture could be observed throughout Europe.

Numerous urban citizens who became unemployed in the context of the general recession, moved towards rural areas in order to develop a more self-sufficient way of life (family agriculture, energy production from biomass, development of endogenous resources etc.). Not only regions with favourable climatic conditions benefited from this trend, but also a number of remote rural areas where agricultural and other activities had previously been more or less abandoned. This contributed also to diversify the demographic structure of these rural areas prone to strong population ageing and to depopulation trends.

In terms of energy production, regions with still exploitable fossil resources (coal, brown coal, peat etc.) were again brought into exploitation. Technologies for using these fossil resources were further developed in order too increase both the environmental protection and the energy-efficiency. The environmental debates which strongly developed before 2015, were attenuated after the oil production peaking by the new situation of energy scarcity. Less resistance was expressed as far as the development of nuclear energy, biofuels and wind energy is concerned. A real conflict of interest emerged however between the production of biofuels and food production, because food production became again a strategic factor. Solar energy systems were very widely developed and implemented throughout Europe. In general, the environmental context worsened in a number of fields (for instance through the intensive use of coal and brown coal, through the proliferation of

wind mills etc.); but it improved in other fields (through the reduction in intensity of traffic flows, through the increased use of public transportation, through the development of solar energy etc.).

Large cities became less and less attractive, because high unemployment generated security problems and social tensions. The most distant suburban areas were abandoned by a large part of the population of working age and were left to retired people with low mobility. Medium-sized and small cities were favoured for a number of reasons, among which the need to reduce expensive daily mobility.

Long-distance mobility for recreational purposes (implying the use of cars or airplanes) had been progressively given up, not only because of transportation costs, but because of the reduction of the purchase power. Stronger pressure on recreation areas more easily accessible from large towns was generally observed.

After more than a decade of chaotic re-structuring and re-organisation in the new context, Europe was, by the year 2030, progressively adapting to new forms of living and working. The organisation of economy and society has radically changed. The territorial image of Europe by the year 2030 was again quite different from what it was in 2015. On the one hand, the economic depression had left serious damages in a number of regions where urban population had partly moved towards other regions and partly moved towards rural areas. On the other hand, the excesses caused by rapid globalisation in the early 2000s have slowed down, limiting congestion in transportation and the de-structuration of productive systems (agriculture, manufacturing industry). Concentration trends within the pentagon had slowed down, and even reversed to the benefit of less urbanised regions and of areas with favourable climatic conditions. A number of remote rural regions were re-populated on a self-sufficiency basis. The organisation of economy and society at meso-scale (regional and interregional areas, including those with a transnational dimension) had progressed. By 2030, Europe was still extremely vulnerable, but it was progressively moving towards more sustainable forms of development which were very different from those envisaged in the 1990s and early 2000s.

2.3.2.6 Main issues resulting from the scenario

The scenario clearly shows two different situations: the period from now on up to the occurrence of the peaking of oil production and the period after oil production peaking. Although the date of peaking cannot be precisely foreseen, because the exact situation of existing oil reserves is not known, various international experts of the oil and gas sector (Campbell, Laherrere, Bakhtiari, Simmons etc.) agree on the fact that the probability of oil peaking occurrence before 2020 is high and that that of gas production peaking will follow with a delay of not more than 15 years.

During the first period (up to the occurrence of oil production peaking), the regular increase of oil price will call for stronger policies in the field of energy savings and development of renewable energy sources. More conventional primary energy sources such as coal will continue to be used and promoted, despite their detrimental environmental impact. A strong political debate will develop about the necessity or not to strengthen nuclear energy production (new generation of nuclear power plants). The increasing territorial imbalances will also have to be addressed by public policies in a context of low economic growth.

The situation following oil peaking will be a completely new one, being very chaotic, with numerous tensions inside and outside Europe. The main objective of the scenario is less to provide a precise description of this situation and its evolution than to raise awareness about

the occurrence of oil peaking (which will anyway happen. The only question is only when?) and about its dramatic impacts.

2.3.2.7 Impacts for EU policies

As far as the first phase is concerned, EU policies in transport, energy, regional development and environment will be primarily addressed (energy savings, promotion of renewable energy sources, environmental constraints, territorial imbalances).

In terms of policy implications, the simple fact that oil peaking will anyway occur should also lead European political authorities to immediately start massive R&D programmes in order to investigate in depth the potential impacts of such a situation and to develop substitution fuels and to promote alternative systems (mobility, transportation, heating, industrial production). Another objective of the scenario is to draw the attention on the relationships existing between the systems of energy supply and the organisation of economy and society in its territorial dimension. Numerous public policies will be addressed by the occurrence of oil production peaking. If one assumes that the strong economic recession and related troubles will have no fatal impact on the existence of EU institutions, EU policies such as Transport, Energy, Environment, Regional Policy, CAP, External Relations etc. will be concerned and will require significant adaptation.

Further EU enlargement processes will be stopped after oil production peaking, because of political and economic tensions resulting from the recession.

2.3.2.8 Indicators

Numerous ESPON core-indicators can be used in the context of the scenario, such as:

- Income per capita; GDP per capita;
- Productivity;
- Net migration rate;
- Unemployment rate;
- Daytime accessibility by transport mode;
- Travel costs by transport mode;
- Impact of accessibility changes on GDP/capita;
- Impact of accessibility changes on unemployment;
- R&D expenditure;
- Electricity production by power source;
- Final energy consumption by energy type and consumption sector;
- Energy prices for industry

2.3.2.9 Main ESPON studies useful for the elaboration of the scenario

Valuable information can be derived mainly from two ESPON studies:

- ESPON study 2.1.1.: Territorial impact of EU Transport and TEN policy;
- ESPON study 2.1.4.: Territorial trends of energy services and networks and territorial impact of EU energy policy.

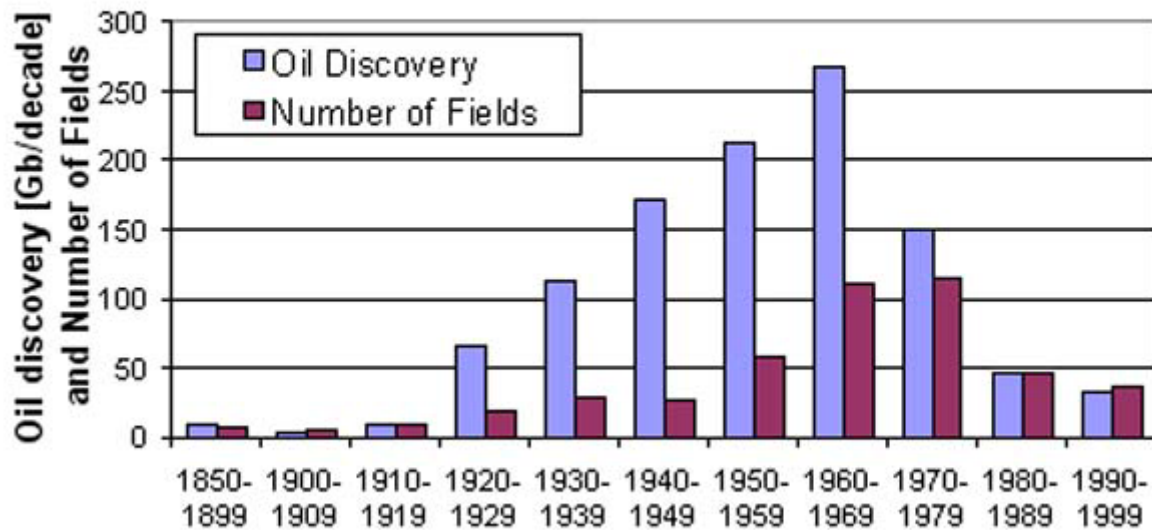
2.3.2.10 Summary

The evolution of energy price (in particular oil) over the past year indicates that there is a significant change in trends and that high energy prices will have in future a sustainable character. The prospective (roll-forward) scenario aims at investigating the macro-economic and territorial impacts of the new trend, taking as assumptions that oil price (and other primary energy sources as well through substitution effects) will continue growing more or less regularly and substantially until the mid 2010s and that oil production at world scale will peak before 2020 (in our scenario around 2015) because of geological constraints, generating a complete disruption of balance between supply and demand of energy. While the first period is characterised by further concentration of population and activities in the Pentagon at the expense of peripheral areas, the second period is much more chaotic. It will be characterised by a reversal in the globalisation process, by the reorganisation of economy and society at meso-scale (regional/interregional), by very high unemployment rates leading to migration towards the rural areas. The scenario illustrates how a single economic factor with strategic character such as energy is likely to lead to dramatic changes in the territorial organisation of Europe.

Appendix 1 : Graphs

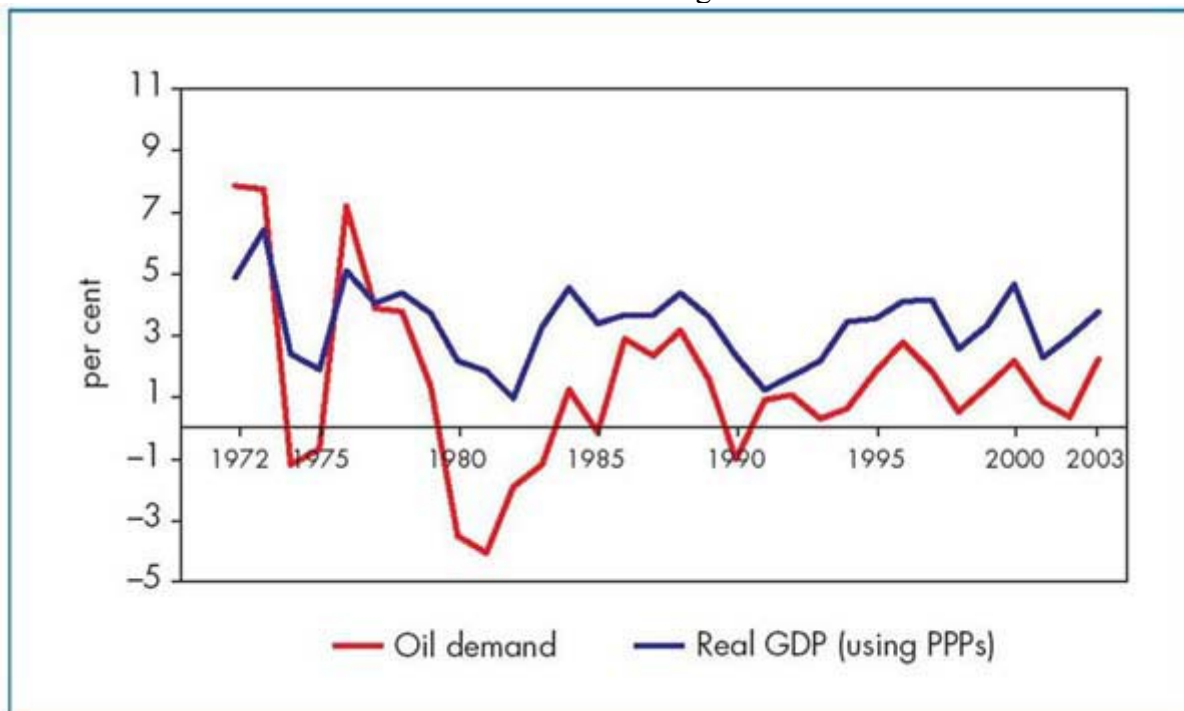
(following graphs are extracted from « International Energy Agency accepts Peak Oil ; an analysis of chapter 3 of the World Energy Outlook 2004 » by Prof. Kjell Aleklett; Uppsala University. Association for the Study of Peak Oil and Gas). 2004.

Giant Oil Field Discovery per Decade

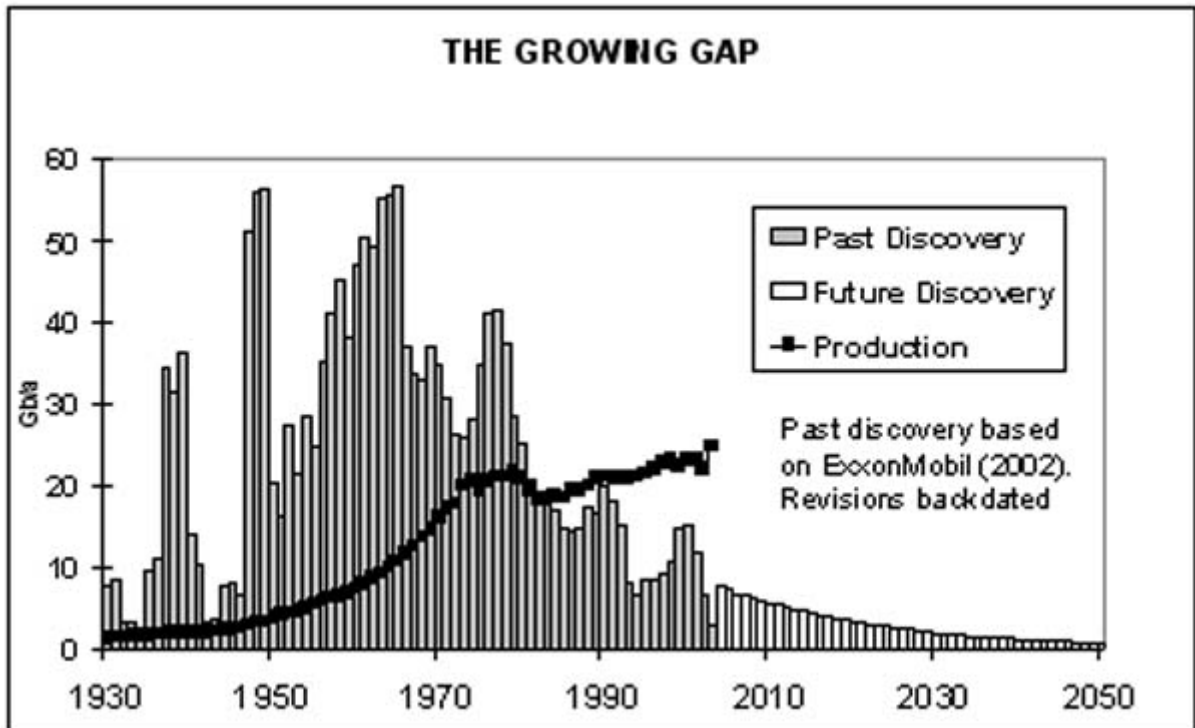


Source : Uppsala University

Oil demand and GDP growth

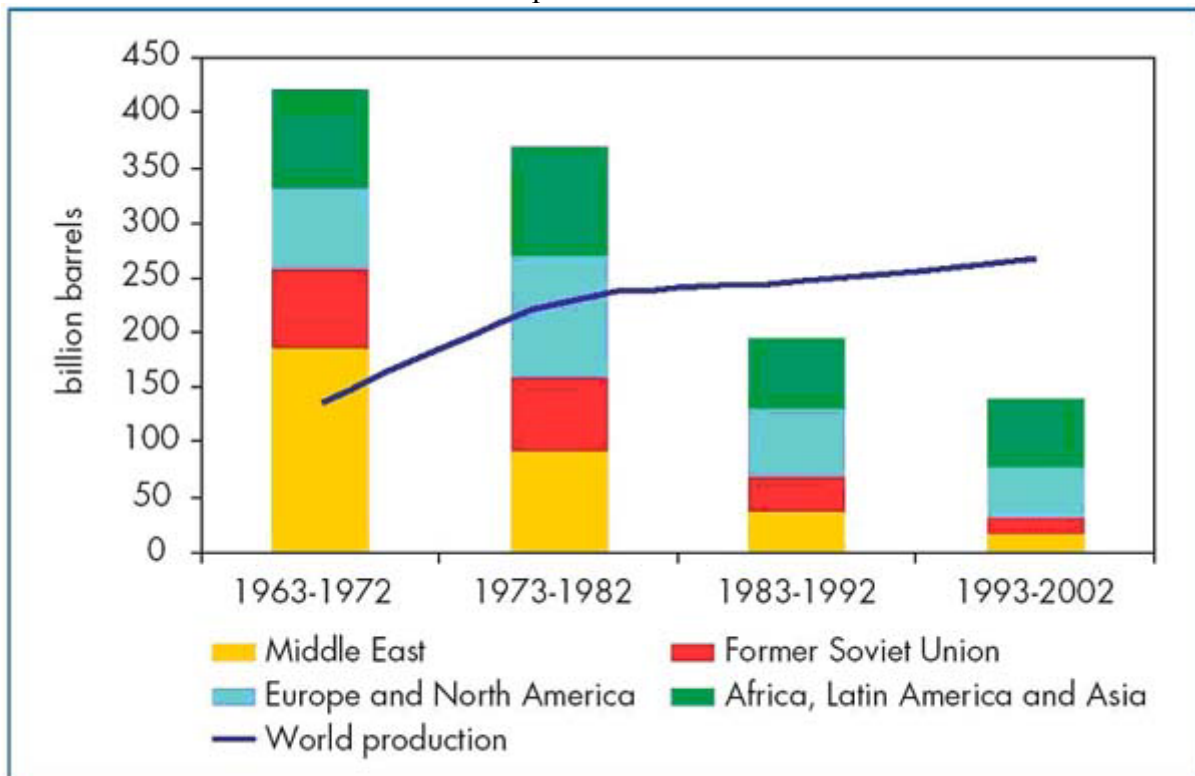


Source : WEO 2004



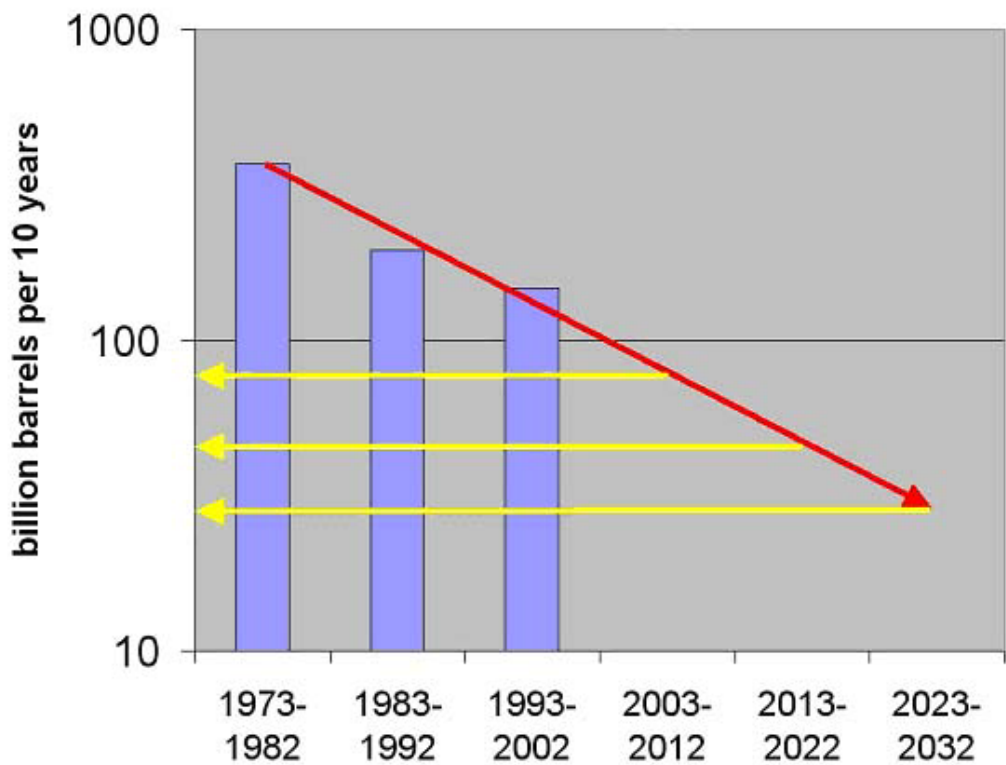
Backdated world discovery of crude oil in comparison with production. Source Uppsala University

Oil discovery and production

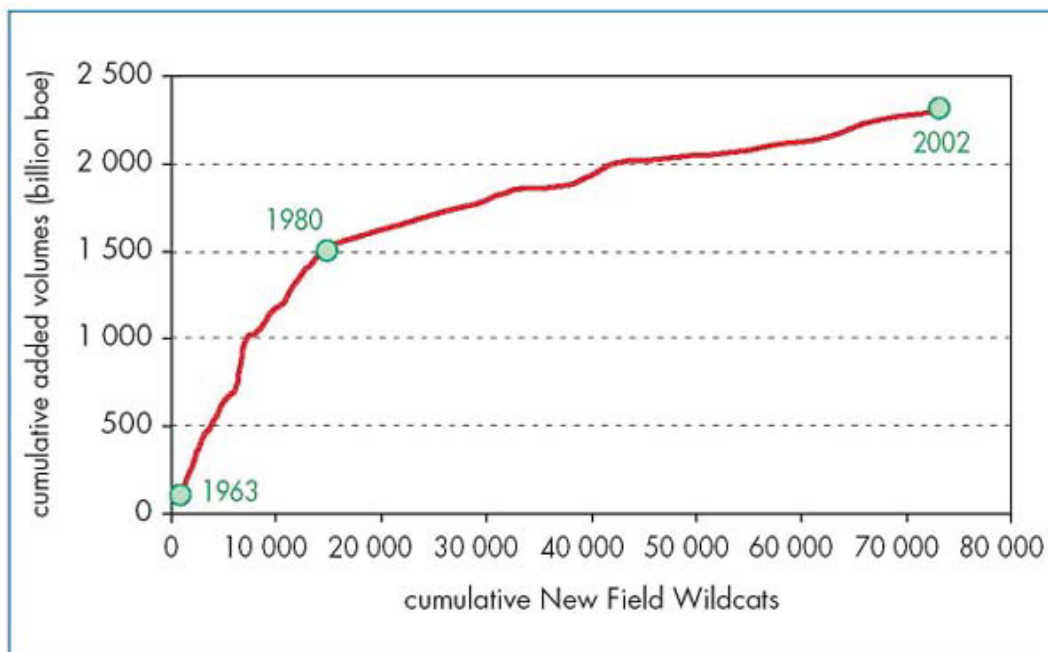


Source : IEA analysis based on IHS Energy database.

Addition to World Proven Oil Reserves from the Discovery of New Fields and Production

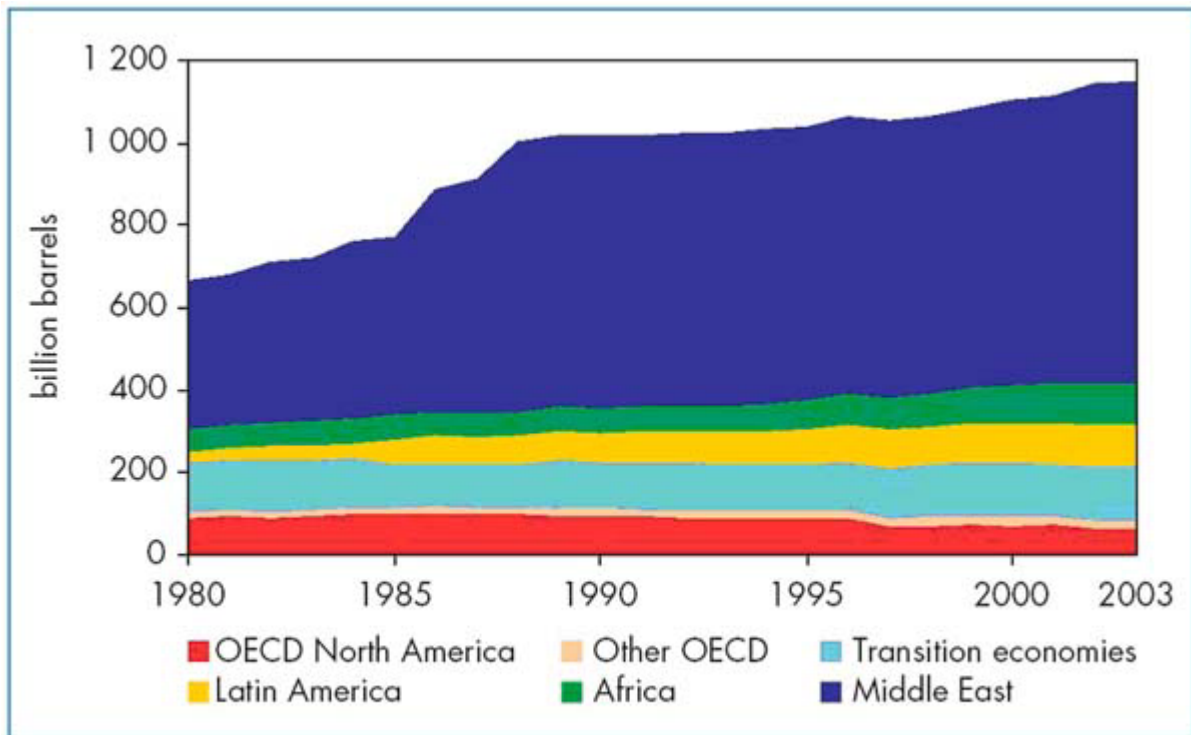


Extrapolation of discovery of new fields for the next 30 years.



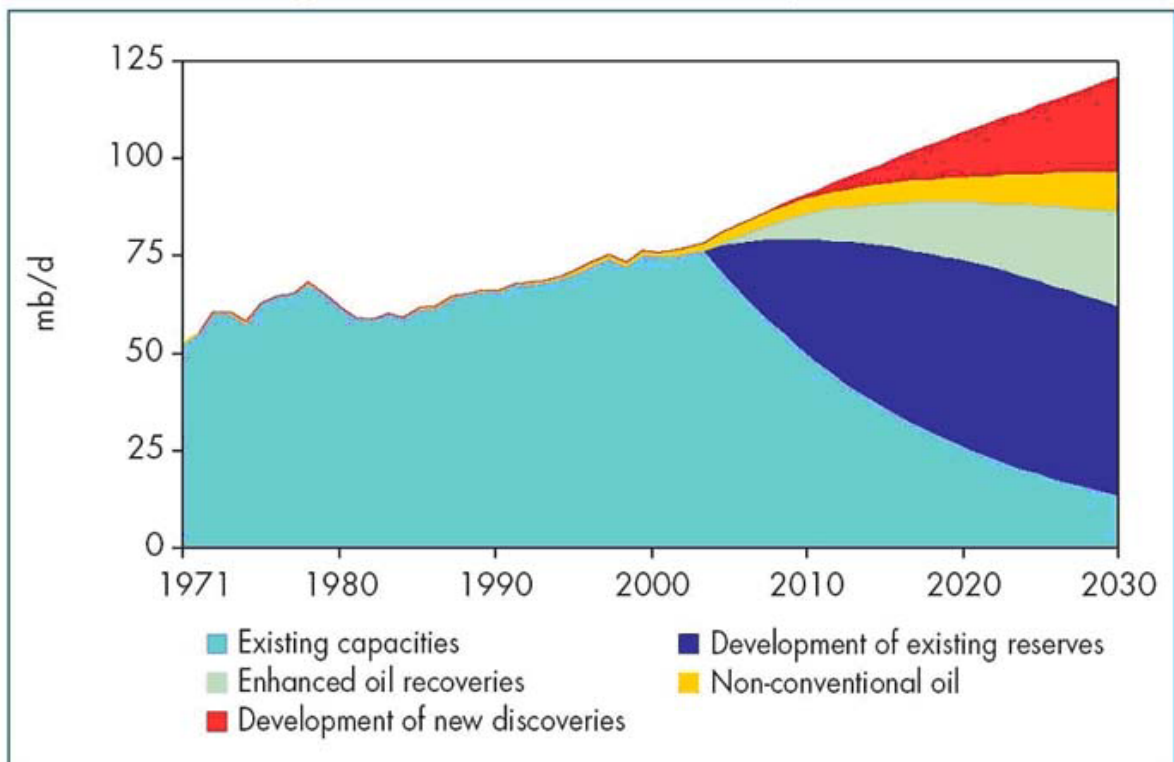
Source: IEA analysis based on IHS Energy database.

Cumulative oil and gas discovery as a function of wildcat drilling (figure 3.16 in WEO2004).

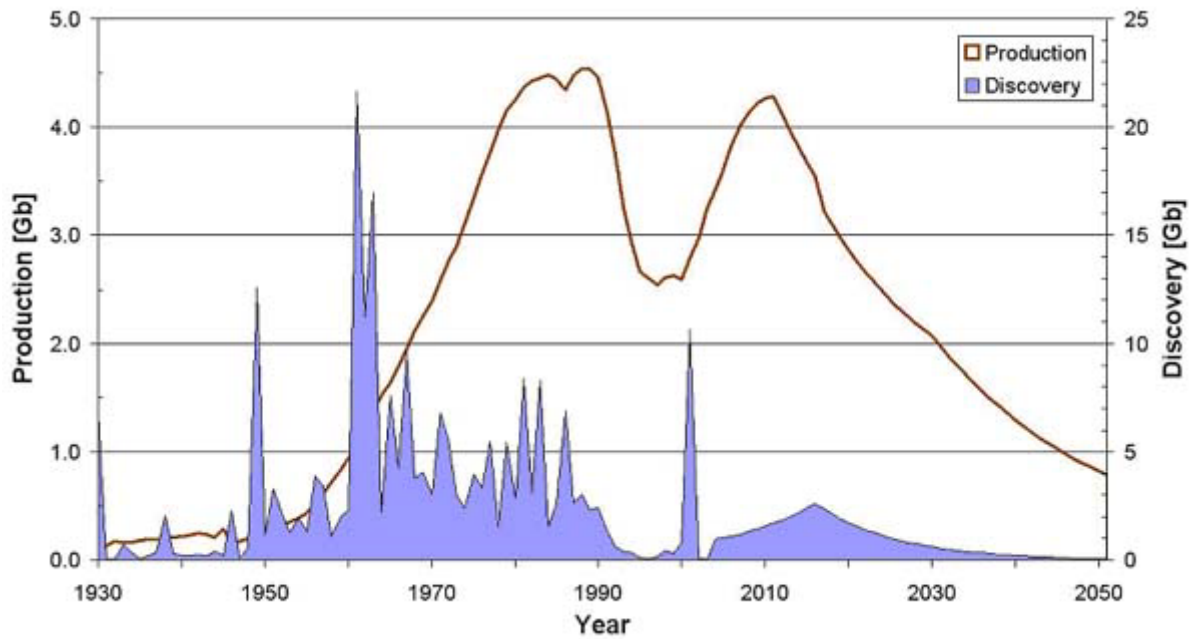


Source: BP (2004).

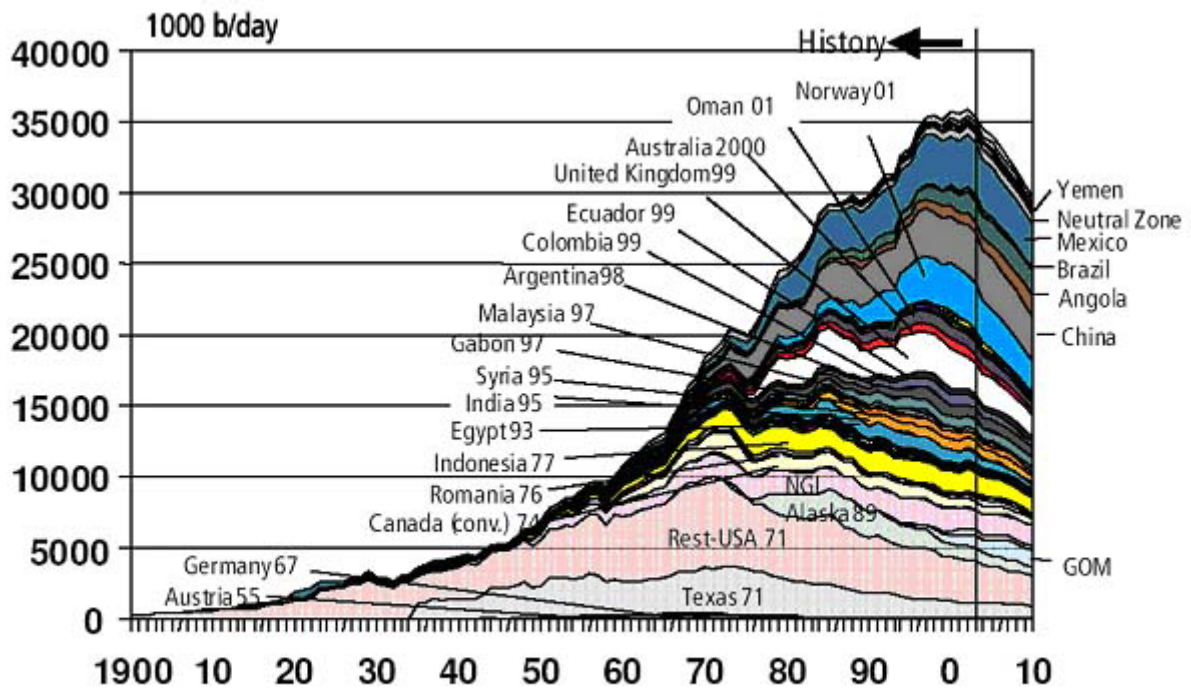
Proven oil reserves in different regions according to BP Statistical Review (Figure 3.10 in WEO2004)



World oil production by source (figure 3.20 in WEO2004)



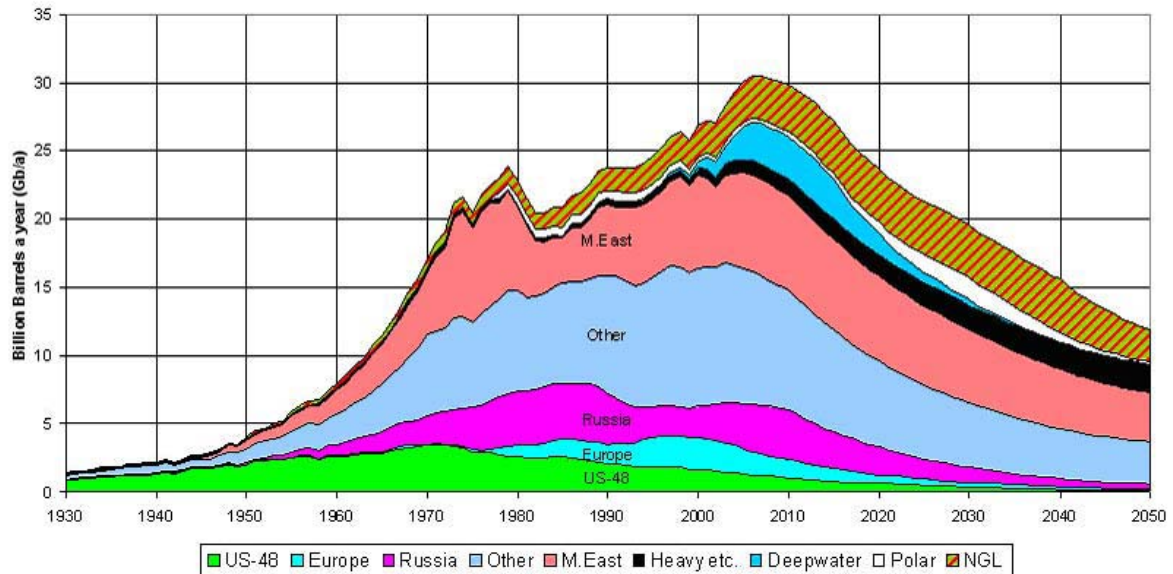
Production and discovery of crude oil in FSU (Source: University of Uppsala)



Source: Industry database, 2003 (IHS 2003)
OGJ, 9 Feb 2004 (Jan-Nov 2003)

Production of oil from "the Rest Of the World", ROW. For countries that has passed the peak production the year for the rollover is given. The other countries are expected to reach rollover within the next 10 years.

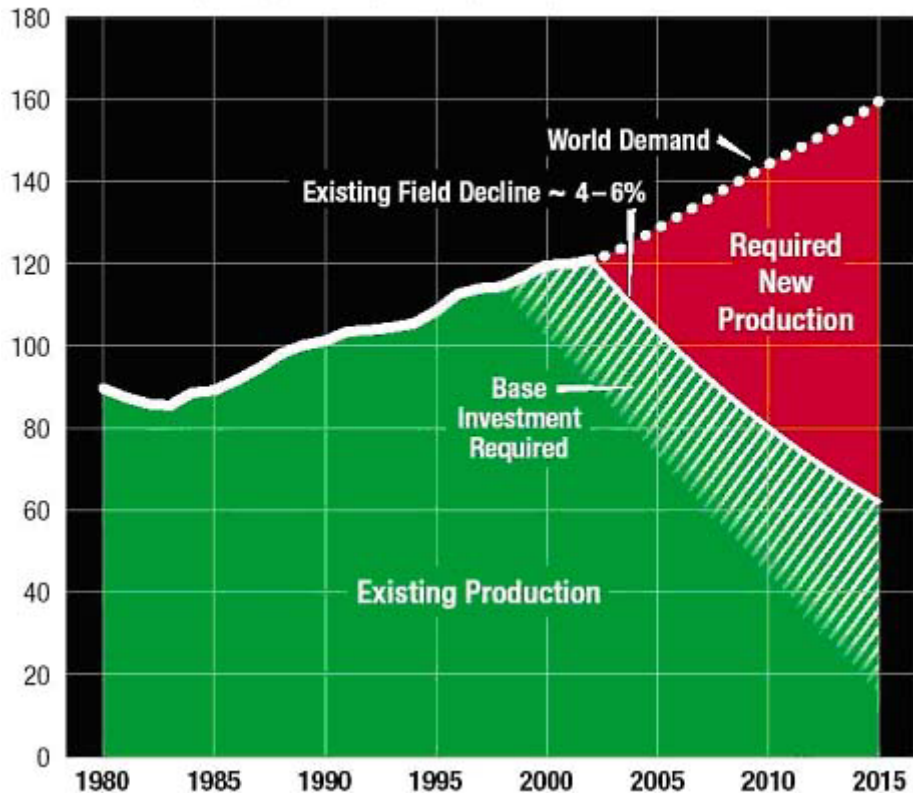
OIL AND GAS LIQUIDS 2004 Scenario



The 2004 oil and gas liquids as presented by Uppsala Hydrocarbon Depletion Study Group [8]. Oil from Deep water, Polar Regions and Natural Gas Liquids is included in the Outlook as part of different countries production of oil. We have accepted the “sustainable production scenario” for the Middle East. As seen we are including production from tar sand etc, but we think that the increase will be slower than IEA. The increase in the polar production around 2030 is from discoveries not yet made, but we think at they will start to drill in Alaska and find something in Russia

Supplying Oil and Gas Demand Will Require Major Investment

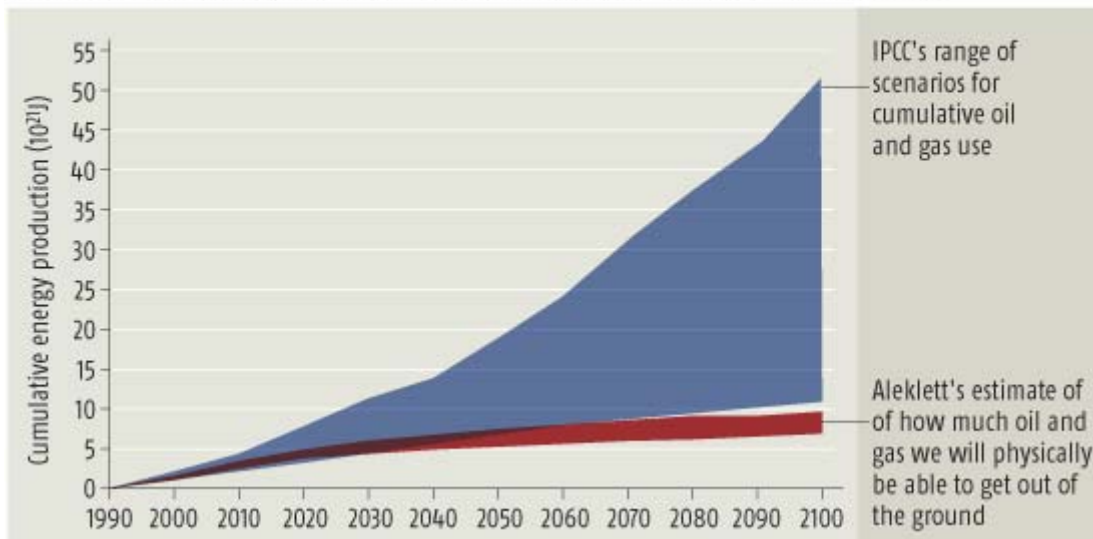
Millions of Barrels per Day of Oil Equivalent (MBOE)



Information to shareholders in ExxonMobil

ENERGY DISCREPANCY

Oil and gas reserves may not meet even the most conservative of the IPCC's scenarios



Appendix 2: Graphs and tables for the scenario base “Energy”

Primary energy sources: world and Europe

Non-renewables energy sources

a) Reserves

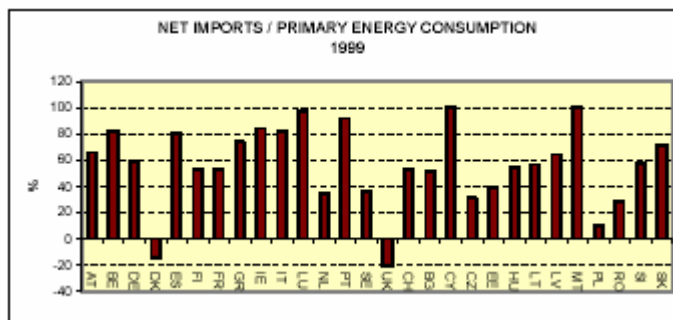
TABLE 1 - WORLD RESERVES* 1999

| | World Reserves * Gtoe | World Production Gtoe | Reserves in years | Percentage of reserves in world regions | | | | | | | | | |
|-------------|-----------------------------|--------------------------|-------------------|---|-----------------------------|-------------|-------|-------|-----------|---------------|-------|-----------------------|--------|
| | | | | Europe | Former Soviet Union **** | Middle East | China | India | Australia | North America | Japan | Central South America | Africa |
| Oil | 140,4 | 3,45 | 40,6 | 2,0% | 6,3% | 65,4% | 2,3% | 0,5% | 0,3% | 8,0% | 0,0% | 8,6% | 7,2% |
| Natural Gas | 134 | 2,1 | 66 | 3,5% | 38,7% | 33,8% | 0,9% | 0,4% | 0,9% | 5% | 0,0% | 4,3% | 7,7% |
| Coal ***** | 984211# | 2,1 | 156 | 12,4% | 23,4% | 0,0% | 11,6% | 7,6% | 9,2% | 26,1% | 0,1% | 2,2% | 6,2% |
| Uranium** | 40->2000 | 0,35 | 60->2500*** | 3% | 29% | NA | NA | 2% | 20% | 18% | < 1% | 7% | 17% |

- * economically recoverable
 ** depending on technology used; figures are for 1998
 *** based on consumption of 0,65 Gtoe and not on production
 **** Russia + other CIS countries
 ***** Including sub-bituminous and lignite.
 # million tonnes

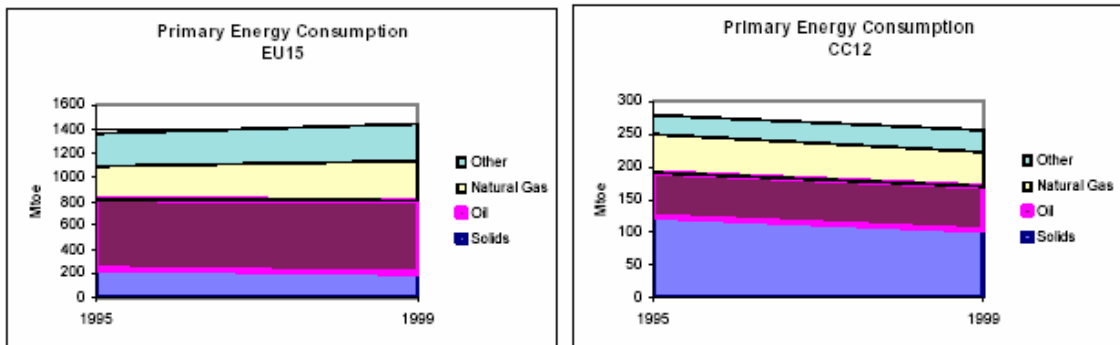
Source : BP Amoco (excluding nuclear)

European energy imports by country

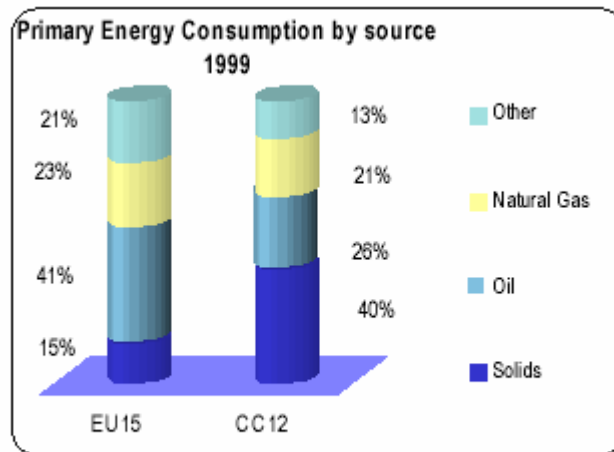


Source: ESPON study 2.1.4.

Primary energy consumption by sources

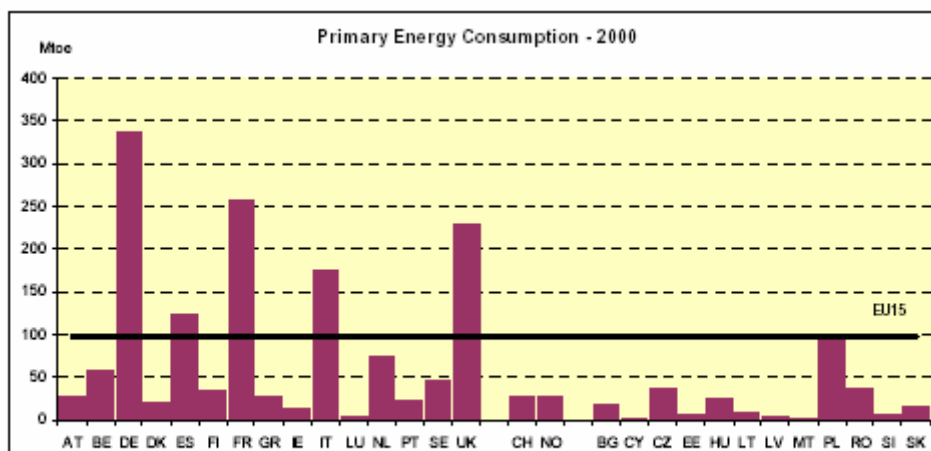


Source: ESPON study 2.1.4.

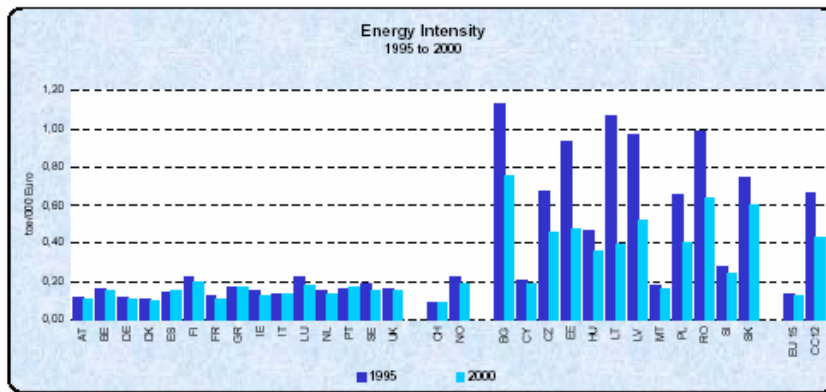


Source: ESPON study 2.1.4.

Primary energy consumption by country



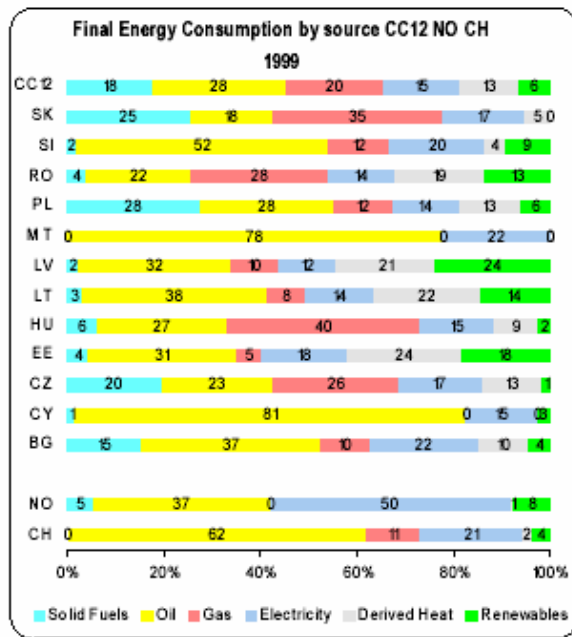
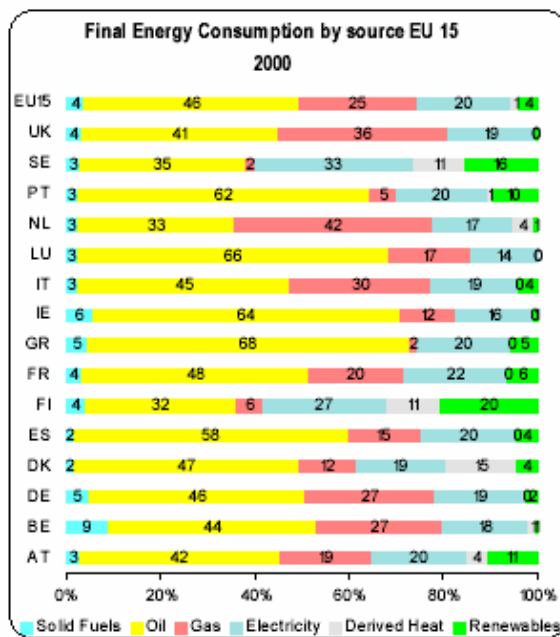
Note: 1999 for CC12, NO and CH



Source: ESPON study 2.1.4.

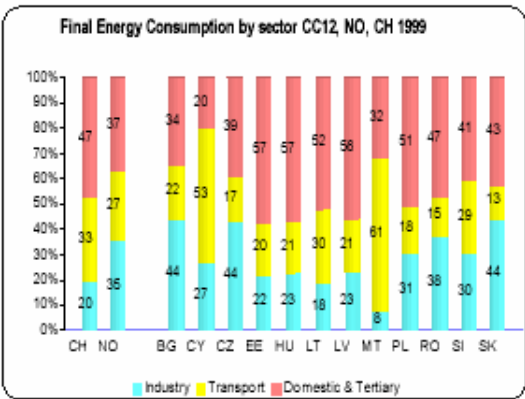
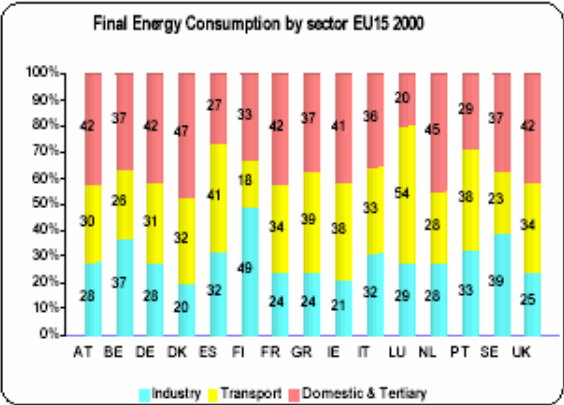
Final energy consumption

a) Structure of final energy consumption by source and country



Source: ESPON study 2.1.4.

Structure of final energy consumption by sector and country



Source: ESPON study 2.1.4.

2.4 Economy

2.4.1 Scenario base

2.4.1.1 Sources of information

The list below includes only the principal sources of the scenario base. Several other sources were considered and utilised. Their complete list is to be found in the bibliography attached to the scenario base.

For the description of secular development trends of the World and European economy the basic source was the book written by Angus Maddison: *The World Economy: A Millennial Perspective*, published by the OECD in 2001. In the description of the present macroeconomic situation, we largely used the study 'An Agenda for a Growing Europe' prepared by the High Level Group in 2003 under the chairmanship of Professor André Sapir. The description of the regional situation and development was based first of all on the *Third Report on Economic and Social Cohesion*, published by the European Commission in March 2004. An important source was the Discussion Paper of the European Policies Research Centre at the University of Strathclyde, Glasgow *Benchmarking Regional Policy in Europe*. Furthermore, we utilised the study written by the European Investment Bank, 'A survey of socio-economic disparities between the regions of the EU' (Daniel Moucque), and two articles of Christian Vandermotten from the IGEAT-ULB (*Une nouvelle typologie économique des régions européennes* and *Les disparités spatiales en Europe et leurs Évolutions: 1960-2000*). Finally, for the description of future trends, we took as basic source the study written by Ruud de Mooij and Paul Tang *Four Futures of Europe* (2003) at the Dutch Centraal Planbureau.

2.4.1.2 Trends and identification of driving forces

The world economy performed better in the last half century than at any time in history. World GDP increased six-fold from 1950 to 2000 with an average growth rate of 3.9% per year. Part of the acceleration went to sustain faster population growth, but real per capita income also rose by 2.1 per cent a year. Thus per capita growth was more than twice as fast as in the previous century.

Interrelations between different parts of the world economy have greatly intensified. The volume of commodity trade rose faster than GDP. The ratio of exports in world GDP rose from 5.5% in 1950 to 17.2 in 1998. There was a huge increase in international travel, communications and other transactions. The flow of foreign investment to poorer parts of the world also rose at an impressive pace in the past half century. As a result, the stock of foreign capital rose from 4% to 22% of Third World GDP. However, the present ratio is only two thirds of its 1914 level. Most of huge expansion in international investment in the past half century took place within the group of advanced countries.

There was a resurgence in international migration. From 1950 to 1998, West European countries absorbed 20 million immigrants, the overseas countries with a population majority of European origin 34 million. There was a distinct change in Western Europe. From 1870 to 1949 there was an exodus of people seeking better opportunities elsewhere. Since 1950 the situation has been reversed.

Within the 1950-1998 period, one can distinguish two distinct phases. The 'golden age', 1950-1973, was by far the best in history in terms of growth performance. From 1973 onwards, though international economic relationships have been intensified through continuing liberalisation, the overall momentum of growth has decelerated abruptly, and the divergence in performance in different parts of the world has increased sharply. In the 'golden age' the gap in per capita income between the poorest and richest regions fell from 15:1 to 13:1. Since then it has risen to 19:1.

| | Levels of Per Capita GDP (1990 dollars) | | | | Growth rate of Per Capita GDP | | | |
|--------------------------------|--|-------|--------|--------|-------------------------------|-----------|-----------|-----------|
| | 1913 | 1950 | 1973 | 1998 | 1870-1913 | 1913-1950 | 1950-1973 | 1973-1998 |
| Western Europe | 3,473 | 4,594 | 11,534 | 17,921 | 1.32 | 0.76 | 4.08 | 1.78 |
| Overseas European | 5,257 | 9,288 | 16,172 | 26,146 | 1.81 | 1.55 | 2.44 | 1.94 |
| Japan | 1,387 | 1,926 | 11,439 | 20,413 | 1.48 | 0.89 | 8.05 | 2.34 |
| Asia (excl. Japan) | 640 | 635 | 1,231 | 2,936 | 0.38 | -0.02 | 2.92 | 3.54 |
| Latin America | 1511 | 2554 | 4,531 | 5,795 | 1.81 | 1.42 | 2.52 | 0.99 |
| Eastern Europe and former USSR | 1501 | 2601 | 5729 | 4,354 | 1.15 | 1.50 | 3.49 | -1.10 |
| Africa | 585 | 852 | 1,365 | 1,368 | 0.64 | 1.02 | 2.07 | 0.01 |
| World | 1,510 | 2,114 | 5,709 | 5,709 | 1.30 | 0.91 | 2.93 | 1.33 |
| Interregional Spreads | 9:1 | 15:1 | 13:1 | 19:1 | | | | |

Source: Angus Maddison: *The World Economy: a Millennial Appraisal*.

Table 5 GDP levels and growth rates for world regions 1870-1998

According to growth performance, the countries of the world can be divided into three groups. The first group is that of advanced capitalist countries (Western Europe, European Overseas and Japan) which together produce over half of the World GDP. In this group, per capita growth in 1973-1998 fell below its Golden Age level, but was appreciably better than in 1870-1950.

The second group is 'Resurgent Asia', the 15 rapidly growing countries of East, Southeast and South Asia which produce one quarter of world GDP and have one half of the world's population. The success of these countries was extraordinary. They have achieved significant catch-up on the lead countries and are replicating (in various degree of intensity) the big leap forward achieved by Japan in the golden age.

The third group is that of 'Faltering Economies' (including Latin America, the rest of Asia, Eastern Europe and former USSR and Africa). Collectively they produce one fifth of the world GDP and they represent about one third of the world population. In all these regions, deterioration of performance since the golden age is alarming. In the successor states of the former USSR, it has been catastrophic. The aggregate per capita income of this group of countries actually declined by 0.21% per year in the last quarter of the century.

Since ESPON countries belong to two different groupings, their economic performance will be analysed separately.

2.4.1.2.1 Western Europe

From 1973 to 1998, the Western European GDP grew at 2.1% a year, compared with 4.8 in the golden age. The deceleration had three components: a) a slowdown in population growth, due to a significant and general fall in birth rates; b) very large rises in unemployment and other dimensions of labour slack; c) deceleration in labour productivity which grew at 2.3% a year compared with 4.8% in the preceding quarter of century.

With the benefit of hindsight, it was inevitable that Western European productivity growth would decelerate. In 1950-1973, once-for-all opportunities for catching up with the United States were available and seized, although the rate of technical progress in the US was much faster than it has been since 1973. In fact the catch-up process continued after 1973. The average productivity level in Western Europe rose from two thirds of the American level in 1973 to more than four fifths in 1998. However, per capita income in most Western European countries rose more slowly than in the United States because of slack in their labour markets.

The most disturbing aspect of Western European performance since 1973 has been the staggering rise in unemployment. In 1994-1998 the average level was nearly 11% of the labour force. This is higher than in the great depression of the 1930s. Unemployment on this scale would have created a major depression if the unemployed had not received substantial income support from social security. The major reason for this rise was a change in macroeconomic policy objectives. Initially, this was dictated by events (greatly accelerated inflation, the collapse of the Bretton Woods international monetary order, and OPEC actions to raise oil prices) but the continuance of the phenomenon reflected a basic ideological shift.

In the post-war period, the achievement of full employment and rapid economic growth have become a primary concern of national governments. In the course of the 1970s, the objectives of full employment and rapid economic growth were jettisoned, and major emphasis switched to achieving price stability.

By 1983, deflationary policies had been quite successful, and the power of OPEC had been greatly reduced. In 1973-1983 inflation in Western Europe averaged 11.2% a year, vs. 4.5% in 1983-1993. By 1993-98 it had fallen to 2.2 – about half the golden age rate. The persistence of deflationary policies in the 1990s in face of high unemployment and low inflation was due in a large measure to a new objective of policy – monetary union. The path to monetary union was not smooth. Nevertheless, the determination to succeed was very strong, particularly in countries which had historically had the biggest problems of inflation and exchange rate. They were willing to prolong the period of high unemployment to fulfil the 'convergence' obligations of membership. These policies were successful in achieving a remarkable degree of convergence and monetary union was inaugurated at the beginning of 1999.

The freedom of fiscal policies was, however, substantially restrained by welfare state commitments which are much larger than in the United States and Japan. When unemployment increased, transfer payments were triggered automatically. There was also a steady build-up of pension benefits due to the ageing of the population. Budget deficits in 1973-1996 were much higher than in the previous quarter of century. They fell only in 1997-98 when the pressure to fulfil the convergence criteria for monetary union was at its height.

Since 1973, Western European countries have placed greater emphasis on market forces for improving the efficiency of resource allocation. However, agriculture remains highly

protected, and regulation and tax policy are impediments to efficient labour market functioning.

2.4.1.2.2 New EU member states in Eastern and Central Europe

In the decades after World War II, the Soviet Union had imposed its political and economic system upon the countries of Central and Eastern Europe. They were isolated from the structural and innovative processes in the World Economy and so were doomed to lose competitiveness and lag behind in technological progress. Nevertheless, in the first period – between 1950 and 1973 – based on cheap and abundant Soviet raw material and fuel deliveries, Eastern European GDP growth more or less kept pace with that of Western Europe. From 1973 to 1990 this system faltered as the economic and political system began to crumble, with aggregate per capita growth about 0.5% per annum, compared with 1.9 in Western Europe.

Since 1990, Eastern Europe has experienced major problems in the transition to capitalist market economy, but the process has been much less traumatic than in the former USSR. Average per capita income in 1998 was more or less the same as in 1989, whereas it was more than 40% lower in the former USSR.

| Average annual growth rate of GDP in ESPON countries 1981-2002 | | | | | | | | | |
|---|-----------|-----------|------|------|-------------|-----------|-----------|------|------|
| Country | 1981-1990 | 1991-2000 | 2001 | 2002 | Country | 1981-1990 | 1991-2000 | 2001 | 2002 |
| Austria | 2.4 | 2.4 | 0.7 | 0.7 | Norway | 2.4 | 3.7 | 1.4 | 2.1 |
| Belgium | 2.0 | 2.2 | 0.8 | 0.7 | Switzerland | 2.1 | 0.9 | 0.9 | -0.2 |
| Denmark | 1.6 | 2.3 | 1.0 | 1.7 | Bulgaria | 1.3 | 0.9 | 4.0 | 4.2 |
| Finland | 3.1 | 2.2 | 0.7 | 1.4 | Czech Rep. | 1.3 | 1.5 | 3.1 | 2.0 |
| France | 2.5 | 1.9 | 1.8 | 1.0 | Estonia | 1.9 | 0.2 | 5.0 | 5.8 |
| Germany | 2.2 | 1.7 | 0.6 | 0.2 | Hungary | 0.8 | 2.1 | 3.8 | 3.3 |
| Greece | 0.7 | 2.3 | 4.1 | 3.5 | Latvia | 3.6 | -2.4 | 7.9 | 6.1 |
| Ireland | 3.6 | 7.2 | 5.7 | 3.3 | Lithuania | 3.3 | -2.8 | 6.5 | 6.7 |
| Italy | 2.3 | 1.6 | 1.8 | 0.4 | Poland | 0.8 | 4.4 | 1.0 | 1.3 |
| Luxembourg | 4.8 | 5.3 | 1.0 | 0.1 | Romania | 0.6 | -0.4 | 5.3 | 4.9 |
| Netherlands | 2.2 | 2.9 | 1.3 | 0.2 | Slovakia | 1.2 | 2.0 | 3.3 | 4.4 |
| Portugal | 3.3 | 2.8 | 1.7 | 0.7 | Slovenia | -0.6 | 2.8 | 2.9 | 3.2 |
| Spain | 2.9 | 2.7 | 2.7 | 1.9 | Cyprus | 6.3 | 4.2 | 4.1 | 1.8 |
| Sweden | 2.2 | 2.3 | 0.8 | 1.6 | Malta | 3.9 | 5.0 | -0.8 | 2.5 |
| United Kingdom | 2.7 | 2.3 | 2.0 | 1.6 | | | | | |
| EU15 | 2.5 | 1.9 | 1.5 | 0.9 | EU10 | 0.8 | 1.6 | 2.6 | 2.5 |

Source: UN Economic Commission for Europe and North America. Trends in Europe and North America. 2002 Geneva

Table 6 Average annual growth rate of GDP in ESPON countries 1981-2002

There were big differences in the success of transition among the different Eastern European countries. Poland was the worst performer in 1973-1990, but has had a more rapid income growth since 1990 than any European country except Ireland. The Czech and Slovak republics, Slovenia and Hungary recovered and slightly surpassed their 1990 levels of income. Romania and Bulgaria have fared worse, partly because their economies were severely affected by the wars and sanctions in the former Yugoslavia.

Given the fact that average per capita income in Eastern Europe is about 40% of that of Western Europe, there should have been scope for some degree of catch-up. The problems of transition were – and in fact are – very profound. The freeing up of prices and the opening of trade with the West happened relatively quickly. This put an end to shortage and queuing, improved the quality of goods available and increased consumer welfare in ways not properly captured in GDP measurements. However, much of the old capital stock became worthless, the labour force needed to acquire new skills, the legal and administrative system and the tax/social benefit structure had to be transformed and the distributive and banking structure had to be rebuilt from scratch.

2.4.1.3 The present situation

2.4.1.3.1 Macroeconomy

Europe is one of the most developed regions of the World. The level of per capita income in Europe is over three times the World average. But it is only 70% of the US level and lower than that of Japan. The desire to improve European economic performance has driven EU policy over a long period, leading to the Lisbon strategy at the beginning of the current decade. The US achieve higher per capita GDP through both higher labour productivity and higher employment input. This should imply that there is room for the EU to grow faster than the US through the assimilation of existing technology and organisational practices and through increasing activity rate. But convergence came to an end at the beginning of the 1980s and has remained unchanged since. Behind this story lies the strong divergence between EU and US performance on employment and labour productivity. Productivity increased more dynamically in Europe, but it was 'compensated' by weak employment performance and falling working hours. By 2000, about one third of the difference in per capita GDP can be attributed to lower European labour productivity, one third to fewer working hours and one third to lower employment rates. In 1970, all of the difference could be attributed to lower labour productivity.

| Factors of total productivity: EU as a percentage of the US level | | |
|--|-------|-------|
| | 1970 | 2000 |
| GDP/ Head Population | 69.0 | 70.3 |
| GDP/ Working hour | 64.8 | 90.7 |
| Working hours per person employed | 101.0 | 85.6 |
| Employment/ Working age population | 103.6 | 87.6 |
| Working age population/Population | 101.7 | 103.4 |

Source: European Commission: An Agenda for a Growing Europe. High level group led by Professor André Sapir. Brussels 2003.

Table 7 Factors of total productivity: EU as a percentage of the US level

Contrary to the post-war period where growth and catching up with the US could largely be achieved through accumulation and imitation, once European countries had moved closer to the technology frontier and with the occurrence of new technological revolutions in communication and information, innovation at the frontier has become the main engine of growth. This in turn called for new organisational forms, less vertically integrated firms, greater mobility both within and between firms, greater flexibility of labour markets, a greater reliance on market finance and a higher demand for R&D and higher education.

However, these changes in economic institutions and organisations have not yet occurred on a large scale in Europe and it is this delay in adjusting the institutions, which accounts to a large extent for Europe's growth deficit.

Let's consider these elements in turn:

2.4.1.3.2 Knowledge and higher education

The closer an economy gets to the technological frontier, the greater the importance of higher education. Overall, the US has a bigger share of population aged 25 and 64 years who have completed higher education than any EU member state and much higher than the EU average (EU: 23.8% US: 37.3%).

The future share of graduates is driven by current enrolment and expenditure in higher education. The US already spends a higher share of GDP on higher education from public sources than the EU average, but the addition of very substantial private sources means that the US spends more than double the EU average on higher education and more than any Member State.

| Total expenditure on tertiary education (percentage of GDP in 1999) | | | |
|--|--------------------|---------------------|-------------------|
| | Public expenditure | Private expenditure | Total expenditure |
| EU | 1.1 | 0.3 | 1.4 |
| USA | 1.4 | 1.6 | 3.0 |

Source: European Commission: An Agenda for a Growing Europe. High level group led by Professor André Sapir. Brussels 2003.

Table 8 Total expenditure on tertiary education (percentage of GDP in 1999)

2.4.1.3.3 R&D expenditure

Deficiencies in the level of European R&D have led the European Council to set a target for R&D expenditure of 3% of GDP. In 1999, total US expenditure on R&D at 2.6% of GDP was over a third higher than that of EU (1.9%). Nearly all of the difference can be attributed to a substantially higher investment in R&D by business. Within the EU, the low level of business R&D neglects a general North-South divide. In Sweden and Finland R&D expenditure is higher than in the US, in Germany it is as high as in the US, while in the Mediterranean countries both overall and business R&D are low. The fact that it is even lower in the new member states further increases the gap between the US and EU. The relationships between the EU and its main competitors in the area of R&D investment are shown in the graphs below, taken from the *2004 Competitiveness Report* (EC 2004b: 56).

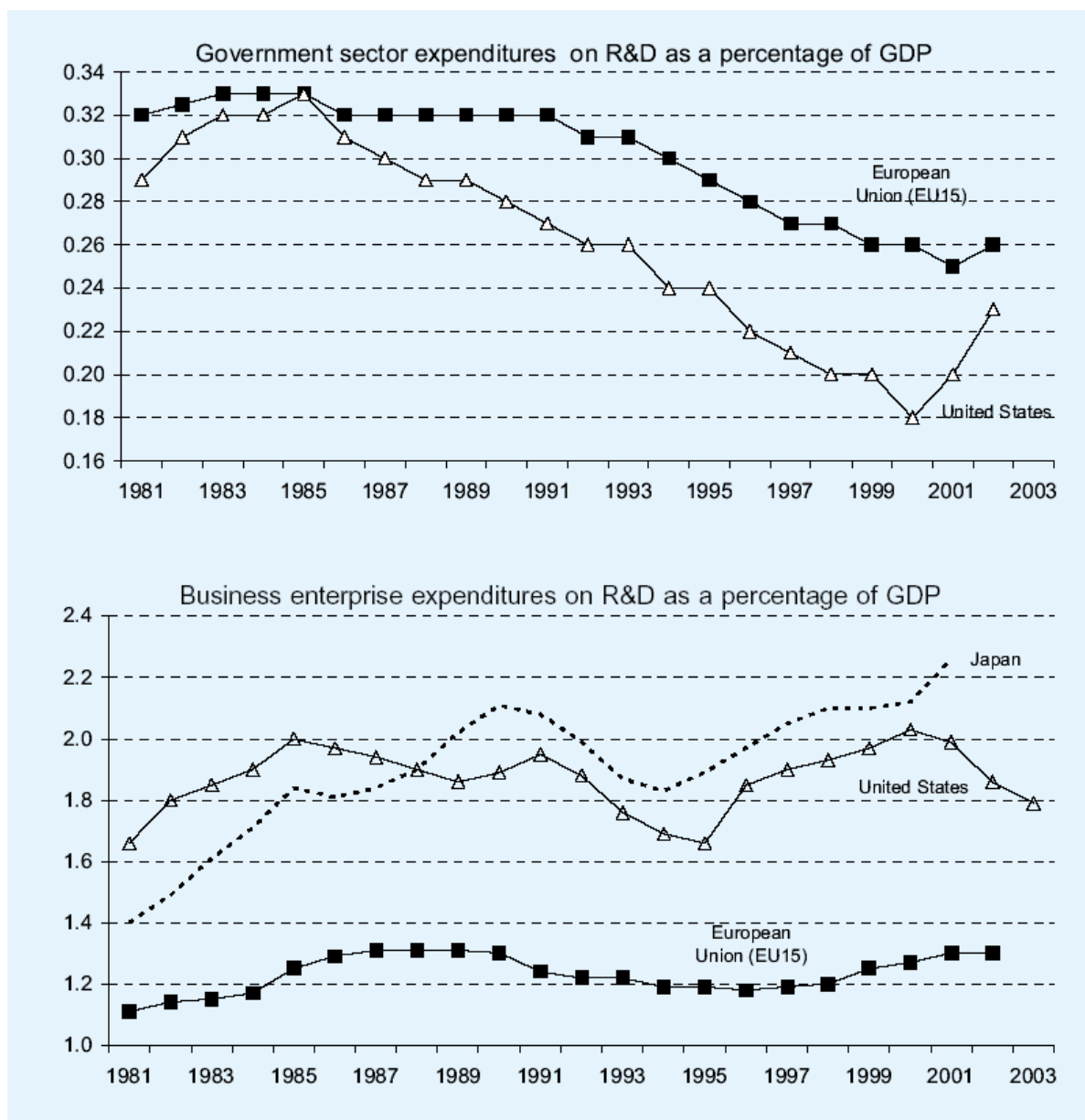


Figure 8 Evolution of R&D expenditure 1981-2003

2.4.1.3.4 New Entry and Product Markets

To the extent that new entrants more easily make innovations at the frontier, the shift to the new growth regime has increased the importance of entry and exit in the growth process. National regulations play a major role in facilitating and hindering entry. General business conditions are of particular importance for start-ups since they do not have the capacity to deal with very complex regulatory environments from the beginning. One area in which a major effort has been made is in the time and cost involved in setting up a company. Nevertheless, administrative burdens remain high in Europe. Since speed to market is an essential aspect of innovation where large proportions of total profits are often made in the first months of commercialisation, such delays are likely to depress the returns on innovation.

2.4.1.3.5 *Infrastructure*

Adequate physical infrastructure to facilitate the free flow of people, goods and ideas is required for the Single Market to function correctly. Although heavy investment has been made in the past, some of this investment is now showing its age. In addition, the new Member States still lag behind the most developed regions in their level of infrastructure provision. From the point of view of the Single Market, the most serious current deficiency lies in the fact that infrastructure has been built around national economic priorities. As a result, an integrated transport network for Europe is largely lacking, a weakness that has become much more evident after enlargement.

2.4.1.3.6 *Finance for innovation*

It has long been recognised that there is a need for strong equity backing for radical innovation start-ups where future cash flows are uncertain. The situation in this respect in Europe is insufficiently supportive. Europe's main weakness lies in the provision of early-stage financing. Early risk capital in the EU averaged only 0.05% of GDP during the years 1999-2001 against 0.17% in the US. Also the profitability of such investments in Europe remains well below that of the US. As a result, the incentive to invest in innovatory start-ups is much lower in Europe.

2.4.1.3.7 *Labour markets*

Europe's poor track record of job creation has been a major factor behind the poor growth over the last three decades. With the decline in employment rates and productivity growth and with the growing number of dependants, ever-higher taxes were required to maintain the existing level of social benefits. As a result, the tax level on labour became very high, further discouraging employment. By 2001, the tax wedge for a single worker with no children at the average production wage had risen to 43.1% against 30% in the United States. The difference between the US and Europe is entirely accounted for by social security contributions.

With the increased importance of innovation and the increased pace of restructuring, the importance of labour market flexibility also increases. Part of Europe's growth deficit has been attributed to a lack of labour market flexibility. One particular form of inflexibility, concerning the terms and conditions under which firms may employ or lay off employees, is particularly significant for growth. However, greater flexibility in both the US and the UK has been translated into greater income inequality both between and within groups. The question is how to deal with the negative effects of such variability of individual welfare.

2.4.1.3.8 *The role of information and knowledge for global competition of Europe*

Before the role of information for global competition of Europe will be examined, it is worth to say a few words on the general economic relevance of knowledge. Three general aspects should be mentioned here: First, the creation of new knowledge is at present the main source of wealth creation and economic growth (as the new economic growth theories show us). Second, the creation of new knowledge is based on the capability of individuals, firms and research institutions to collect, store, select and process the existing knowledge in an

appropriate manner, which in turn, requires a sound education system and modern R&D and telecommunication infrastructure. Third, a number of sectors are of particularly great importance as producers of new knowledge, e.g. the bio-, nano-, material- and information and communication technology (ICT). These technologies have in common a cross-sectoral character. Among these technologies, ICT is of particular importance because it is immediately associated with the distribution and processing of information and knowledge. This particular importance of ICT might be a reason for the prominent role of this technology as a subject of economic analyses about economic growth, productivity and competitiveness.

Especially recent studies and reports at the European level emphasize the great importance of ICT, which shape a core element of information economy and knowledge society for economic growth (Commission of the European Communities 2003: pp. 6-9, 21-77). According to previously published EU Competitiveness Reports, investment and diffusion of ICT were regarded as important factors for productivity growth in the US, whereas the EU showed a relative backwardness in terms of productivity impacts of ICT (ibid.: p. 7). The European Competitiveness Report 2003 highlighted that ICT capital contributed more to the *growth of labour productivity* (measured as productivity per hour) in the US than it did in Europe (ibid.: p. 8). Furthermore, the productivity impact of ICT grew faster in the US than in Europe in the second half of the 1990s (ibid.). The 2004 Review on the EU Economy (see Commission of the European Communities, 2004a) emphasizes the main reasons why the EU is lagging behind in terms of ICT. First, a strong focus of the European economy is on industries with a technological level from low to medium. Second, in contrast to the US economy, the ICT production sector (which is regarded as a crucial engine for productivity growth) in Europe is of relatively small importance. Third, the benefits from ICT use²⁰ fell back behind those, gained in the US economy (see ibid.: p. 183). The cited report comes to the conclusion that the US lead regarding the production and absorption of knowledge is primarily because "... the USA's overall innovation system is superior to that of the EU's, both in terms of the quality and funding of its knowledge sector and the more favourable framework conditions prevailing." (ibid.). The report comes to the conclusion, that in the beginning of the 1990s a successful turnaround took place in the US towards an innovation system and a regulatory frame which supports the most advanced knowledge based sectors, but not so in Europe (see ibid.).²¹

The acceleration of productivity growth due to ICT, experienced in the US economy, is largely the result of *ICT production*. Because ICT has a lower share in production in Europe than in US, in the 2004 Review of the EU Economy it is assumed that the productivity impact of ICT in Europe will not reach the same level as in the US economy (ibid.: p. 29). To explain the US-EU differences in productivity growth, the lower production share of ICT in Europe is not sufficient. A number of other reasons are listed in the 2004 Review, particularly the inadequate "national champions" policy is regarded as very problematic (ibid.: p. 183). Instead, to belong to the worlds leading players in the knowledge-based sectors requires at least an EU-wide or even a global approach to attract the best brains and resources (ibid.).

As far as the *use of ICT* is concerned, several studies emphasize the capability to interlink the use of ICT with complementary organizational changes in the business sector (Commission of the European Communities 2003: pp. 9-11). Often it is the case that the costs for organizational restructuring of businesses exceed expenditures for investments in

²⁰ The report cited mentions a number of methodological difficulties when it comes to the measurement of productivity impacts resulting from ICT use (see Commission of the European Communities 2004: p. 183).

²¹ A marked progress in terms of supporting the knowledge sector might be one of the turning points for a prospective policy scenario to be drawn in the course of the further ESPON 3.2 scenario building. However, the spatial impacts which result from an improved knowledge friendly supporting framework might come into conflict with the European objective of cohesion.

ICT capital goods (ibid.: p. 9). Empirical studies show a positive relationship between productivity growth and several forms of “enterprise resource planning and online procurement” (ibid., p. 10). However, these studies do not cover data from all EU member states, and the relationship, in a number of cases, does not show a statistical significance. Empirical data which stem from the so-called e-business watch, done by the European Commission, show that industries with higher qualified workers and with a higher intensity of information technology use applications of e-business more frequently than other industries (see ibid., p. 10). However, the adoption of e-business solutions is still low in small enterprises. Particularly low e-business activities are found in low-skill industries (ibid.: p. 11).

Against the background of the necessary catching-up process in terms of the use of ICT for reaching a greater productivity growth in the EU, a need for policy actions came up. The Lisbon Strategy set “a challenging programme for building knowledge infrastructures, enhancing innovation and economic reform, and modernising social welfare and education systems” (Presidency Conclusions 2000, p. 1). The Lisbon Strategy seeks to make the EU “... *the most competitive and dynamic knowledge-based economy in the world ...*” (ibid., p. 2, italics in original). Among a broad variety of policy the so-called e-Europe Action plan is of particular relevance, when it comes to the achievement of a top position as a knowledge society in the world.

As stated above, to become the worlds most competitive knowledge based society requires a high level of human capital and ICT-friendly skills. The report from the High Level Group regarding the Lisbon Strategy for growth and employment (Facing the Challenge 2004) highlights a number of weaknesses regarding *human capital*. First, too many young researchers who want to graduate leave Europe, especially for the US. Second, Europe shows too little attractiveness for researchers from outside Europe (ibid., p 20). If Europe wants to reach the leading position regarding the knowledge-based economy, incentives should be radically improved for keeping young well-educated people in Europe and attracting top researchers. As far as the improvement of the situation regarding the availability of top researchers is concerned, the report of the High Level Group suggests: “Further developing a system of mutual validation of national quality assurance and accreditation processes would be an important step in the right direction. It would reduce the administrative obstacles to mobility within Europe that European researchers continue to face.” (ibid.) Furthermore, the report addresses the issue of funding the universities (ibid.) and, in general terms, “... of improving their research environment and remuneration ...” (ibid.).

However, the requirements regarding human capital go beyond the attractiveness of Europe for top researchers. The report, cited above, expects: “Up to 30 % of the working population are estimated in future to be working directly in the production and diffusion of knowledge in the manufacturing, service, financial and creative industries alike. A large proportion of the rest of the workforce will need to be no less agile and knowledge-based if it is to exploit the new trends.” (ibid.: p. 19). The requirements of knowledge society for a highly qualified workforce will, in fact, concern all sectors of the economy. Against this background, the successful implementation of the Lisbon objectives requires “... the ability for workers constantly to acquire and renew skills, and for a combination of active labour market policies, training and social support to make moving from job to job as easy as possible.” (ibid.: p. 31) In this context, demographic ageing creates an additional challenge, which has to be recognized for improving the skills of the workforce. According to the report Building the Knowledge Society (Commission of the European Communities 2003 b), until now the “... digital training and the conditions of ICT introduction still appear **far from exploiting the full potential** of this change” (Commission of the European Communities 2003b: p. 2, bold in original). The 2004 Review on the EU economy reveals a growing share of support by the EU structural funds for the basic infrastructure whereas the relative

importance of support for human resources became smaller (see Commission of the European Communities 2004: p. 97).

2.4.1.3.9 *The regional structure and regional policies in Western Europe*

At the beginning of the modern age, regional economic disparities in Europe were rather moderate. The economy of an overwhelming majority of regions was based on agriculture; disparities depended on geographic conditions, the quality of the soil and on the density of rural population. Disparities began to increase with industrialisation. First, small areas became industrialised, whose productivity was generally substantially higher than agriculture. Consequently, disparities between industrialised regions and regions dominated by agriculture started to increase dynamically. Disparities among European countries decreased, but increased within countries. Industrialisation started at very different points of time in European countries, but the extensive phase of industrialisation lasted in most countries until the 1950s or 1960s. In this period, regional disparities increased in most European countries. Urbanisation and industrialisation were more or less parallel processes in this period.

Today, the regional economic typology of Europe still confirms a centre-periphery pattern. Recent geographical and structural developments show a continuous displacement of the centre of gravity of the European economy towards the South. But the fast growth of the periphery and the formation of new industrial regions that prevailed during the Fordist era are now being replaced by more complex spatial and structural changes, characterised by tertiarisation, metropolisation and recentralisation processes.

Based on the level of economic development and on the type of economic structure (Western) European regions can be grouped in three main types: central areas, peripheral areas and intermediary areas (Vandermotten and Marissal, 2000). These large categories can be subdivided into subgroups.

The central areas comprise the metropolitan areas, other central regions and 'subcentral' areas.

Metropolitan areas comprise the regions of the largest capital cities in Europe, and some other large poles of international importance (e.g. Frankfurt am Main). These metropolitan areas represent the most important command positions of the European economy, the main locations of the quaternary sector, the principal business services and financial markets. They are also characterised by a dynamic 'deindustrialisation', first of all in Great Britain, in the Benelux states and in France, but also in Germany and Northern Italy. Only industrial control functions, R&D and high-tech sectors 'survived' in the metropolitan areas. The influence and the structures of metropolitan areas are diffusing in the neighbouring 'perimetropolitan' areas in an ever increasing circle. Compared to the central metropolitan areas, the so called 'peripheral metropolitan areas' (e.g. Edinburgh, the Scandinavian capitals, but also Rome) have more limited commanding functions, remaining mostly within the national framework and related more to the non-market spheres.

The '**central non-metropolitan areas**' cover the rest of the core area of Europe. These areas generally have a strong industrial base, with a significant share of high tech and capital-intensive industries, perhaps with the exception of some parts of Northern and Central Italy, or the industrial districts of SMEs established with the help of the Marshall plan. The so-called 'Third Italy' (Tuscany, Umbria, Marche) typically represents these areas and simultaneously the transition between the central and intermediary zones.

The 'subcentral' areas have a similar structural character to the central areas, but the GDP per capita is lower than in the Pentagon (core) area. They frequently experience a decline of the old industries and difficulties of conversion. Though, in this category, the British Midland region has a higher development level of financial and market services – which is a consequence of the stronger orientation of the British economy to the private services – the other subcentral regions are generally characterised by an insufficient development of business services and local enterprise networks. This is a consequence of their missing historical experience in managing the structural change and conversion. Several regions of this type, like the old industrial areas of Wallonia, nowadays appear – paradoxically- to be 'underindustrialised' and non-market services play an important role in sustaining higher living standard and economic activity. The industrial areas of the former GDR can be regarded as an extreme variant of this type, unless their very low GDP per capita indicator attaches them rather to the areas of peripheral Europe.

The **intermediary areas** form – generally speaking – a ring around the central areas. Their GDP per head indicator is close to the European average, but the population density is – with the exception of the Third Italy - lower. These areas cover the large part of Southern Scotland and Northern England, France, the North-eastern part of Spain and the Mediterranean coast as far as Valencia, the Third Italy, the Alpine parts of Switzerland and Austria, the Northern part of Germany and the Southern part of the Scandinavian countries. One can distinguish three sub-types within these areas:

- the Fordist pericentral basins, first of all the Parisian basin, which accommodated a wide range of industries, from assembly-work to research, having used the decentralised labour force resources in the Golden Sixties;
- the industrial districts, based on the textile industry, like the already mentioned Third Italy, or areas oriented more to manufacturing of metals (peripheral part of Germany, Southern Scandinavia);
- areas in a more external situation (like the Western and South-western part of France) with a relatively higher share of the agribusiness and food industries. This does not exclude, however, that their urban poles specialise in machine engineering industry (the Basque country, Linz), sometimes even in the high-tech sectors (e.g. Toulouse).

Within the **peripheral regions**, one can distinguish (beyond the already mentioned former GDR), the Scandinavian peripheral areas and the peripheral regions in the South and in the West:

- The vast peripheral areas in Scandinavia, to which one can add the North of Scotland. These areas have – despite the weaknesses in their economic structure - a GDP per head level amounting to 80 to 90 percent of the EU15 average. Their weaknesses are: the large weight of primary, raw material and fuel production, their remoteness and their emptiness (the value of production per one square kilometre is around 5-6 percent of the EU average). The living standard can be sustained only with massive financial transfers. The very high share of non-market services (more than 150 percent of the EU average) highlights this situation.
- The peripheral regions in the South and in the West have had a rather low level of per capita GDP. With the obvious exception of the metropolises, these areas are still 'overspecialised' in agriculture, where even some archaic practices survived. The same is true for commercial activities when the area cannot rely on tourism. Outside the large cities and some isolated poles of development in the coastal areas, the industries, established through voluntarist policies in the sixties, are weak. There are two notable exceptions. One is Ireland, where the extremely intensive efforts to attract foreign – mostly American - direct investment have enabled, in a few years,

to establish a new economic and industrial structure. This structure has some common features with the industrial structure, established through the Fordist decentralisation in the Parisian basin, but the Irish industry is based overwhelmingly on electronics. Nowadays, the GDP per head figure for Ireland is higher than the EU15 average, and it can be classified rather as an intermediary than a peripheral area. The other exception is the Northern part of Portugal, also highly industrialised, but its GDP per capita figure is lower. These regions are partly similar to the 'Third Italy' (importance of the textile and clothing industries, major role of the SMEs and massive reliance on informal labour).

2.4.1.3.10 Patterns of macroeconomic and regional change in Central and Eastern Europe

The post-socialist transformation may be regarded as a laboratory of structural change – change that, in the more developed parts of the world, had taken place few decades ago (Gorzela 1996). In 1960s and 1970s highly developed countries started the process of restructuring, which led them to an increased replacing of 'industrial' economy with the contemporary 'information', or 'third wave' economy. The countries of 'real socialism' were well insulated from these changes - till the end of the socialist system they pursued the path of industrial (or Fordist) economy, which brought irresolvable economic difficulties and resulted in the collapse of an economic system unable to restructure itself.

| Countries | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 ^a | 1989= |
|------------|---------------------|------|------|------|------|------|------|------|------|------------|------|------|------|-------------------|-------|
| | Previous year = 100 | | | | | | | | | | | | | | 100 |
| Belarus | 98 | 99 | 90 | 89 | 84 | 90 | 103 | 111 | 108 | 103 | 106 | 104 | 104 | 107 | 91 |
| Bulgaria | 91 | 88 | 93 | 99 | 102 | 102 | 89 | 93 | 104 | 102 | 105 | 104 | 105 | 105 | 81 |
| Czech Rep. | 99 | 86 | 94 | 99 | 103 | 106 | 104 | 100 | 98 | 99 | 103 | 103 | 103 | 102 | 102 |
| Lithuania | 93 | 87 | 61 | 70 | 101 | 103 | 104 | 106 | 104 | 97 | 104 | 106 | 103 | 104 | 122 |
| Latvia | 103 | 89 | 65 | 85 | 101 | 98 | 102 | 109 | 106 | 101 | 107 | 108 | 106 | 107 | 58 |
| Poland | 88 | 93 | 100 | 104 | 105 | 107 | 106 | 107 | 105 | 104 | 104 | 101 | 106 | 105 | 79 |
| Russia | 97 | 95 | 86 | 91 | 87 | 96 | 97 | 101 | 95 | 103 | 108 | 105 | 102 | 103 | 135 |
| Romania | 94 | 87 | 91 | 102 | 104 | 107 | 104 | 93 | 93 | 97 | 102 | 105 | 105 | 107 | 77 |
| Slovakia | 98 | 85 | 94 | 96 | 105 | 107 | 107 | 107 | 104 | 102 | 102 | 103 | 105 | 105 | 91 |
| Slovenia | 92 | 92 | 95 | 102 | 105 | 104 | 104 | 105 | 104 | 105 | 105 | 103 | 104 | 104 | 118 |
| Ukraine | 96 | 88 | 86 | 86 | 77 | 88 | 90 | 97 | 98 | 100 | 106 | 109 | 103 | 104 | 129 |
| Hungary | 97 | 88 | 97 | 99 | 103 | 102 | 101 | 105 | 105 | 105 | 105 | 104 | 110 | 111 | 46 |

^aforecast

2000. Various sources.

Table 9 Dynamics of GDP in post-socialist countries, 1989-2003

The post-socialist transformation should be regarded as a 'normal' process of technological and organizational change, performed later than would have been the case if Central and Eastern Europe had been earlier incorporated into an open global economy. The decline in economic output which affected the post-socialist countries after 1990 was the price for restructuring which the West similarly had to pay for its socio-economic structure changes

after 1973. The restructuring process is often referred to as the J-curve trajectory (Bradshaw, Stenning, 2000), see fig.9.

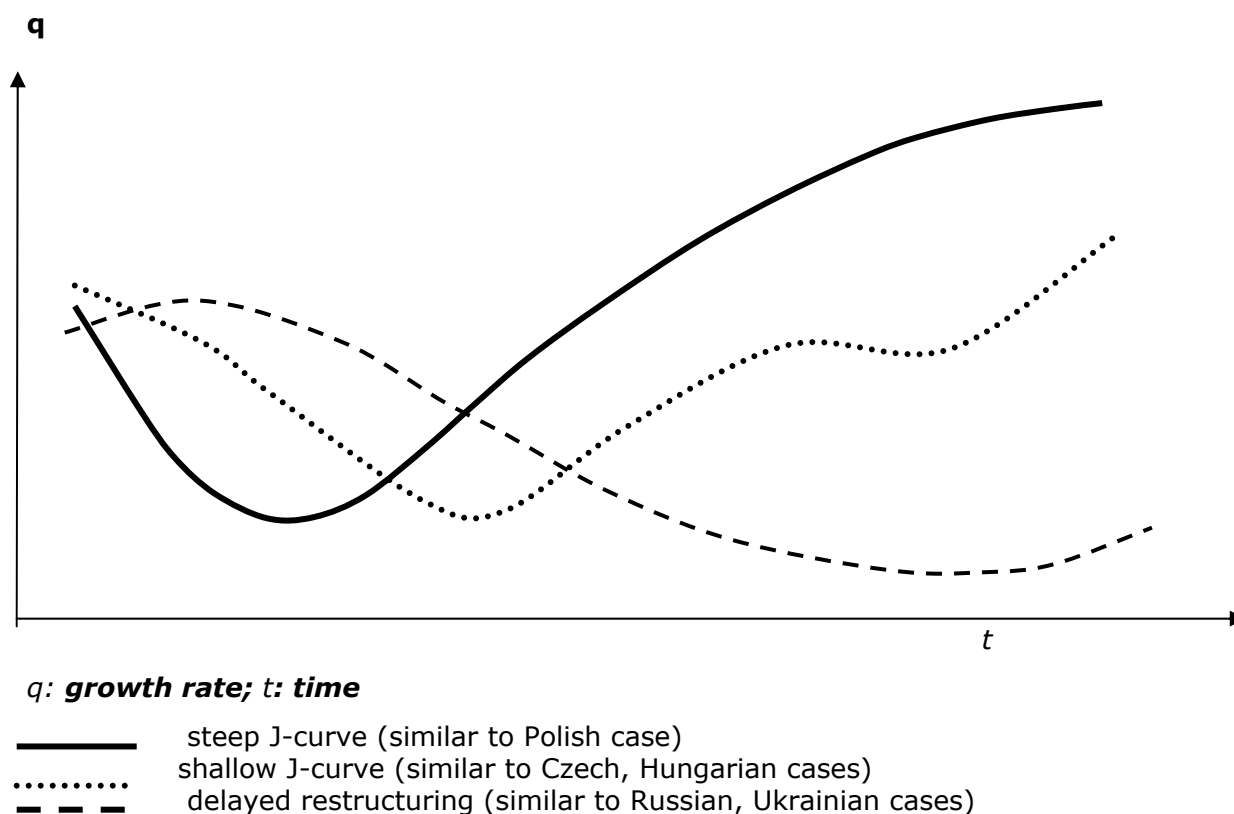


Figure 9 Different restructuring trajectories, J-curve patterns

It should be noted that largest share in stimulating development of central and Eastern Europe has to be attributed to cities though they still have to pass the process of social, economic and physical restructuring. The sooner this process begins, and the more brave and more profound it becomes – the greater the chances that these metropolitan cities will be noticed in the global metropolitan network.

The cities and regions of Central-Eastern Europe can be divided into four types of their initial (i.e. before transformation) and current situation (Gorzalak, 1998) - see fig. 10.

| | | Effects of post-socialist transformation | |
|--|-------------|---|---|
| | | Positive | Negative |
| Position in the Socialist economy | Good | <p>LEADERS Positive continuity</p> <p>metropolises and capitals</p> <p><i>diversified economy, skilled labour, good infrastructure and rich institutions</i></p> | <p>LOSERS Negative discontinuity</p> <p>e.g. industrial, 'scientific cities'</p> <p><i>monofunctional, derelict land, one-sided qualifications</i></p> |
| | Poor | <p>WINNERS Positive discontinuity</p> <p><i>tourist cities, border cities, other 'new' functions</i></p> | <p>LAGGARDS Negative continuity</p> <p><i>rural, peripheral located in poor regions</i></p> |

Figure 10 Typology of cities under transformation

There are several cities in Central and Eastern Europe that can be immediately identified as winners in the transformation process. These are, most obviously, the capital cities: Budapest, Prague, Warsaw, Bratislava. In rankings of the European metropolises they are labelled as cities with national functions prevailing over international ones. Budapest with Prague are ranked in the D-category, Warsaw with Bratislava in the E-category (the only truly global cities with A-category are in Europe London and Paris). At the same time growing regional disparities can be observed. The highest pace of development is recorded in the regions with metropolises. One should notice, however, that it is not unusual that metropolises are surrounded by lagging behind territories (see Prague, Warsaw).

Not all cities may aim to achieve the position of a global or international importance. Several smaller and medium-sized ones have to cope with their everyday problems, which - in several cases - may be quite serious, as in the former 'company towns', i.e. cities that were dominated by a single big socialist factory. However, the internal policies of the city authorities may lead to quite different paths of transformation, restructuring and development.

2.4.1.3.11 Regional imbalances in the field of information and knowledge society

The European Competitiveness Report reveals, that, despite a (slow) convergence of regional productivity levels, the differences across regions remain considerably (see European Commission 2003a: p. 13). Productivity level is positively associated with the availability of potentials regarding knowledge based economic activities. In this context, the empirical results highlighted the intensity of R&D, the endowment with human capital and the specialization in high-tech branches as the most important factors for regional competitiveness (see *ibid.*: p. 13). Furthermore, spillover effects between adjacent regions were identified – which were considered in the report, mentioned, as a sign of the importance of spatial proximity (see *ibid.*). In addition, case studies, which were conducted in the context of the European Competitiveness Report, have identified a number of additional factors which influenced the productivity level. As such factors were listed: availability of transport infrastructure (particularly access to international airports, advanced telecommunication network); a developed entrepreneurial culture, which allows strong ties between public research facilities (universities) and businesses; the existence of clusters in

high tech industries; public authorities which support strong ties between public research facilities (universities) and businesses, spillover effects resulting from networking (ibid., p. 12). The characteristics, identified above as to be important for productivity, represent fields of action for policy stakeholders, especially at the regional level (see ibid.: p. 13).

One of the characteristics which stand behind these regional disparities regarding the innovation capability are spatial differences in terms of the size structure of businesses. In regions where small businesses are predominant, the R&D investment, done by the business sector, often remain low; this does mainly concern the manufacturing sector (see Commission [2004a], p. 53). The most recent issue of the Community Innovation Survey (CIS3) shows, that the greater the business size the greater is the innovation propensity (in the sense of technology driven innovation) (see European Commission/Eurostat [2004b], p. 40). Against the background of Europe's trend towards a knowledge society, innovation does not only concern the commercialization of technological progress; it covers changes in the sphere of organization, management etc. too. The behaviour of the different business sizes regarding organizational and management changes is similar to that sketched above regarding technology driven innovations: The larger the businesses the greater the proportion of firms which conducted changes in the fields of organization and management (see ibid. p. 42). The same is the case especially with ICT-related organizational changes. The 2004 edition of the European e-Business report (see European Commission [2004c]) summarizes: "Larger firms, which can afford more powerful solutions, are more likely to benefit from efficiency gains. In fact, the diffusion of ICT infrastructure and of advanced e-business software solutions for automating business processes (such as ERP solutions and SCM software) increase steadily by company size." (ibid., p. 12). The latter mentioned size-related bias regarding the use of ICT can be regarded as particularly problematically since the use of ICT tends to be more supportive for economic growth than the production of ICT itself (see OECD [2001a], pp. 37-39). Therefore, fostering the use of ICT by European and national policies in the future requires taking into account the regional differences in the business size structures and in this context the different size-related capability to reap the benefits from ICT use.

In recent years, several reports and studies were published, which reveal that R&D activities, human capital and the high-tech industries, i. e. factors, characterized above as to be of great importance for the productivity level, are not evenly distributed among the European countries and regions. In this context, the "Third report on economic and social cohesion" confirms the existence of spatial patterns which have been well known since long: In terms of innovation capability, the European Objective 1 areas and the accession countries (which, in the meantime, joined the EU) show relative disadvantages (see European Commission [2004a], p. 51). Two of the most recent studies which comprise an analysis of a very broad range of knowledge-economy related resources were conducted within the framework of ESPON. The ESPON 2.1.2 - The territorial Impact of EU Research and Development Policies (ECOTEC [without year of publication]) and the ESPON project 1.2.2 Telecommunication Services and Networks: Territorial Trends and Basic Supply of Infrastructure for Territorial Cohesions (CURDS et al. [without year of publication]) cover a broad range of indicators which allow to draw a picture how the European regions are endowed with essential knowledge society-related characteristics. The following subsection explores parts of the data and the assessment, presented by these two studies. However, one should keep in mind that these data primarily cover a range knowledge society-related factors, which primarily represent "tangible" inputs for innovation, as there are employment in high-tech manufacturing and services, R&D personal, R&D expenditure and R&D infrastructure. It does not (at least not directly) cover "intangible" factor which can be regarded as relevant for the innovation capability. Among these "intangible" factors, the flow of so called "tacit" knowledge, i. e. of non-codified knowledge is of particularly great importance, since the latter plays an important role for coming up with innovations. Furthermore, the distinction between tacit knowledge and codified knowledge, accordingly to the economic literature, seems to be very important when spatial implications of the trend towards a knowledge society should be drawn (see e. g. Soltwedel/Laaser [2003], p. 158). Regardless the difficulties of measuring the flow of tacit knowledge, a number of indicators, listed below, e. g. Human Resources in Science and Technology and R&D personnel, can be used – at least – as proxies for the existence of conditions where tacit knowledge is likely to flow.

2.4.1.3.12 Employment in High and Medium High Technology Manufacturing

The employment in high and medium high technology manufacturing can be regarded as an indication for the capability of a region to "adopt innovations" (ECOTEC [without year of publication], p. 94). The level of employment in high and medium high technology manufacturing sectors in the EU-15 states in 2001 was on average 7.57% and 6.63% in the New Member

States (for this and the following see *ibid.*: pp. 94-95). All top 7 EU-15 regions are located in Germany. The highest proportion of the labour force employed in high technology manufacturing sectors is in Stuttgart (21.08%). Regions of Southern Europe as well as Outer London, Utrecht and Noord Holland are part of the regions with low employment in high-tech manufacturing. The examples listed show that low employment in high tech manufacturing sectors is not only a feature of peripheral areas. Within a number of countries there is a huge divide between some highly industrialized regions and rural peripheral areas (e. g. in Germany, Italy and Spain). The East European States Czech Republic, Hungary and Slovenia are above the average of EU-15.

2.4.1.3.13 Employment in High Technology Services

In 2001, 3.61% of work force in the EU-15 was employed in high tech service sectors, i. e. in post and telecommunications, information technology including software development and R&D services (for this and the following see *ibid.*, pp. 96-97). The highest level of employment in this high tech services existed in North Western Europe, London and in the South East of the UK, in Stockholm, Helsinki, Utrecht and in the Paris region. In the New Member States 2.34% of the workforce is employed in high-tech service sectors. Hungary (3.24%), Slovakia (3.03%) and the Czech Republic (3.22%) are below the average of the EU-15 countries. In sub-national terms, the employment in high tech service sectors reaches high shares in the capital regions, whereas the share is lower in peripheral and rural areas.

2.4.1.3.14 Human Resources in Science and Technology

Human Resources in Science and Technology (HRSTC) can be regarded as an indicator of the human capital potential in knowledge based economic activities. The regional distribution of HRSTC, as a %age of the total employment in the regions of the EU-15, shows two clear leaders. Six of the 25 regions on the top are located in Sweden and seven in Belgium (for this and the following see *ibid.*, pp. 87-91). Both countries are characterized by a high share of population (in working age) which possesses tertiary education, and they show a large proportion of employment in high tech sectors. Other leading EU-15 regions are in Finland: Uusimaa, Manner-Suomi; in the UK: Inner London; in Germany: Berlin; in France: Ile de France, and in the Netherlands: Utrecht. The regions listed are core respectively capital regions. Portugal, Greece, Italy and Austria showed the lowest endowment with HRSTC. Within countries in some cases the disparities in terms of HRSTC are relatively low (e. g. Sweden Belgium, Greece, Italy), in other cases large disparities between the regions exist (e. g. in UK and Spain). However, the report cited expresses some doubt regarding the international comparability of data of the level of educational attainment. So far as the trend is concerned, a number of non-core areas of EU-15 countries show relatively strong growth rates.

2.4.1.3.15 Population with Tertiary Education

The share of population at working age with tertiary education can be regarded as a proxy for the regional capability to "adopt new innovations" (*ibid.*, p. 98). In the EU-15 countries on average, the proportion of population at working age with post secondary education was 21,2% in 2001 (for this and the following see *ibid.*, pp. 98-100). Regions with the highest education level are located in the Nordic states, in several German regions, in the Netherlands and UK. The lowest levels existed in a number of regions in Portugal, Italy and in Greece. The New Member States Cyprus, Estonia and Latvia have rates above the EU-15 average. The case of the Scandinavian countries shows that a high proportion of population with tertiary education is not limited to European core regions. However, a certain centre-periphery divide is visible with respect to the southern periphery (parts of Portugal, Spain, Italy and Greece). Nevertheless, the interregional comparability of data on educational attainment level is not fully given, as the comparison between East Germany and West Germany shows.

2.4.1.3.16 R&D Expenditure

R&D expenditure is measured as a %age of GDP ("R&D intensity"). Regions with the highest R&D intensity are mostly located in EU-15 countries. For example, five of these regions are located in Germany (Braunschweig, Stuttgart and Oberbayern were the top three), two in Finland (Pohjois-Suomi and Uusimaa). Furthermore, Midi-Pyrénées in France and Sweden as a whole (there are no regional data available) belong to the top-ranking regions in terms of R&D expenditure (for this and the following see *ibid.*, pp. 76-83). The new Member States have lower levels, but regions like Prague and the surrounding area, the Polish region of Opolskie, the Hungarian

capital region are placed among 25 on the top. The survey shows that concentration R&D expenditure is particularly highly in and near capital regions. A share of R&D expenditures below 1% show regions of the cohesion countries Greece, Spain and Portugal, and the new member and accession countries (with exception of the Czech Republic and Slovenia). However, a number of peripheral regions show an above average increase of R&D expenditures. This is the case with business R&D expenditures too.

2.4.1.3.17 R&D Personnel

Except of Italy, Spain, Greece and Portugal where most of R&D personnel is employed in the Higher Education sector, the R&D personnel is mainly employed by the private sector (for this and the following see *ibid.*, pp. 83 to 87). In 1999 the average share of R&D employment in the EU-15 was 1.36% of the total labour force. Nine of the 25 top-ranking regions were identified in Germany (e. g. Oberbayern, Braunschweig and Stuttgart), three are located in Sweden, and two were identified in Finland). But also regions like the capital regions of and around Bratislavsky, Budapest, Sofia, or Warsaw are ranked among the top 25. The lowest endowment with R&D personnel is given in a number of regions at the periphery, particularly in the cohesion countries and in a number of East European regions. The number of personnel employed in R&D did not undergo significant changes between 1995 and 1999.

2.4.1.3.18 Research and Innovation Infrastructure

Each of the EU-15 states has at least one region in the leading group of regions with a "strong university base, or a balance between Science Parks, Business Innovation Centres and Universities" (*ibid.* p. 93). However, the availability of R&D infrastructure is highly concentrated in a small number of region (for this and the following see *ibid.*, pp. 91-94): "4% of EU regions account for 40% of the leading research universities and institutes; 46% of recognized Science Parks and 25% of Business Innovation Centres. In contrast, 76% of regions contain none of these." (*ibid.*, p. 93) In the 12 New Member States and Accession Countries, there are only 18 Science Parks (recognized ones) and 10 Business Innovation Centres. Regarding the leading EU regions (in terms of R&D infrastructure) separately, more than 50% of the respective infrastructure is concentrated in 7 regions, primarily in capital regions. However, a sound research and innovation infrastructure is a necessary pre-condition for the knowledge creation but it is not sufficient. E. g., a case study, conducted by the Halle Institute for Economic Research (IWH) about the economic impact of the public research institutions for the business environment in the Halle region, brought up the finding of a mismatch which arises from the nature of the majority of the Halle firms as small and therefore, in a yet weak financial situation, in which the purchase of R&D services is not affordable (see Rosenfeld et al (2005), pp. 143, 144).

One of the factors which was mentioned above as to be relevant for the productivity level is the availability of telecommunication networks. The ESPON 1.2.2 project gives a broad overview regarding the territorialities of different types of telecommunication technologies. So far as the most advanced of them (in the ESPON 1.2.2 these ICTs were named "leading edge" technologies and applications" (CURDS et al. [without year of publication], p. 20) are concerned, that is, broadband, e-commerce and Pan-European fibre internet backbone networks, the relevant report highlights the following spatial patterns.

2.4.1.3.19 Broadband

In terms of broadband, Europe on average lags behind a number of developed economies (South Korea, Canada, Hong Kong and Taiwan) (for this and the following see *ibid.*, pp. 7, 20-22, 110-138). But a number of European States (Denmark, Sweden, Belgium, Austria and the Netherlands) better perform than the United States and Japan. The roll out of broadband is mostly takes place at first in densely populated, urban areas. For example, in France 74% of the population with access to broadband live in 21% of the French territory. A number of new Member States, Malta, Estonia and Slovenia, have higher rates of penetration of broadband than some EU-15 countries. In general terms, a high uptake regarding broadband is associated with high levels of GDP per capita, high population density and the affiliation at core of Europe (with some exceptions). There is some fear that regional disparities regarding the access to broadband continue to exist, which face the "less favoured regions" (*ibid.*, p. 112).

2.4.1.3.20 E-commerce

At the end of 2002, 86% of enterprises in the EU-15 countries had access to Internet and 54% of them had an own website (for this and the following see *ibid.*, pp. 22-23, 138-148). At the end of 2001, 30% of enterprises with Internet use had established e-purchasing and 13% had realized sales via the Internet. At the country level there is some evidence for a north-south and west-east divide. Sweden, Finland, Denmark, the UK and Germany have the highest incidence in terms of e-purchasing, Greece, Italy and Spain the lowest. The highest level of e-sales show Denmark, the Netherlands, Austria and Ireland, the lowest Italy, Greece, Spain and Portugal. The intensity of e-commerce (i. E. its use) is greater in EU-15 countries than in N-12. A comparison at the regional level reveals, similarly to the cross-country comparison, the north-south pattern. Regarding the West-East divide, the picture is not so clear. For example, high e-commerce activities were recorded in the Praha and Bratislavský regions.

2.4.1.3.21 Pan-European fibre backbone access

The report cited, assumes: "It is unlikely, for example, that a region without access to pan-European infrastructure would be able to attract substantial economic investment ...". (*ibid.*, p. 150) The greatest number of networks can be found in a Pentagon area comprising London, Paris, the Ruhr area and Hamburg (for this and the following *ibid.*, pp 149-161). Countries like Greece, Portugal, and regions like Scotland or southern Italy, northern regions in the Nordic states and Eastern Europe (with the exception of Praha and Budapest) have low facilities.

2.4.1.4 Relevant EU policies

After securing peace amongst its members, the common market — an economic project — is arguably the primary function of European cooperation. The European Union does not itself conduct a specific economic policy, however. Instead, various sectoral policies are implemented to help meet economic goals or to regulate the common market. On the other hand, since 2000 the European Union does have a clear economic objective, namely that articulated in Lisbon to make the EU *'the most competitive and knowledge-based economy in the world.'* This section will address three sectoral policy areas that are commonly linked with achieving this objective: competition policy, R&D policy and regional policy. In so doing, each of these policy areas will be placed into its historical context, its possible contribution to the Lisbon Strategy and the measured or expected impacts of these policies on spatial development.

2.4.1.4.1 Competition policy

The mission of EU competition policy is relatively straightforward: to ensure and support the workings of the common market. Specifically it seeks to guarantee fair and open competition by abolishing protectionism and monopolies (both public and private) and by establishing a 'level playing field' for market players. This free market approach of opening up the marketplace has gradually overtaken the classic Keynesian approach to industrial development in Europe, especially since the 1990s. This has had profound impacts on the volume of trade, and on economic and therefore spatial development, in the participating countries. In addition, EU competition rules cover not only businesses established in the EU, but companies operating or having an impact in the EU marketplace. Finally, as we shall see, competition rules also affect spatial development processes, which in a number of cases have an uneasy relationship with other sectoral EU policies such as regional policy, environment and economic stimulation (e.g. R&D) policies.

Historical overview

As a protector and champion of the common market, the history of competition policy is irrevocably tied to that of European economic integration. In fact, the treaty establishing the European Coal and Steel Community (ECSC) — the first step towards a common market — already included antitrust clauses to prevent the ECSC from evolving into a 'gigantic European cartel' (Dinan, 1999: 380). The common market has since been the main building block of further cooperation between the Member States. The Single European Act, a milestone in European history, was based on the 1985 White Paper *Completing the Internal*

Market, which contained over 300 proposals – centring on the free movement of goods, services, capital and labour – to be introduced by the Member States before 1992 to guide the transition to a true common market (Williams 1996: 82 cited in Van Ravesteyn and Evers 2004). In 1992, the Maastricht Treaty establishing the European Union introduced a requirement on Member States to conduct an economic policy consistent with the premise of an open market and free trade (Article 86).

On this basis, the EU has imposed rules prohibiting ‘agreements and concerted practices between undertakings that prevent, restrict, or distort competition and that affect trade between Member States’ (Dinan, 1999: 381). Generally, this concerns a market domination of over 50%. Since 1962, the Commission has also had the power to send officers unannounced to companies to monitor compliance, but this did not become a major issue until the wave of mergers which transpired in the 1980s following the establishment of the single market. By 1989 a regulation was in place requiring prior authorization of mergers from the Commission. Historic cases include the blocked merger of Kirch and Deutsche Telekom in 1994, and Nestlé’s takeover bid of Perrier in 1992 (Dinan, 1999: 384).

State aid

Another internal market issue is state aid. Government subsidies to companies are generally considered a form of unfair competition and Article 87 of the EU Treaty forbids any form of public support to businesses that could distort competition and free trade across national borders; Article 88 requires that Member States declare state support measures to the European Commission for approval. Although this had been a major issue in competition policy for decades, and there was a widespread acknowledgement of the resulting market distortions, there was little enthusiasm amongst Member States during the 1970s and early 1980s to halt support to national industries, due to political pressure to maintain employment levels. To address the patchy implementation of these rules, EU Member States signed an agreement in March 2001 in Stockholm to reduce state aid by 2003. The efforts to monitor and control public-sector support to private enterprise were further institutionalised by the establishment of an aid register, or ‘scoreboard’ (European Commission 2000: 29 cited in Van Ravesteyn and Evers 2004). One case in which state aid did make a clear difference was Air France; after announcing its plan to grant aid to the highly subsidized, yet still ailing, company in 1995, the Commission demanded this be the last bailout, which was subsequently used to convince workers to end a strike.

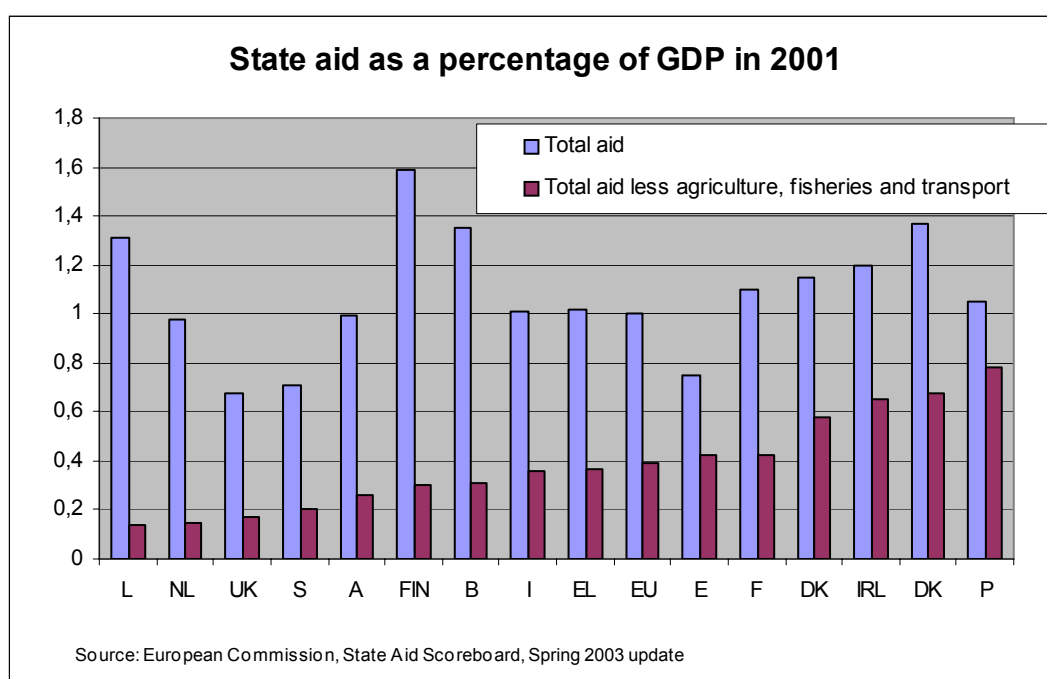


Figure 11 State aid as a percentage of GDP in 2001

The matter of state aid has been included in the Draft Constitution (Article III-56). According to this document, Member States may support businesses only in certain cases: when it serves social policy by supporting individuals (small entrepreneurs); to repair damage, for example resulting from natural disasters; and aid by Germany to its *Neue Länder*. The Draft Constitution also acknowledges that financial support may be given to achieve certain worthy policy goals, such as regional cohesion policy, or to preserve cultural heritage, or in cases where other EU interests are apparent and/or when EU permission has been granted.

European state aid policy can affect spatial developments by interfering with the provision of development incentives. State aid rules can also complicate the ability of local authorities to become actively involved in the development process by entering into public-private partnerships, which goes against the general trend in planning (and is therefore being contested by the UK, which is accustomed to conducting urban development in this manner). In many cases, however, there is no EU intervention because the amount of state aid is considered minimal: if a company receives less than €100,000 over a three year period, approval by the European Commission is not required. In addition, permission will probably be granted for urban renewal, incentive packages for small and medium-sized enterprises, environmental clean-up and rural development because these generally correspond with other EU policy areas. However, EU regulations may create problems for spatial planning policies which seek to support areas with economic potential. Even in clear cases of regional cohesion, the EU may find public support unacceptable if it believes this is no longer necessary (European Commission 2000: 30 cited in Van Ravesteyn and Evers 2004).

A related issue is the harmonisation of the tax code among Member States, since low taxes can be viewed as a form of state aid. For example, the tax shelter currently offered by the Dutch Government to parent companies for the foreign earnings of their subsidiaries has recently come under fire from the EU. The existence of this rule may help explain the number of international headquarters located in the Netherlands. The Dutch are of course not alone in this: Ireland favours industrial companies and Luxemburg financial ones. The EU is now considering further measures that would prohibit Member States from offering such incentives as part of its wider objective of tackling harmful tax competition in the European Union (Diaw and Gorter 2002 cited in Van Ravesteyn and Evers 2004)²². Although this is pure speculation, such rules, if imposed by the EU, may induce mobile capital to relocate, which could have a negatively impact on the office market in countries that had offered incentives.

The EU has also set rules on public procurement that seek to ensure fair competition between companies for government contracts, especially between Member States²³. For example, Directive 90/531/EEC on the procurement procedures of entities operating in the water, energy, transport and telecommunications sectors (and subsequently Directive 2001/78/EC on the use of standard forms in the publication of public contract notices) aims to create a transparent international market for utility companies. Directive 93/37/EEC regulates activities, such as the construction of public facilities and infrastructure, that cost more than €6.24 million and Directive 97/52/EC regulates government contracts for services exceeding €249,681: such contracts have to be issued according to European rules, including standards for publication and translation of tenders and selection criteria (Klingevan Rooij et al. 2003: 75, 79 cited in Van Ravesteyn and Evers 2004). Basically, what all

²² Although the authors agree that there are problems with the current situation in which Member States compete for companies by offering tax incentives, the proposed EU rules are likely to make the situation worse. This is because they only apply to measures aimed at attracting and retaining mobile capital; if these are prohibited, countries can be expected to lower their generic corporate tax instead, which will reduce tax revenues.

²³ Before such legislation was introduced, only 2% of public contracts were awarded to non-national firms (<http://europa.eu.int/scadplus/leg/en/lvb/l22001.htm>).

this means is that, since the early 1990s, governments in the EU have not been entirely free to decide who they will contract out work to or purchase goods from. After the publication in 1996 of the Green Paper *Public Procurement in the European Union*, the EU embarked on modernising this policy and improving compliance with its provisions. These measures will have consequences for planning practice, particularly when this involves a public-private partnership²⁴. The precedence given to EU rules can lead to astonishing results. Even in cases where private parties are granted the right by Dutch law to develop their own land (if deemed capable), according to the provisions of the local plan, EU competition policy will override this right to develop if the development in question is commissioned by a public body and exceeds the threshold (Klinge-van Rooij et al 2003: 75 cited in Van Ravesteyn and Evers 2004). Since local authorities in such cases are no longer completely free to choose their partners, but must put the work out to tender, this can complicate the establishment of public-private partnerships.

Liberalisation

European competition policy has focused on liberalising telecommunications, energy, postal services and air travel and allowed the purchase of cars in other Member States (a measure which has complicated efforts by some countries to conduct environmental policy via the price mechanism). This has also had large spatial impacts. The opening up of the telecommunications market to competition has not only resulted in lower prices for consumers, but has led each competitor in the mobile telephone market to set up its own network. As a result, there are more antennas on the roofs of buildings and masts in the countryside than if there had been only one provider. The liberalisation of the energy market has potentially far-reaching consequences. Directive 1996/92/EC concerning common rules for the internal market in electricity was implemented in 1999 and the operation is expected to be completed in 2004. This directive abolishes exclusive rights, requires unbundling of network activities from generation and supply activities and includes measures for transparency and non-discrimination (European Commission 2002d). The free operation of the market is expected to result in corporate concentration at the European level, and three of the four largest Dutch generators, for example, have already been acquired by foreign multinationals (CPB 2003: 62). The most obvious consequence is that locational decisions on where and how to supply energy in the future will involve discussions with internationally operating private companies. At the same time that the EU is promoting the liberalisation of the energy market, it has issued a directive setting a target for renewable electricity consumption in the EU of 22% of total electricity consumption (van Sambeek et al. 2003 cited in Van Ravesteyn and Evers 2004). Apart from the obvious environmental benefits, this is motivated by a concern that the patchwork of policies currently in place in Member States to promote renewable energy has made the internal market less transparent and may constitute a form of unfair competition. The EU is also turning its attention to the liberalisation of waste disposal. The workings of the internal market (specifically the provisions of Council Regulation No.259/93 on the supervision and control of shipments of waste within, into and out of the European Community) have already led to the further consolidation of waste disposal companies and their expansion into other markets, such as energy and water. Recent measures include harmonisation of specifications, test methods and standards, improvement of market transparency, and

²⁴ The 'Grensmaas' river works project in the Dutch province of Limburg serves as an example of how this branch of EU competition policy can interfere with planning. The project involves widening the banks of the Meuse, gravel extraction and stimulating natural processes. Rather than allowing companies to bid for the contract openly, the €450 million contract was simply awarded to a Dutch company that already owned land along the riverbanks. A Belgian company subsequently complained to the EU of being excluded from competition, and the Dutch have received a reprimand from Brussels. This conflict has delayed the project significantly. For some time there was a stalemate because the partners indicated that they were not yet ready to tender. A bilateral solution is now being developed in which the project is being subdivided and reallocated between different parties to avoid a tender, but no definite agreement had been reached at the time of writing (spring 2005). One thing is clear, however: even public procurement rules can severely disrupt planning practice.

measures to stimulate innovation and recycling. It is expected that the liberalisation and achievement of a 'level playing field' in these areas will be completed by 2010 (Ruijgrok and Erbrink 2000: 27 cited in Van Ravesteyn and Evers 2004). At the same time, several Member States are showing signs of increasing resistance to the ongoing liberalisation, arguing that intervention is justified in sectors serving the public interest (Ministerie van BZ 2003: 96 cited in Van Ravesteyn and Evers 2004).

Liberalisation in the transport sector has had significant albeit indirect spatial effects as well. Shortly after the semi-privatisation of the Dutch railways, for example, it was announced that unprofitable lines were to be axed from the network unless additional subsidies were granted. The liberalisation of the air travel market will have ramifications for both mobility as well as company location decisions. The 'Single European Sky' seeks to harmonise aviation regulations throughout the EU to improve market transparency and (in the case of environmental regulations) promote a level playing field. Rationalised and standardised rules will also enable a greater volume of air traffic in Europe, with obvious consequences for mobility and the environment. The liberalisation of the air travel market has encouraged the development of regional airports and small budget airlines (interestingly, this contradicts both EU environmental and transport policies)²⁵. Germany and Belgium are already investing heavily in regional airports near the Dutch border although Belgium has come into conflict with another aspect of EU competition policy, on state aid, when it attracted Ryanair to its small Charleroi airport. In addition to the encouragement of privatisation, the most important change is the abolition of the 'home carrier' rule, allowing national airlines to depart from any EU hub they wish. The bilateral Open Skies Agreement negotiated between the EU and US will create an even larger internal market – allowing departures from any EU/US hub – and is likely to result in additional corporate consolidation; the KLM/Air France merger is a good example of this. The effect this will have on Schiphol and its surrounding area is the subject of much speculation and debate. One thing seems certain: the advantage that KLM enjoyed over its European rivals from its special arrangement with the US will disappear as a result of EU competition policy.

Economic impacts

Between 1958 and 1972, under a common customs policy and eradication of internal trade barriers, trade between the participating EEC countries grew three times faster than trade with non-participants (European Commission 1999: 6 cited in Van Ravesteyn and Evers 2004). The enlargement will bring far-reaching changes to the internal market. This may be less dramatic a change than some might expect: free trade via trade agreements (Europe Agreements) has already been in place since the fall of the Iron Curtain in 1990, and sectors such as the automobile industry, retail and telecommunications have been quick to take advantage of this. Although the Europe Agreements have provided for free trade between EU Member States and the candidate countries, the internal market also requires that trade regulations be standardised throughout the Union. The incorporation of EU legislation on food quality, intellectual property, consumer protection, contracts and fair trade will further facilitate and accelerate the free flow of goods (CPB 2003: 25 cited in Van Ravesteyn and Evers 2004). The enlargement will also offer new opportunities for businesses and individuals to relocate to the new Member States, which may affect the property market; some Dutch property investors and developers are quickly expanding their operations into Eastern Europe. Much of this concerns the purchase of second or holiday homes. There has already been some sign of business relocations, although the evidence for this – for example, Heineken produces beer in Slovakia under the name Zlaty Bazant, and Dutch farmers are emigrating to Eastern Europe, especially Poland – has generally been

²⁵ Already this mode of transport enjoys immunity from taxation on aircraft fuel since the 1944 Convention on International Civil Aviation (Chicago Convention) and exemption from VAT on airline tickets (unlike other forms of travel).

anecdotal rather than structural in nature (Bruinsma and Hakfort 2004 cited in Van Ravesteyn and Evers 2004).

What effect has this had on business structure? In general, an expanded market area and deregulation is accompanied by corporate consolidation. Although this usually leads to price reductions and expanded choice for consumers, it can also have adverse market effects. Supermarket chains, for example, may gain spatial monopolies in an unregulated market by acquiring their competitors. The potential spatial impact is obvious: the company involved can close some of its outlets and still retain its market share. To prevent this from happening, the European Union has also been active in regulating mergers, and in some cases has blocked them (European Commission 2000: 19-22 cited in Van Ravesteyn and Evers 2004). EU competition policy, therefore, involves both the deregulation and re-regulation of markets in a continual process of fine-tuning the balance of power between economic actors. The liberalisation of markets can also create spatial competition (between cities and regions), putting strategic locations at an advantage and aggravating regional disparities (Committee on Spatial Development 1999: 14). In this sense, EU competition policy is often in direct conflict with EU regional policy, and in some senses R&D policy, the subject of the next section.

2.4.1.4.2 R&D policy

The common market was established within the framework of a highly interventionist stance by most governments towards the economy. Indeed, elaborate welfare states, major state-owned companies and generous subsidies to various branches of industry were the rule in early post-war Europe. One of the first major policy areas has been the CAP, which provided public support to the agricultural sector. Over time, much of this direct aid has been abolished (in the case of privatization and state aid requirements) or redirected. Regarding the latter, one way in which public support of industry and employment continues is via investments in education and training, and in research in areas where the commercial payoff is not immediately apparent, but may have long-term strategic importance. This is the cornerstone behind the philosophy of EU R&D policy (Dinan, 1999: 397-401).

Policy history

Since the 2000 Lisbon summit, R&D has been high on the European political agenda. Its topicality does not necessarily mean that it is a new issue; the EURATOM Treaty of 1957 set up an EU joint research centre to study nuclear activities. However, R&D policy did not really get off the ground until the ESPRIT (European Strategic Programme for Research and Development in Information Technology) proposal in 1982 which 'called for major European manufacturers, smaller firms, universities, and institutes throughout the EC to collaborate on 'pre-competitive' (basic) research' (Dinan, 1999: 397). This was supplemented with the funding of 38 projects the following year as a pilot project. The following year (1984) the First Framework Programme (FP) was established with a budget of € 3.27b. At present, European R&D policy is a well-established EU policy area. FPs are implemented as contracts on a project basis. Over the years, the FPs have not only supported research, but through their funding criteria have sought to alter its method and content according to stated objectives. Since R&D is generally carried out by universities and the private sector, public policy directed at it generally takes the form of subsidies rather than direct participation. This fact lies at the heart of the administration of EU R&D policy. Like regional policy, this generally occurs on the basis of matching and includes criteria tied to other policy sectors. According to ESPON 2.1.2:

Until the end of FP5, a substantial proportion of Framework' Programme funding went to 'shared-cost' research actions. These are research projects put into effect by multinational consortia made up of firms

(including Small and Medium-sized Enterprises, SMEs), research centres and universities, eligible to receive 50% of their basic project funding costs from the Commission. The new instruments (contract types) introduced with the launch of FP6 have altered this picture slightly, although the co-operative, multinational projects remain the core focus for funding.

The importance of R&D is written into the 1993 Maastricht Treaty. Article 163 states that 'The Community shall have the objective of strengthening the scientific and technological bases of Community industry and encouraging it to become more competitive at international level, while promoting all the research activities deemed necessary by virtue of other Chapters of this Treaty.' Other articulated goals included in the Treaty are:

- Promoting International R&D collaboration
- Establishing networks of SMEs
- Creating mechanisms to stimulate and support innovation
- Increasing EU wide human capital
- Building up knowledge infrastructure in less favoured regions and links to more advanced ones.

The establishment of these goals in the Treaty influenced the structure of the next Framework Programme (FP4) that ran from 1994 to 1997 and disbursed approximately 13b euros (although by no means insignificant, this is a small fraction of the regional policy budget). The sponsored themes included ICT, Industrial Technologies, Environment, Life Sciences and Technologies, Energy, Transport and targeted socio-economic research. FP5 had a slightly larger budget (approximately 15b euros) and targeted the following themes: quality of life and management of living resources, user-friendly information society, competitive and sustainable growth, energy, environment and sustainable development. Clearly, FP5 has a more 'green' character than the FP preceding it.

During the course of FP5, in 2000, R&D was signalled out as one of the vehicles by which to achieve the Lisbon objective of 'becoming the world's most competitive and dynamic economy by 2010.' This entailed creating a European Research Area (ERA) to integrate research efforts in Europe which up to that point were 'fragmented along national lines, with the result that efforts are duplicated and valuable resources wasted' (ESPON2.1.2, p. 52). To this purpose, the Barcelona Objective sought to increase investment in R&D in the EU to 3% of GDP by 2010, of which two thirds should come from the private sector (ESPON 2.1.2, p. 9). The next year, in Göteborg, the European Council agreed on a strategy for sustainable development and added a third, environmental dimension to the Lisbon strategy. This is also reflected in the criteria used to designate financing for projects in the FPs (European Commission, 1513/2002/EC). In the current and Sixth FP a distinction is made between the thematic priorities and a new topic called specific activities covering a wider field of research. The former include life sciences, genomics and biotechnology for health, information society technologies, nanotechnologies, aeronautics and space, food quality and safety, sustainable development, global change and ecosystems, citizens and governance in a knowledge based society. The latter topics include policy support and anticipating S&T needs, horizontal research activities involving SMEs and specific measures in support of international cooperation. These more long-term projects are likely to favour universities rather than private businesses (ESPON2.1.2, p. 171). The budget of the Sixth and current FP has been increased as well to 17.5b euro.

In 2003, guidelines for evaluating EU R&D policy were set up and implemented. In the subsequent evaluation of FP6 in 2004, an argument was made that not enough funding

reached SMEs and newcomers. This was taken on by the Commission in suggestions for 'corrective measures' to make it easier to apply and qualify for FP funding. Additionally, the Commission supported the statement that the scientific community needs continuity, implying that too many changes to the rules of the Framework Programme is likely to damage it (COM(2004) 574 final, p. 3). Finally, it should also be noted that FPs have produced little commercially useful technology, partly due to its aim of assisting in 'pre-competitive' basic research. The extent to which it contributes to the competitiveness of Europe is therefore disputed.

Factors of policy change

The basic structure of EU R&D policy has remained unchanged since the beginning of the FPs, but the Objectives have changed over time. Because European R&D policy involves the co-financing of research carried out by others, its power lies in the criteria used for funding which is subject to change every five years on average. This allows the EU to establish new targets as the political agenda changes; as a result, the EU can tailor its R&D policy to its sectors without a great deal of difficulty. This is powerfully illustrated by the Lisbon and later the Göteborg strategies. Therefore, R&D policy rarely conflicts directly with other sectoral policies – it does not in itself have a competing sectoral standpoint.

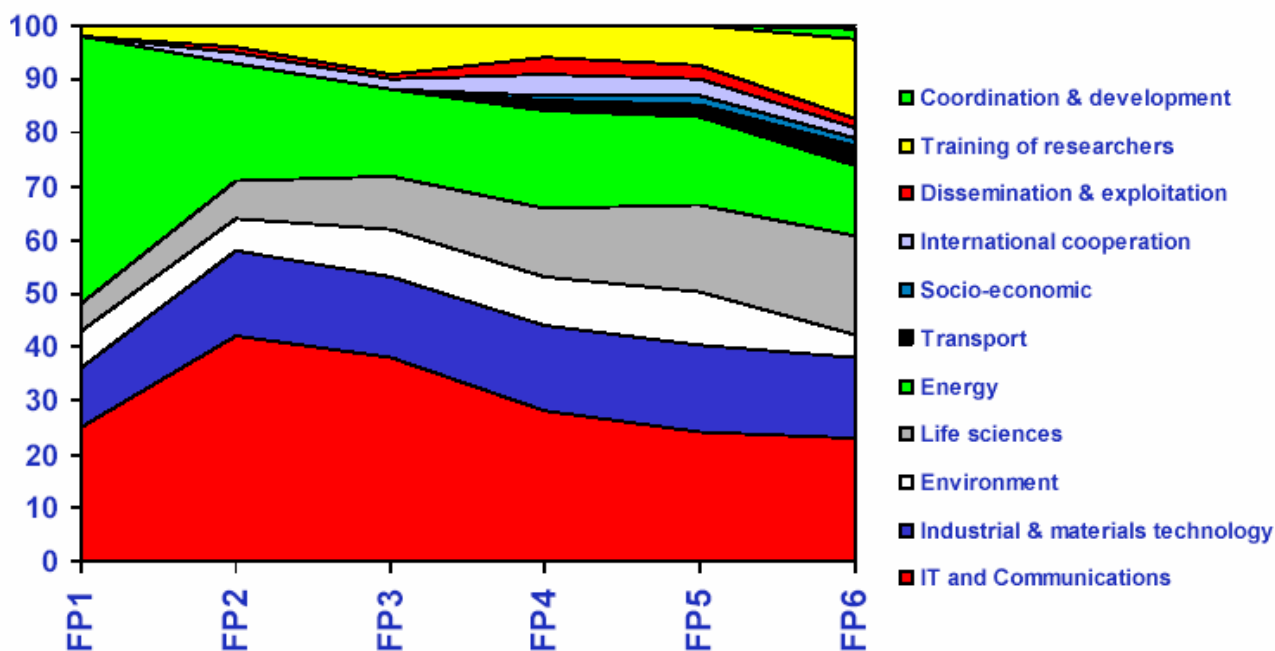
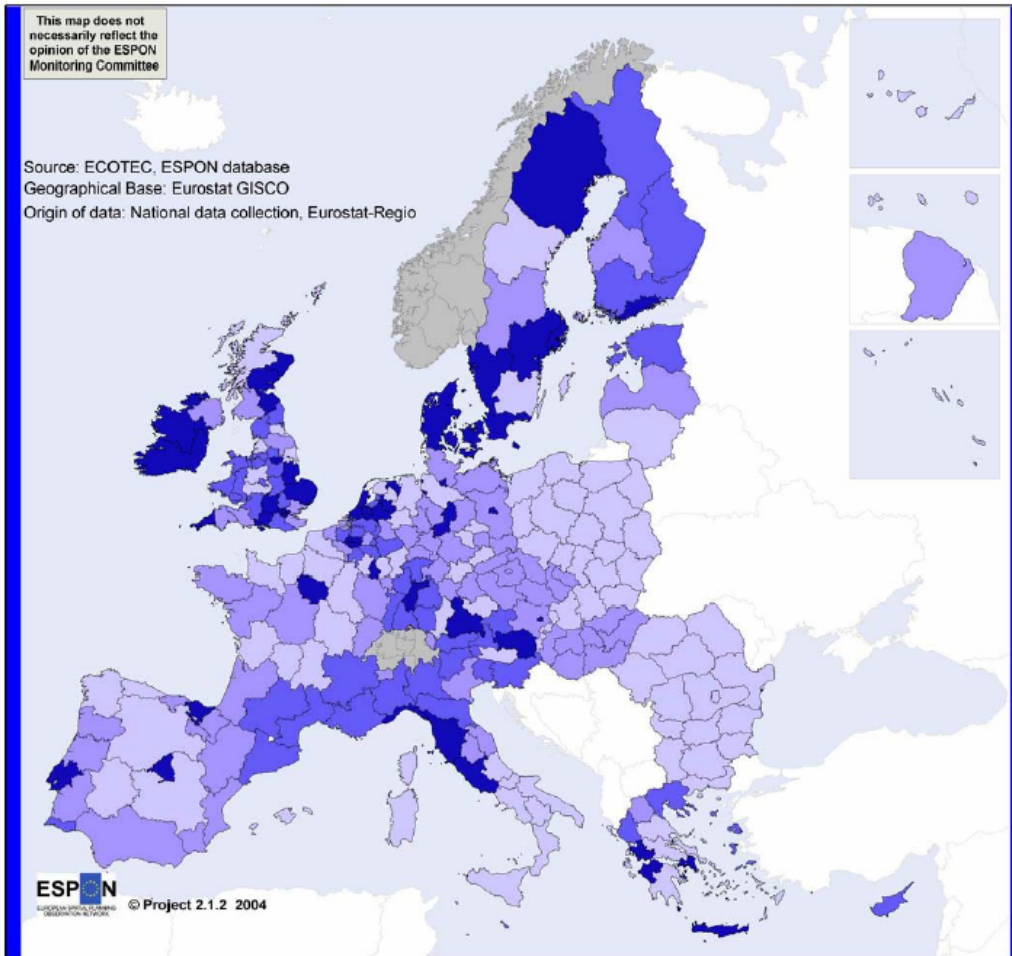


Figure 12 Sectoral distribution of FP spending

Relations between R&D policy and other EU policies

As stated above, *substantive* sectoral conflict with R&D policy is rare because objectives of other sectors can be designated as objects of subsidized research. For example, various EU transport-related issues were given funding under FP4 and FP5 (Robert et al, 2001: 58, 73). On the other hand, one can examine the effects of the geographical distribution of the *administration* of R&D policy in terms of other policies, particularly regional policy.



Total number of project participants in the Fifth Framework Programme weighed by population, 2000

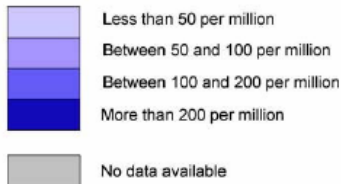


Figure 13 Total Project participants in the Fifth Framework Programme across the EU-27, weighted by population

From the map above showing the relative weight of FP5 recipients, it is clear that, by and large, countries in the Pentagon/Blue Banana and Scandinavia seem to be profiting from EU R&D subsidies. This does not reflect a significant shift from FP4 (ESPON2.1.2, p. 131). This picture stands in sharp contrast to that of regional policy support, in that more developed regions in Europe seem to be participating the most. Indeed, expenditure seems to favour regions with an already well-established R&D infrastructure on balance, but there is a clear ‘catching up’ tendency to discern as well. This will be discussed later in the section on territorial impacts.

Potentially the most important policy interfaces of EU R&D policy in terms of objectives are with regional policy (ESPON2.2.1, p. 25). Both of these policies have economic development as their primary goal, albeit R&D policy more with a means-based perspective. This

convergence of regional and R&D policy goals is intensifying in the next structural funds period, as the emphasis on international cooperation in the FP6 and the 2007-2013 structural funds period demonstrates. Cohesion through competitiveness is also a common goal. In fact, the proposed reform of regional policy is: 'designed to redraw the European solidarity landscape in an enlarged Union and in the context of economic globalisation and the development of a knowledge-based economy' (EC Factsheet on Regional Policy, 2004) – precisely the language included in the Lisbon strategy. An interesting difference between the two policy areas however is that while EU regional policy is very sensitive to the topic of spatial development (infrastructural connections, notions of peripherality, urban redevelopment), geography plays only a minor role in EU R&D policy. This is reflected in the lack of regional data, a matter emphasized by ESPON project 2.1.2 in its recommendations (p. 27). This subject of regional/R&D policy interface will be returned to in the next section.

Territorial effects of R&D policy

European R&D policy seems to be having a clear impact on increasing scientific knowledge. According to ESPON2.1.2, 'Technological capacity has been improved significantly through EU R&D Programmes.' According to an overview of impact studies supplied by the European Commission in its 2004 Competitiveness Report, the contribution of academic research was highest in the computer and pharmaceutical sectors, and lowest in metal, rubber and plastic products and textiles and paper (EC 2004b: 53). Most of the spatial impacts of R&D policy are not readily discernable however. The funding of various projects do not necessarily result in the development of new business parks or infrastructure. Much of what is gained is 'human capital' or 'network development' rather than physical change: 'perhaps the greatest effect of EU R&D policy is on the spatial diffusion of knowledge in Europe' (ESPON2.2.1, p. 172). An overview of the general impacts of R&D policy so far provided by ESPON2.1.2 is reproduced below.

| | <i>Macro-level</i> | <i>Meso-level</i> | <i>Micro-level</i> |
|------------------------------|--------------------|-------------------|--------------------|
| Infrastructure and equipment | * | * | *** |
| Technological capacity | ** | * | *** |
| Networking | *** | * | ** |
| Human capital development | ** | | ** |
| Employment | | | * |
| Governance and strategy | | | * |

The greater the number of "*", the greater the effects felt at this level

Source: ESPON2.1.2, p. 168.

Table 10 Spatial effects of different elements of R&D policy

This table shows that the more tangible results of R&D policy are generally felt on the micro-level while networking improvements are more discernable at the macro level. EU R&D policy was found to have relatively little impact at the meso level; there was only limited evidence of direct spillovers from FPs into the regions, although more indirect effects on the general profile of the region were discernable (ESPON 2.1.2, p. 24).

Since R&D policy, especially after Lisbon, is seen as key for improving the EU's competitiveness, it is important to examine the extent to which it contributed to this. An initial impression of the effect of these EU R&D efforts in this regard can be gained by examining the figure below (obtained from COM (2004) 29 definitief/2, p. 41). One can see

that most EU countries showed some increase in the percent of GDP being devoted to R&D in the 1999-2001 period, but that most still fell far behind that of US and Japan.

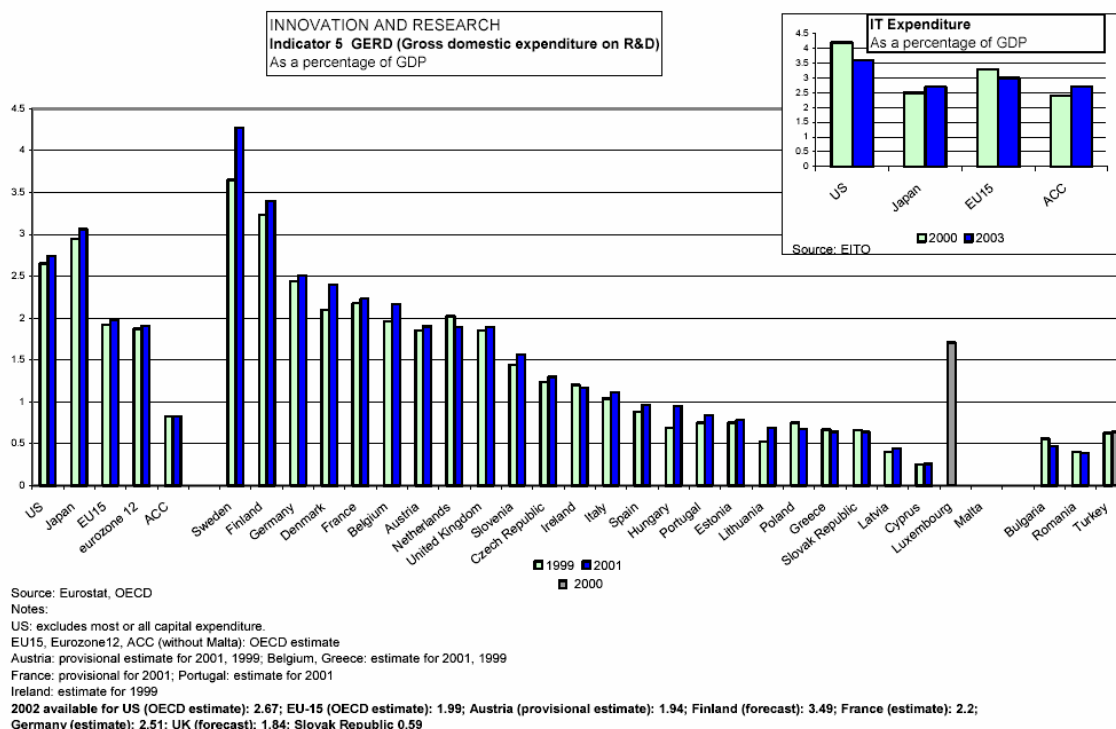


Figure 14 Gross domestic expenditure on R&D as % of GDP

By 2003, and in spite of the Lisbon goals, expenditure to promote growth in R&D in the EU was only 1.9% of GDP as opposed to the US with 2.8% and Japan 3% (Van Rietbergen et al, 2003, p. 156). With a mere 4% annual growth, it is therefore unlikely that the EU will achieve its Lisbon 2010 R&D targets without additional intervention (COM (2004) 29 definitief/2, p. 12). Moreover, from the figure below showing the relationship between employment and productivity, it is clear that the EU15 still has a long way to go to achieve the Lisbon objective for 2010 in general (Ibid., p. 8). Specifically, employment is not felt to be contributing sufficiently to economic growth (Ibid., p. 9).

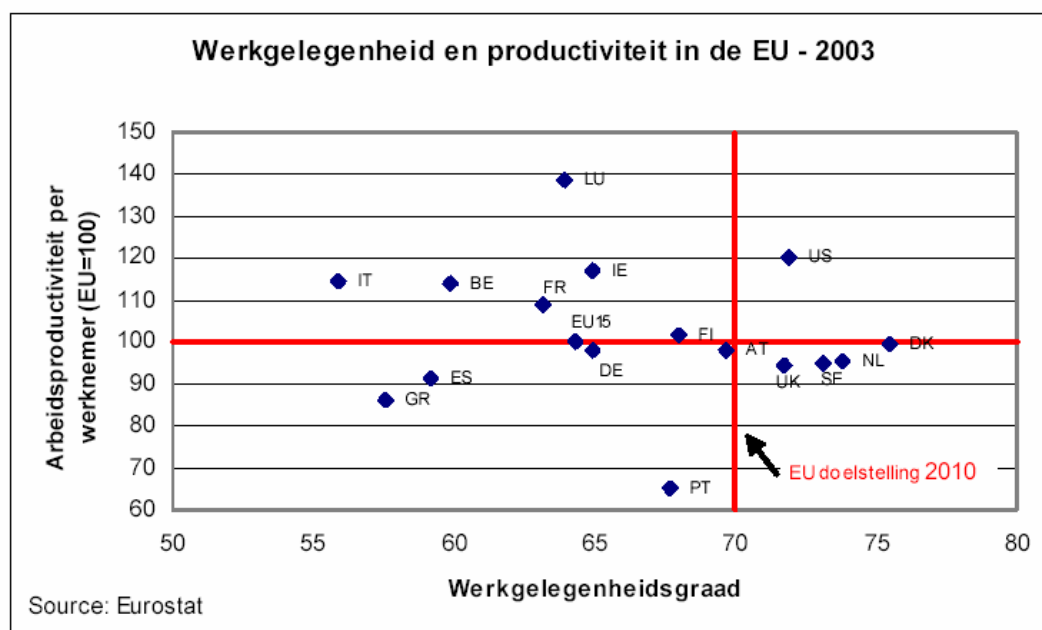
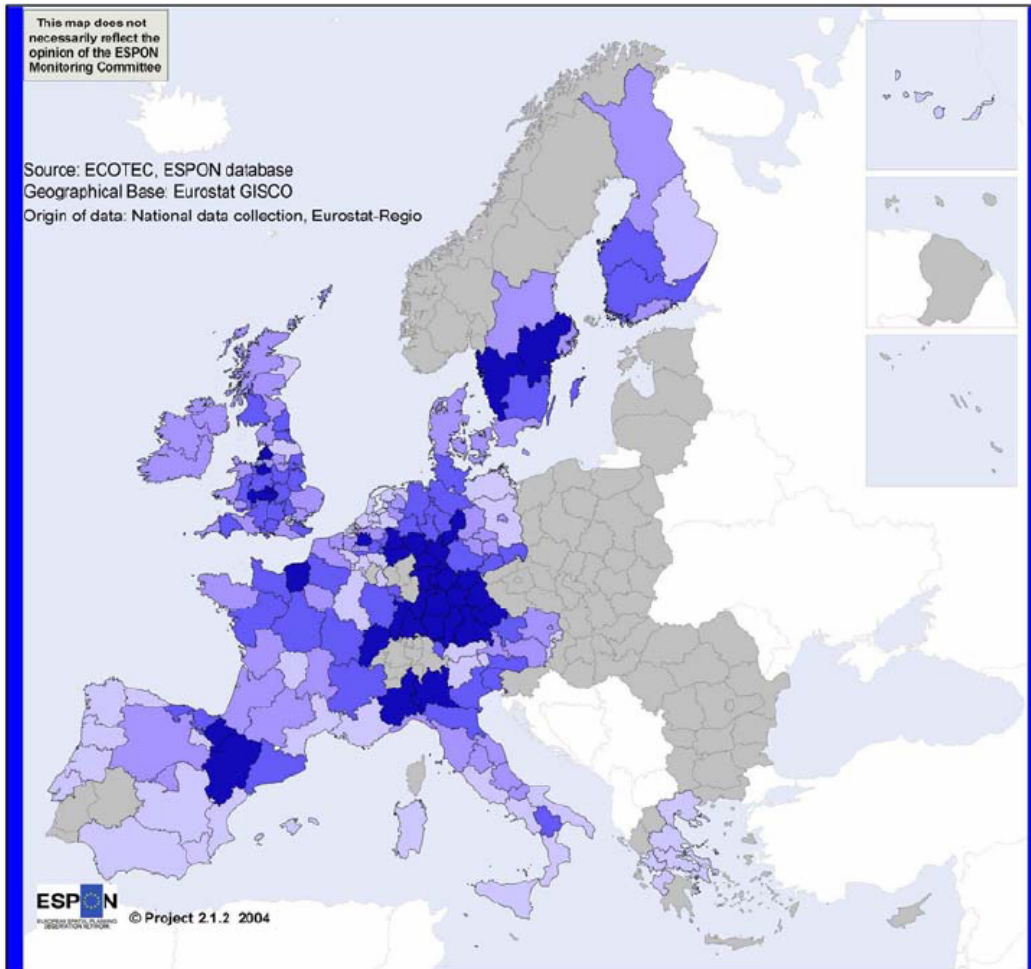


Figure 15 Relationship between employment and productivity in the EU (2003)

In addition to the effects R&D policy has had on economic growth, one can also consider to what extent it has aided or inhibited cohesion in Europe. As can be recalled from the map in the previous section, R&D funding on the whole is directed to other areas than regional policy. A reason for this mismatch in the geographical distribution of funding is explained in ESPON 2.1.2: 'in broad terms, the effects of the Framework Programmes are felt most strongly in the wealthy core regions of the EU, where R&D activity is concentrated. These regions attract more FP funding primarily on the basis of their existing academic and private research infrastructure, and the need to have a certain 'critical mass' to support the risks of involvement in potentially complex transnational projects. Existing regional strengths are thus a key factor in determining a region's propensity to benefit from FP funding' (p. 24).



Employment in medium-high and high-tech manufacturing (% of total workforce), 1999

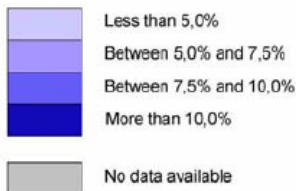


Figure 16 Employment in high and Medium high technology manufacturing sectors across the EU-27 for the most recent years for which data is available

This map of actual employment in medium and high tech manufacturing shows marked similarities with R&D investment in Europe, the most important being that core areas and Scandinavia seem to be most prominent. This raises the question of to what extent R&D and regional policies are reinforcing one another.

Looking at the way the policies interact in practice shows clear room for improvement. Despite a clear convergence in terms of goals, the administration of both policies are much less integrated. According to ESPON2.1.2:

There is little evidence of co-ordination between the two main strands of EU R&D policy (Framework Programmes and Structural Funds) at a regional level. Regional

Programming Documents for Structural Funds do not appear routinely to make reference to Framework Programmes, for example, and local technology transfer agencies in several regions studied did not promote FP participation, alongside access to Structural Funds (p. 24).

Despite this, and the fact that FP funding tend to be disbursed more outside Objective 1 areas than within, there are some encouraging signs of convergence. If one investigates this in terms of participation levels per unit of GDP, less developed regions tend to score better and give some indication of a 'catching up' process. Combined, FPs in the future may significantly contribute to polycentricity by supporting competitive nodes throughout Europe, including those in cohesion countries and the N12.

Looking forward, it seems reasonable to expect increased convergence of structural funds and FP within the context of the Lisbon agenda. Time is running out to bring R&D expenditure up to 3% of GDP and the approximately 20b euros for FP7 will be insufficient to leverage this.

2.4.1.4.3 Regional policy

Policy history

In the early years of European cooperation, most of the participating countries had roughly the same level of economic development overall, but not their regions. In order to live up to its commitment of providing a level economic playing field, Europe embarked on a regional cohesion policy to reduce these disparities. With the entrance of Britain to the Union in 1975, the problem of economic restructuring became apparent, and the European Regional Development Fund (ERDF) was established consequently. Later, with the inclusion of Greece (1981), Spain and Portugal (1985), income levels not just between regions but also between entire member states diverged. A cohesion fund was then set up to allow these countries to catch up. At the end of the 1980s, EU support via the regional funds was reorganised under the appellation the 'structural funds', from then on administered according to a programme of roughly five years.

During the first structural funds period (1989-1993) cohesion became included as one of the primary objectives of the union in the Maastricht Treaty, and was accompanied with a budgetary increase to ECU 68 billion (1997 prices). In the second structural funds period (1994-1999) the budget more than doubled. The third and current structural funds period (2000-2006) has the largest budget to date (see table below). Now regional policy represents over 35% of the total EU budget, second only to agriculture in terms of expenditure.

| EU Regional policy | Total budget for 2000-2006 period (in 1999 euros) |
|-----------------------------|---|
| Structural funds | |
| • Objective 1 | 135.90 billion |
| • Objective 2 | 22.50 billion |
| • Objective 3 | 24.05 billion |
| Community initiatives | 10.44 billion |
| Fisheries | 1.11 billion |
| Innovative actions | 1.00 billion |
| Regional funds total | 195.00 billion |
| Cohesion fund | 18.00 billion |
| Total | 213.00 billion |

Table 11 Total budget for the 2000-2006 structural funds period

Currently most (70%) EU funding is targeted at regions whose development is seen as lagging (Objective 1), another 11.5% is earmarked for economic and social restructuring (Objective 2) and 12.3% to promote the modernization of training systems and job creation (Objective 3). Community Initiatives (5.35%) address specific problems, including:

- cross-border, transnational and interregional cooperation (Interreg III);
- sustainable development of cities and declining urban areas (Urban II);
- rural development through local initiatives (Leader +);
- combating inequality and discrimination in access to the labour market (Equal).

The cohesion fund provides direct finance for specific projects relating to environmental and transport infrastructure in Spain, Greece, Ireland and Portugal whereas the Instrument for Structural Policies for pre-Accession (ISPA) provides assistance along the same lines to the ten countries that joined the EU in May 2004.

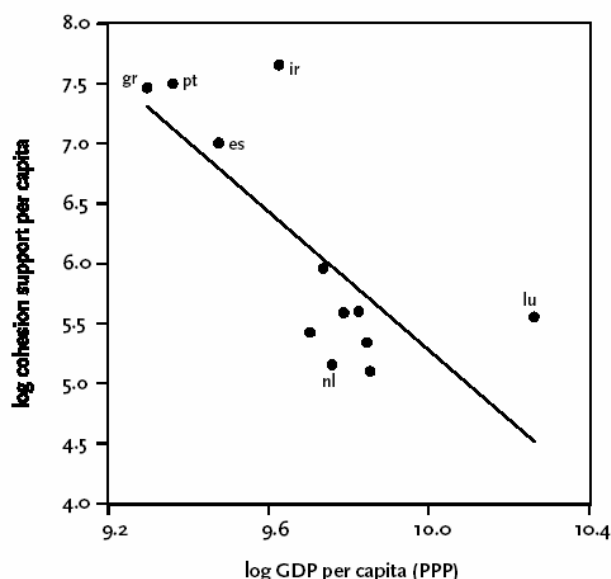
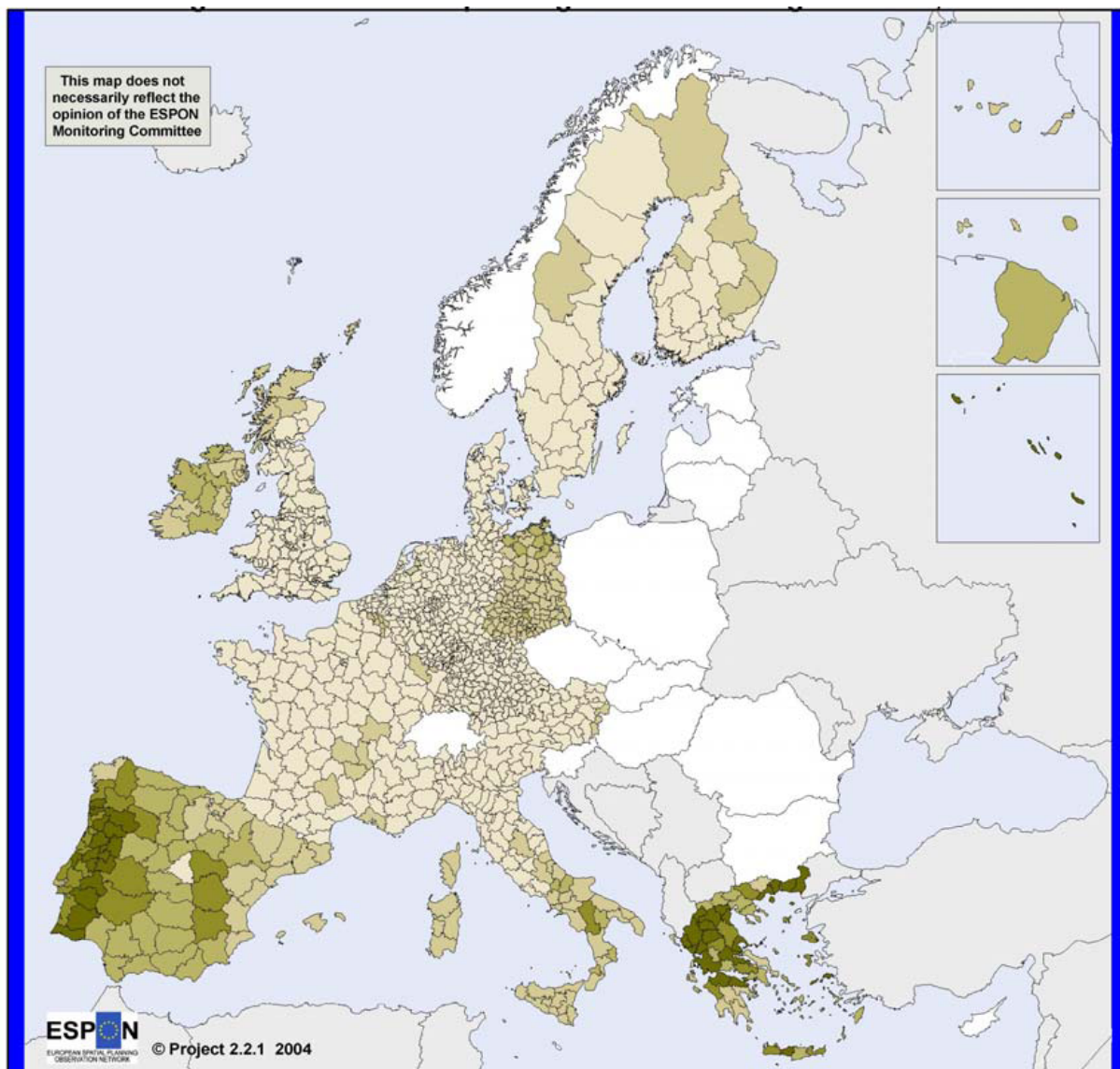


Figure 17 Income redistribution at a national level

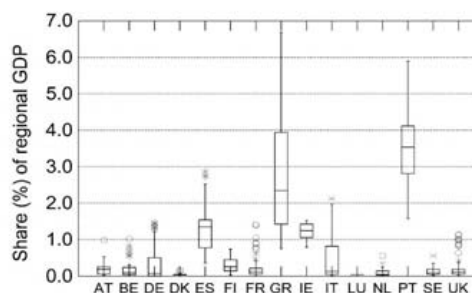
The figure above shows that contrary to criticism about 'pumping money around rich nations' the intensity of structural funds investment is indeed generally concentrated in the least advantaged regions of the Union. According to the analysts producing this figure, 'The slope of the regression line is -3. This means that a 1% increase in GDP per capita implies a 3% reduction in cohesion support per capita' (Ederveen et al, 2002, p. 17 cited in Van Ravesteyn and Evers 2004). The fact that poorer regions receive most of the aid is reconfirmed by the following ESPON map.



Annual average Structural Fund spending as a share (%) of regional GDP in Euro, 1999

- 0 - 0.4 %
- 0.4 - 1.25 %
- 1.25 - 2.0 %
- 2.0 - 3.0 %
- 3.0 or more %

Source: Nordregio, ESPON database
 Geographical Base: Eurostat GISCO
 Origin of data: National data collection, Eurostat-Regio



Source: ESPON2.2.1 Third Interim Report, p. 134

Figure 18 Annual average Structural Fund spending as a share (%) of regional GDP in Euro (1999)

A first statement on regional policy in the 2007–2013 period was made in the *Third Report on Economic and Social Cohesion*, published on 18 February 2004. Much of the attention of the report is devoted to ameliorating the disparities between the EU15 and N10. The most substantive change to the Structural Funds is the replacement of numbered Objectives with so-called Community priorities. Nevertheless, the priority ‘convergence’ resembles Objective 1 and is directed to the economic and social cohesion of regions in the EU. The priority ‘regional competitiveness and employment’ resembles Objectives 2 and 3 but with more stress being placed on the ideals articulated in the Lisbon strategy. Finally, space plays an enhanced role in the new report, with Urban, Equal, Leader+ and especially Interreg being elevated to the status of the Structural Funds Objective ‘European territorial cooperation’ (European Commission 2004). Again, as in all preceding periods, the budget is being increased substantially, to about € 384 billion. Although these increases may appear large, taken in terms of percent of GNP the change is more modest. The figure below reflects these relationships as well as showing the expected diversion of aid from EU15 countries to the NMS (European Commission, 2003).

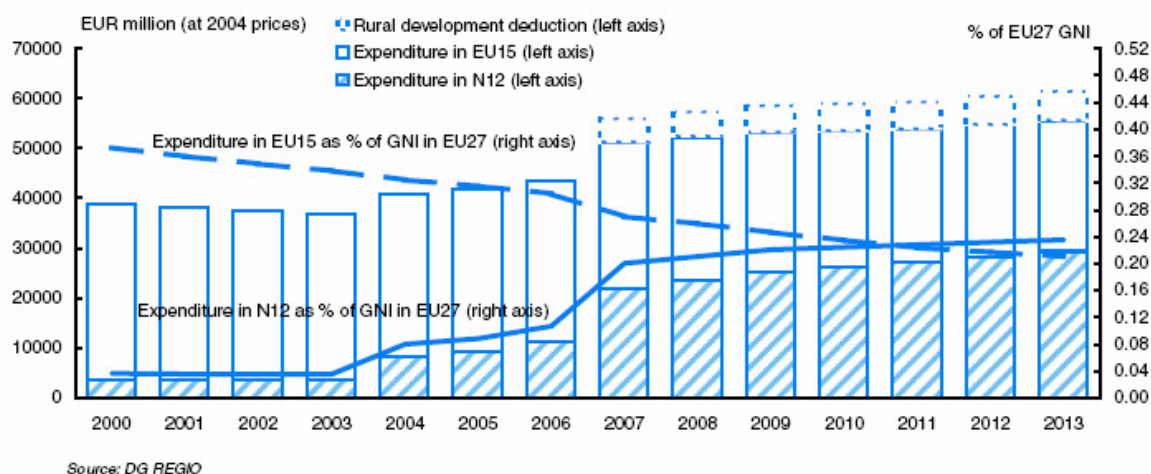


Figure 19 Expenditure on cohesion policy, 2000-2013

Factors of policy change

From the preceding chronology of European regional policy, it seems clear that one of the most important factors influencing the goals of regional policy has been the enlargement of the Union. The ERDF was set up with the entry of the UK and the cohesion fund with the entry of the southern Member States. Similarly, the negotiations leading up to the Third Cohesion Report were powerfully influenced by the 2004 enlargement. One difference is that this time, changes were not necessarily driven by the specific challenges faced by the new Member States, but also reflect concerns of existing Member States. The enhancement of the status of interregional cooperation to that of an Objective can be interpreted in this light as an attempt to allow an avenue for funding to remain open to the more affluent member states. Most of the other reasons for changes to regional policy are technical ones designed to increase their effectiveness or to create synergy with other sectoral policies.

Relations between regional policy and other EU policies

The goals of regional policy are diverse, and so are its interfaces with other policy activities of the European Union. With regard to its most important aspect, that is, to mitigate regional disparities, a few disparities with other Union policy goals can be noted. First, public support given to businesses in a particular region may violate terms of EU competition policy (particularly regarding state aid), which generally provides exceptions in such cases. Second, projects financed by regional policy, particularly infrastructural policy, may run counter to environmental goals. Rather than solving the congestion problem, for example, new infrastructure can encourage greater mobility, delivering at most a brief respite. More car mobility brings with it increased CO₂ emissions, noise and air pollution, and the construction of physical infrastructure can threaten natural habitats and despoil the landscape, which is hardly the intent of EU environmental policy (Minderhoud 1997; Kusiak 1997; Bruinsma et al. 2002 cited in Van Ravesteyn and Evers 2004). Moreover, rather than promoting cohesion, infrastructure financed by regional policy funds may actually intensify regional disparities by exposing vulnerable markets to competition and allowing local resources to drain away (Committee on Spatial Development 1999: 15; Vickerman et al. 1999; Hajer 2000; Ederveen et al, 2002; Peters 2003 cited in Van Ravesteyn and Evers 2004). Third, diverting EU funds to disadvantaged regions rather than stronger regions with economic potential can be viewed as a less efficient means to achieve the Lisbon objective of becoming the most competitive knowledge-based economy in 2010. On the other hand, regional policy does seem to have produced clear-cut improvements in connectivity and accessibility at scales (ESPON 2.2.1). In addition, the modifications to the CAP policy, particularly the shift from Pillar 1 to Pillar 2 subsidies brings it more in line with the goals of regional policy. Heretofore CAP funding was often channelled to more affluent parts of Europe (see EC 2003: xvii and ESPON 2.1.3).

One statement about the combined effect of regional policy and other sectors is found in ESPON 2.2.2 about the impact of pre-accession aid.

Overall, the analysis demonstrates that many elements of the *acquis* are in line with territorial and spatial development themes e.g. accessibility and connectivity, environmentally friendly and sustainable development. The adoption of the *acquis*, therefore, has the potential to influence territorial development issues by addressing (directly or indirectly) regional potential and bottlenecks, e.g. through the promotion of integrated pan-European transport and telecommunications networks, the development of structures for the implementation of future Structural Funds and the introduction of a more unified industrial policy (p. viii).

These points are made more explicit in the table below:

| Chapter | Spatial Cohesion | Spatial Competition | Spatial Integration | Regional /territorial impact review |
|---------------------------|---|--|--|--|
| Agriculture | Rural development funding Guaranteed standard of living and income for agricultural communities | Increased productivity Multi sectoral integrated approach to rural economy | Market Unity Promotion of rural linkages and connectivity | Rural regions Lagging rural regions (eastern border regions) Countries with high percentage of agriculture, e.g. Poland and Romania. |
| Environment | Support for environmentally disadvantaged regions Supported for protected regions | Improved quality of life - link to development of competitiveness Improved environmental infrastructure | EU neighbourhood policy Cross-border cooperation | Heavy industrial/polluted regions Improved environmental services for urban region Vulnerable habitats |
| Transport Policy | Potential to addresses transport bottlenecks to regional development | Improved competitiveness through improved infrastructure and transport services | Cross-border linkages | Urban centres as transport nodes Capital cities, linked through TENs Increased internal integration |
| Regional Policy | Support for lagging regions and cohesion countries | Emphasis on regional competitiveness, innovation and R&D | Cross-border cooperation | Support for lagging regions and cohesion countries |
| Competition Policy | State aids to lagging regions | Removal of market barriers | Freer movement of labour (though currently restructured) | Support for lagging regions Negative impacts of migration Growth in most competitive regions |
| R&D | Support for R&D and innovation provide through structural funds New development potential for heavy industrial regions | Development of high tech zones and growth poles | Cooperation between Member States through framework measures | Well endowed urban centres, through higher tech, innovative companies also have the potential to be more 'footloose'. |
| Internal Market | New development opportunities and markets for regional economies | Free market CEE regions can compete with EU-15 for investment and business | Freer movement of persons | The most competitive regions - capital cities and western border regions |

Table 12 The Acquis/Community policies and territorial goals

On the other hand, in its study of the effects of regional policy in urban areas, ESPON2.2.3 found that structural funds did support measures 'with a physical planning orientation' but that 'these interventions (in infrastructure, regeneration, transportation, buildings put to new uses etc.) are motivated for their role in economic development of the urban area and, in some instances, by their importance for social inclusion. There is no strong environmental focus, apart from the fact that encouraging a sustainable development is a horizontal aim'

(p. 104). Therefore, we can see that there may be a mismatch in goals and effects with respect to synergy between policy sectors.

Territorial effects of regional policy

The effectiveness of the structural funds is a topic of a long and complex debate. Examples of some of the various positions and arguments against regional policy found in Van Ravesteyn and Evers (2004) are presented below. As a review of the literature on this topic is obviously beyond the scope of this policy scenario base, we will focus attention on ESPON results and the Third Cohesion Report.

Since the introduction of the regional policy, economic disparities between Member States have notably declined, yet they have remained about the same between regions, and actually increased within Member States (de Vet and Reincke 2002). This strange development leaves much room for interpretation. Although evaluations by the European Union have been (unsurprisingly) positive (e.g. European Commission 2001a: 30), there are some who argue that regional policy has had little or no effect (de Mooij and Tang 2002). Others are even more pessimistic, arguing that the Structural Funds work counterproductively. These authors claim that regions will eventually converge as a result of general economic development and that the cohesion policy, by dampening this through reallocation, can inhibit this natural cohesion process. Other arguments against the deployment of Structural Funds are that:

- they crowd out private sector investments instead of stimulating them;
- they reward Member States for neglecting regional disparities in their own countries;
- the bureaucratic burden of the rules imposed in the allocation of funds dampens economic stimulation;
- political manoeuvring has created a 'money go round' in which many funds circulate among wealthier Member States;
- deploying regional funds for new infrastructure can lead to environmental damage and expose sensitive economies to fierce competition.

In short, the Structural Funds, stretched by attempts to obtain political support for the EU among the wealthier Member States, are accused of having become an unwieldy and ineffective instrument for achieving economic and social cohesion and potentially causing environmental damage – not to mention generally violating the subsidiarity principle.

There are two main ESPON reports that directly address the impact of regional policy, ESPON 2.2.1 on the territorial impact of the structural funds, ESPON 2.2.3 that examines the role of structural funds in urban areas, and to a lesser extent ESPON 2.2.2 that examines the impact of pre-accession aid to the 10 NMS.

According to ESPON 2.2.1, 'Structural Fund programmes have had tangible net economic impact in the Cohesion countries and other larger Objective 1 regions. Outside these areas, economic impacts are difficult to quantify' (p. 273). This is also largely the message contained in The Third Cohesion Report, which states that European regions have been converging in the 1994-1999 period, particularly in cohesion countries (EC 2003, p. ix). In many urban areas, structural funds have been earmarked to mitigate disparities along ethnic lines and to address specific urban 'pockets of deprivation', resulting in marked improvements in the quality of life in these areas (ESPON2.2.3, p. 77), although it is difficult to tell whether this concerns the same inhabitants as before the intervention. It is difficult to assess the total effect of structural funds in urban areas however due to the lack of explicit mention of the urban dimension in regional policy programmes (beside of course Urban I and II and Objective 2 financing directed at cities in the current period).

More specifically, ESPON2.2.1 noted that the greatest effects of the structural funds on polycentric development regarded functional/economic specialization, connectivity accessibility/transport, and strengthening international cooperation (p. 24). Interestingly, diminishing regional divergence scored less prominently, as did distribution of population. In addition, tangible results in physical development in urban areas included support to sport and leisure facilities and infrastructure (foot and cycle paths). This kind of support was less prominent in areas where deprivation existed on the outskirts of urban areas, such as in Naples. Structural funds were also used to bolster urban connectivity by improving public transport systems (ESPON2.2.3, p.77). This is displayed in the table below.

| Geographical level of influence/effect | | MICRO | MESO | MACRO | SUM | TOTAL SUM |
|--|----------|-------|------|-------|-----|-----------|
| Type of influence/ effect | | | | | | |
| Aspects explicitly targeting polycentric development | Direct | | ↔ | ↔ | ↔ | |
| | Indirect | ↑ | ↑ | ↔ | ↑ | ↔ |
| Distribution of population | Direct | ↑ | | | ↔ | |
| | Indirect | ↑ | ↔ | | ↔ | ↔ |
| Functional/economic specialisation | Direct | ↑ | ↑ | ↑ | ↑ | |
| | Indirect | ↑ | ↑ | ↑ | ↑ | ↑ |
| Connectivity/accessibility /transport | Direct | ↑ | ↑ | ↑ | ↑ | |
| | Indirect | ↔ | ↑ | ↔ | ↔ | ↑ |
| Strengthening of international co-operation | Direct | ↑ | ↑ | ↑ | ↑ | |
| | Indirect | ↑ | ↑ | ↔ | ↑ | ↑ |
| Diminishing regional divergence | Direct | ↑ | | | ↔ | |
| | Indirect | ↑ | ↔ | ↔ | ↔ | ↔ |
| SUM | | ↑ | ↑ | ↔ | | |
| ↑ = aspect influenced by Structural Funds ↑ = some Structural Funds influence ↔ = hardly any influence of Structural Funds | | | | | | |

Source: ESPON 2.2.1

Table 13 Structural funds influence on polycentric development

ESPON 2.2.1 also makes an interesting point that, ‘not only the direct implications of programmes and spending are of importance, but increasingly also the indirect effects of programme management and government have similar effects’ (p. 75), a finding echoed by Van Ravesteyn and Evers (2004) in their examination of the effect of regional policy on spatial developments in the Netherlands.

Looking ahead and taking the changes in policy and territorial effects into consideration, there could potentially be a divide between the EU15 and N10, as reflected in the figure displaying levels of finance above, which could translate itself into different kinds of territorial effects. Whereas regional policy in the N10 would include major contributions to physical projects such as infrastructure development, we can expect that the effects in the EU15 will be softer, such as improved networks produced by EU incentives for cooperation.

2.4.1.5 Future trends

Among the several trends, observable in the European economy, we selected four for closer examination. These are of a general, not a spatial character. Spatial trends are regarded as repercussions, consequences of more general economic and social processes and will be examined closer in the framework of the scenario drafts. The four that will have ample spatial impacts are the following:

1. The trends of globalisation and internationalisation of the European economy
2. Ageing and rising dependency ratios
3. The development of Information and Communication Technologies
4. Technology and increasing income gaps in European society

2.4.1.5.1 *The trends of globalisation and internationalisation of the European economy*

In the last decades, the expansion of international trade and international investment far outpaced the growth of output and income. Opportunities have expanded for two reasons. First, technical improvements have led to significantly lower transport and communication costs. Second, successive multilateral agreements have significantly brought down the barriers to trade. While in 1930 the average ad-valorem import tariff for manufacturing was 21% in Germany, 30% in France and 48% in the United States, after the Uruguay Round in 1994 it fell to 4.8% for the European countries and 3% for the United States. In 1820, world exports represented only 1% of world production. This measure for openness increased to 9% in 1913 and to 17.2% in 1998. Clearly, countries have become more integrated into the World economy during centuries. But this has not been a continuous process. With the Great Depression in the 1930s came an era of protectionism in which countries raised import tariffs and countries became less, rather than more integrated.

European integration has contributed to the internationalisation of European economies. Since the Treaty of Rome, Europe has gradually deepened its economic integration, widened its competences and enlarged its membership to a club of 25. Intra-EC trade and investment flows illustrate the achievements of European integration. The share of intra EC-trade as percentage of all EU exports grew from 37% in 1958 to 56% in 1980 and to 61% in 1998. The share of intra-EC investment flows as percentage of total European FDI almost doubled during the last two decades.

What are the prospects of further integration?

The WTO has succeeded in removing a number of major trade barriers in manufacturing, while the Single Market Programme of the European Union has gone beyond that by removing technical barriers of trade. This does not imply that integration cannot proceed much further. National borders still exert a large impact on trade. According to some research findings (Brewer et al. 2001) the trade between regions within the same country is about 80 times more intense than is trade between two regions which are in two different countries. The creation of a single currency in the European Union may help to make borders less important as barriers of trade – an effect that has not yet fully materialised. Bilateral trade flows halve when distance is doubled and decrease by roughly 80% when the languages of the two countries are different. This indicates that transaction costs are still important barriers of international trade. It also suggests that the process of international economic integration has further prospects.

There are, however, also uncertainties concerning the further liberalisation of world trade. This is especially due to the more heterogeneous membership of the WTO, which leads to a wider variety of interests. Moreover the agenda contains more difficult areas such as agriculture and services while, at the same time, the agenda of free trade is linked to non-trade issues. One of the uncertainties for the future is whether the WTO negotiations will eventually come to a successful conclusion.

The other major uncertainty is the volatility of international financial markets. Today huge flows of money move across the globe and react to even the smallest differences in profitability. Although not every country has access to international capital markets and arbitrage is still imperfect, the mobility of international financial capital is indeed fairly high. This gives rise to two issues. First, capital owners in developed countries evade taxes by allocating a significant amount of their funds in tax havens. To reach an agreement on information exchange and/or a source tax on interest income is extremely difficult even within the European Union and even more difficult in a wider circle of countries. This can lead to major disturbances in government finances.

A second issue is that the flows of short-term capital can suddenly change direction and lead to wild fluctuations in exchange rates. Recent years have shown a number of prominent examples. So far, the IMF was unable to find a cure for debt-ridden countries and collapsing currencies, which fuels the critique on its legitimacy.

2.4.1.5.2 Ageing and rising dependency ratios

Ageing is related to the temporary hiccup in European birth rates after the Second World War and a structural decline in fertility rates thereafter. When the baby boom generation retires in the next ten or twenty years, the share of the population above 65 years will be much higher than it is today. This ratio is expected to increase in all industrialised countries. In particular, whereas for every pensioner there are roughly four workers in 2000, there will be only two in 2035. Hence, the old-age dependency ratio will more or less double in this period.

Even though ageing affects all developed countries, there are significant differences in pace and degree of ageing. Southern Europe will age faster, and after 2025 will have a higher old-age dependency ratio than France and Germany, where it will stabilise around 2030. If the dependency ratio in new member states is now lower than in old member countries, it is not because of a more balanced age structure, but because of the higher – and in the last decades increasing – mortality in the age of 50-65. People die before becoming really old. Should this situation change, new members would have the most unfavourable dependency ratio.

But ageing is first and foremost a problem of distribution between young and old generations. It has arisen with the introduction of Pay-As-You-Go systems. In such a system the working generations pay taxes to finance the old-age benefits of the retired generations. The PAYG systems were introduced in many countries (in all the new member countries) to give older generations a decent income. A PAYG system is a social contract between older and younger generations. If the age structure of the population were stable, no serious problems would arise. But the age structure of the population will change substantially during the coming decades. In the absence of increase in productivity, the tax burden of the young working generations will rise, sometimes dramatically. The increment falls into the range of 3-5% of GDP in the majority of EU countries.

The problem of an increasing tax burden on young working generations is reinforced by another factor: namely increasing public expenditure on health care. Health care expenditures have already significantly increased in the past decades. Demographic

changes explain only a part of this historical increase of health care expenditures. The other explanation is that sectors of relatively low potentials for productivity increase – like health care – must raise their relative price level and their share in income, employment and production. Considering that old people ‘consume’ the most part of health care services, the increment of health care because of ageing and other factors will be in the range of 1-3% of GDP between 2000 and 2030.

The increasing public expenditures on old-age benefits and health care (together 4-8% of GDP) will put a significant pressure on society. First, an increasing tax burden would put a strain on the social contract between young and old generations. Second, a higher tax burden on the young would exacerbate distortions in the economy. They could induce behavioural responses by individuals to avoid them, e.g. by working less hours, investing less and consuming untaxed products. These responses erode the tax base and give rise to a downward vicious circle.

2.4.1.5.3 *The development of Information and Communication Technologies*

Regarding the economic impact of information economy and knowledge society the following *trends* can be ‘extracted’:

The growing importance of knowledge for the economic development will accelerate the structural change of the economy in the EU (and elsewhere). *New, knowledge-based sectors*, e. g. bio-, nano-, material- and ICT, will significantly influence the economic growth and the raise of productivity, whereas the ‘*old*’ *branches* will undergo either a deep restructuring or a decline in the course of globalization pressure. The structural change is accompanied by and its economic success depends on policy reforms which set incentives for a prosperous development of knowledge-driven sectors.

The impact of the knowledge society to a large extent does not result from few high tech sectors, but more from the *use of the advanced technologies*, developed in the leading high tech-branches, *in all sectors of the economy*. ICT and other advanced technologies will undergo a broad cross-sectoral diffusion process. However, this diffusion will require the combination of investments, e.g. in ICT, with fundamental organizational changes. These organizational changes concern the intra-firm relations as well as the inter-firm relations and the firm-customer relations (e. g. e commerce), and probably the implementation of these organizational changes might be more costly than the investment itself. It can be expected that large firms will be more capable to implement the organizational changes than small ones.

The structural change, induced by the knowledge society, *requires high and permanently renewing skills of the workforce*. The growing economic importance of a number of knowledge based sectors will go along with a growing proportion of the workforce employed in knowledge related economic activities. The acquisition and retention of top researchers towards/in Europe is a necessary requirement, when it comes to the production of new knowledge and its economic use. However, skill requirements are much broader, they include more or less all branches and professions. Against the background of an ageing population in Europe life-long learning will become a pre-condition for coping with the challenges of the knowledge society. Advanced technologies, e.g. the use of ICT for telelearning will create new opportunities for training and qualification.

Both the production of new knowledge and its diffusion and use across all sectors of the economy require strong ties between research institutions and businesses. So far as the innovation process is concerned, spill-over of non codified ‘tacit’ knowledge will be of growing importance for the economic success of the innovator. Spill-overs of tacit knowledge typically requires spatial proximity of the partners (universities, research institutes, businesses). However, as far as codified knowledge as a pre-condition for

production is concerned, spatial distance doesn't matter. ICT creates new opportunities to distribute information and (codified) knowledge over large distances in a few seconds.

The use of ICT as an essential knowledge based technology will create growing opportunities to modernize the public sector too. E. g., e-governance creates new opportunities for the rationalization of administrative procedures and it will create new chances to improve democracy and to mobilize citizens' initiative.

As *key drivers* behind the trends can be identified the following:

- globalisation of the economy
- progress in ICT
- technological achievements in other high-tech sectors
- fundamental policy reforms towards a 'knowledge and research-friendly' environment

2.4.1.5.4 Technology and increasing income gaps in European society

During recent decades low-skilled wages have lagged behind high-skilled wages in a number of countries, while the unemployment rate among the low-skilled has risen more sharply. This divide between skill levels may intensify in the coming decades. Changes in technology – especially the widespread application of ICT – could raise the demand for skilled workers while the supply of skills will be flattening. Together, this would raise the skill premium, thereby increasing income inequality.

During the 1980s and 1990s, the United Kingdom and the United States experienced a notable increase in income inequality. One could see this as a typical phenomenon of Anglo-Saxon culture, where a relatively large divide between rich and poor is socially accepted. However, not only in these two countries do we observe that high-income groups saw their income increase faster than low-income groups.

One important factor behind the changes in income inequality is the skill premium. Over the years, the average time spent on education has increased substantially and the labour force has become much better skilled. As a result, the supply of high-skilled workers shows a secular increase relative to the supply of low-skilled workers. Wage inequality could have been even worse if the supply of low-skilled and high-skilled workers had remained constant during the recent decades.

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2.4.2 Scenarios

2.4.2.1 Logic of scenario selection

For such huge, multifaceted and complex systems as the European economy and European spatial development an infinite number of development scenarios can be outlined and described. The four scenarios described below represent four of these infinite possibilities. They have not been selected randomly; they have a systemic relationship to each other. This is because, when developing scenarios, it is important to make the different alternative futures distinct from one another, immediately identifiable and plausible.

1. The scenarios are ordered according to an **analytical logic**. A proven method is to use a dual axis system: by drawing two perpendicular lines signifying a continuum of a particular variable, four distinct scenarios can be created.
2. Their selection is based first of all on **economic** concepts, relationships and theories. It was, however, unavoidable to touch upon political, social and other issues of development as well, but the fundamental factors are economic.
3. Their selection is based on **practical experiences**, which could be observed in Europe and in other parts of the World. Obviously, none of the four possible scenarios can be observed in the pure theoretical form, but there were periods and there are countries and regions in great number, whose development path can be identified – to a lesser or larger extent – with one of the scenarios described below.

The scenarios that will be created are of the prospective policy type. This means that the independent variable is EU policy. For this reason, much attention will be paid to the decision to adopt a particular kind of policy strategy, the various measures implemented to this end, and, finally, the impacts these will have on social and economic cohesion and spatial development. Because the intent is to examine the effects of different policy directions, as many ancillary variables as possible will be held constant. In all scenarios it will therefore be assumed that globalisation, that is the ongoing intertwining of international networks and economic relationships, will continue to increase. In addition, the rise of the knowledge, information or creative-class economy, as discussed at length in the scenario base, will also be assumed to continue in each scenario.

A few remarks also in order regard the selected axis-system methodology. Ideally the typology created by the axes would exclude all reference to specific policies as these are continually modified, and exclude any notion of success or failure since this would clearly give a priori biases regarding desirability: this must be discovered after conduction of empirical research, rather than assumed beforehand. In addition, high and low economic growth or varying degrees of globalisation should not constitute an axis since these matters are established and resolved in the scenario base. For this reason, we can assume that for all scenarios the knowledge economy will play an important part in shaping European economic performance, and that the current globalisation tendencies will continue. For this reason, clear directions in policy with significant impacts on the spatial development of Europe will comprise the content of each axis.

These two axes have not been selected arbitrarily. In fact, the underlying rationale for this choice can be found in the European Union's own approach to its economic development. Perhaps the best statement regarding the ambitions of the European Union in terms of the

economy can be found in the Lisbon/Göteborg strategy to become by 2010 *'the most dynamic and competitive knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion, and respect for the environment.'* This dual emphasis on efficiency/competitiveness on the one hand and equity/cohesion on the other comprises the underpinnings for the two scenario axes (we have chosen not to include sustainability/respect for the environment as an independent variable in our analysis). Furthermore these two axes are conventionally positioned against one another as a simple trade-off, but we will show that they are better viewed as dimensions that are not necessarily mutually exclusive. Before presenting our scenario sketches, this method will be elaborated further with a brief description of the two axes.

2.4.2.1.1 Axis: Equity and cohesion (horizontal)

Over the past few decades, regional policy became one of the most important policies of the European Union, and now represents over 35% of the Community's budget expenditures. Undoubtedly, the EU's economic and social cohesion objectives have played a very significant role in some countries' development. But beyond the policies and instruments of the EU, one has to consider policies with similar objectives in the member states. Though with different intensity and with different financial resources, member states also wanted to mitigate internal social, economic and territorial disparities in development and income. EU and national 'cohesion type' policies have played a decisive role in Europe's development in the last half century.

The formulation and implementation of equity considerations and cohesion policies were, however, always accompanied by criticisms and debates. Criticisms became louder especially in recent years. Cohesion policy has been made one of the scapegoats for not achieving the original Lisbon objectives. The debates on the future of cohesion policy are related, on the one hand, to the future dimension and resources of these policies: what share of Community investment should be spent on these purposes, what should their share be in the Community budget? On the other hand, the orientation of cohesion policy is also debated: who and what should be supported? Should it be restricted to infrastructure, environment, education and culture — as many experts suggest — or should it be extended to the support of job-creating business enterprises as well? How large a circle of countries and regions should benefit from cohesion measures? Should cohesion support be limited in time?

The horizontal axis of the system of coordinates represents the equity and cohesion dimension. But the place of a particular policy mix along this axis depends not only on the size of financial means available for cohesion and social equity purposes. It depends also on the importance, attached to these policies, on being more targeted, concentrated and on their system of delivery.

2.4.2.1.2 Axis: Efficiency and competitiveness (vertical)

The traditional equity-efficiency continuum is combined in this context with the concepts of cohesion on the one hand and competitiveness on the other. Indeed, competitiveness has become the key notion in the economic policy of recent times. It includes not only economic efficiency, but innovation, marketing, flexibility, structural change and risk management as well. Several recent studies have demonstrated that Europe's lagging behind the US in GDP per capita is less attributable to productivity per working hour, and more to the fewer working hours per person employed, lower employment level, lower level of innovation, the smaller share of fixed capital accumulation, lower expenditure on R&D, the small amount of

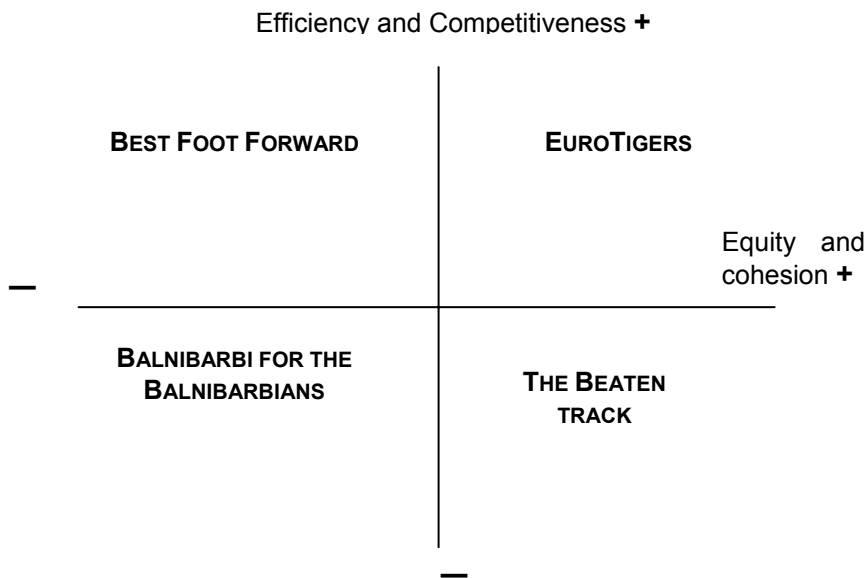
venture capital, high taxes and finally low labour and capital mobility. To achieve improvements in all these areas, substantial changes have to take place in microeconomic and macroeconomic policies, in the system of welfare services and in governance methods and practices. All these are included in the dimension of the vertical axis representing efficiency and competitiveness.

2.4.2.1.3 Visual depiction of scenario logic

The four segments of the coordinate system, divided by the two axes, represent the four scenarios of European economic policy developments and their spatial impacts. The four segments represent:

- High efficiency/competitiveness — low equity/cohesion (Best Foot Forward)
- High efficiency/competitiveness — high equity/cohesion (EuroTigers)
- Low efficiency/competitiveness — low equity/cohesion (Balnibarbi for the Balnibarbians)
- Low efficiency/competitiveness — high equity/cohesion (The Beaten track)

These scenarios are *prospective policy scenarios*, because they explore the impacts of changes in some important national and community priorities. The dimensions of the axes represent the importance and priority of individual policies. Their measurement by exact quantitative indicators is rather difficult though we shall try to quantify them. They are — to a certain degree — holistic scenarios, because they comprise impacts on several aspects and spheres of economy and society, though impacts on other important spheres of life remain unexplored.



To facilitate the analysis, three of the most important — competition, regional policy and R&D policy — will be considered in more detail in the scenarios. In so doing, it is important to note that both of these policies undergo periodical revisions rather than continual adaptation. Since the 1980s, regional policy has been defined by 'structural fund periods', and R&D policy by consecutively numbered Framework Programs. At the end of each term,

the policy is evaluated and modified in order to increase effectiveness, adapt to changed circumstances or to achieve different policy goals, making the transfer date significant. It should be stated that these periods are roughly five years, but have different starting dates so that they do not necessarily run parallel to one another. An indication of how the periods interrelate, helping the scenario-building, is presented in the table below.

| | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 |
|----|------|------|------|------|------|------|------|------|------|------|------|
| SF | | | 1 | 2 | 3 | 3 | 4 | 5 | 6 | 6 | 7 |
| FP | | 1 | 2/3 | 3/4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

Table 14 Envisioned Structural Funds and Framework Programme policy periods

Naturally, the scenarios are much more complex than this duality. The economy of Europe is impacted by various policy sectors, such as agriculture, competition, transport and the environment, which cannot always be placed unambiguously within the dimensions of equity and efficiency.

2.4.2.1.4 Territorial impacts of scenarios

Since the ambition is to enter the economy scenarios in the MASST model, only certain qualitative and rather guarded statements can be made here regarding *expected* results. These will have to be borne out later by the quantitative results. In addition, although the regional economic impacts will be the primary point of attention, interfaces with other territorial areas will also need to be addressed. These include demography (i.e. migration), environment (quality and change in policy), transport (congestion and model split), and rural areas (functional change, vitality).

2.4.2.1.5 Organisation of scenario sketches

Since the four scenarios are prospective policy scenarios, the emphasis is on the driving forces leading up to the decision to adopt a particular strategy, the specific package of policy measures designed to implement it, and its effects. To aid readability and comparability, each scenario sketch is organised identically, according to the structure presented below.

1. Scenario hypothesis
2. Driving forces
3. Developments and events (story line)
4. Contextual elements
5. Strategy
6. Implementation
7. Impacts
 - a. Aggregate macroeconomic impacts
 - b. Other impacts
8. Territorial image of 2030
9. Summary and conclusions

2.4.2.2 Economy Scenario I: Best foot forward

This scenario describes a situation where the EU pursues a strong policy in favour of economic competitiveness. Well-performing regions and sectors are bolstered in order to allow them to achieve an internationally elite status in the global knowledge economy. Matters of cohesion and sustainability are secondary.

2.4.2.2.1 Scenario hypothesis

As indicated in the scenario base, the economic competitiveness of Europe is seen as increasingly tenuous in a context of rapidly developing Asian competitors, a dominant North American block that continues to attract the best knowledge workers, conflicting sectoral policies, outdated social welfare systems and looming ageing of the population. Following the publication of the Kok report on the discouraging progress of the Lisbon strategy in late 2004, it is clear that drastic measures need to be taken to reverse the trend towards stagnation (EC, Facing the Challenge, 2004). It is also acknowledged that a clear gap currently exists between Europe and Japan and the United States in levels of investment in R&D, which is seen as an important indicator for the relative position in the knowledge economy. The scenario assumes that the level of globalisation will continue to rise in terms of market liberalization (WTO), movement of labour (knowledge workers) and capital (footloose industries). In addition, the scenario excludes the possibility of a major collapse of the world economy through war, disease, natural disaster or market failure, assuming that global trade will continue to rise. The importance of the knowledge economy for the European economy is also taken as a given for the coming period.

The basic hypothesis of this scenario is that efficiency considerations will gradually dominate European and national policies. Europe consequently follows the objective of catching up with the US and the Far East in respect to competitiveness and growth. The rate of investment will be increased and investment will go mainly to high-tech and competitive sectors of the economy. Institutions, regulations and policies which are regarded as obstacles of competitiveness and catching-up, will be revised and reforms serving growth and competitiveness will be implemented. Other government expenditures will be restricted, which will have an impact on social, employment, environmental and cohesion policies. Simultaneously, business environment will be improved: corporate taxes will be reduced, new entries into the market will be facilitated, and excessive regulations (e.g. concerning employment) will be reduced. State aid will mainly support R&D and innovation. The obstacles of the mobility of capital and labour will be reduced, taxation will be harmonised in a relatively low level.

2.4.2.2.2 Driving forces

Since all scenario sketches have policy as the main independent variable, 'driving forces' represent here the factors which put pressure on the policy arena to maintain, strengthen, modify or abolish a particular policy strategy. The main driving forces of this scenario are the ambitions of the Lisbon strategy coupled with the publication of disheartening progress reports thereof, effects of European expansion, globalisation and increasing pressure from international competitors in the knowledge economy. These will be considered in turn.

- **Private entrepreneurship** is a main driving force. Agglomeration economies and 'tacit knowledge' in the main centres of knowledge and innovation, are utilised by big transnational private enterprises. Simultaneously, these enterprises will outsource those activities which do not need to be located in these centres and can best utilise

the cheaper production factors of more peripheral areas. The role of national government and the EU will primarily consist in 'enabling' and facilitating the free movement of labour and capital. Economic growth will be the most dynamic in this scenario, having 'spread' and 'backwash' impacts simultaneously. The central area will exert substantial attraction force towards potential highly skilled migrants from the periphery inside and outside the EU. On the one hand, it will enable some transfer of income and knowledge to less developed areas, on the other hand, it will drain the most skilled and enterprising people from less developed areas, threatening seriously the latter's potential to catch up in development.

- **Critical reports:** the sobering 2004 midterm review by the High Level Group chaired by Wim Kok placed Lisbon once again at the top of the European agenda. The conclusion was clear: 'The Lisbon strategy is even more urgent today as the growth gap with North America and Asia has widened, while Europe must meet the combined challenges of low population growth and ageing. Time is running out and there can be no room for complacency. Better implementation is needed to make up for lost time' (quoted in COM (2005) 24). Meanwhile, there is evidence, from ESPON among others, of the problematic and sometimes counterproductive functioning of CAP.
- **Enlargement:** while the effects have not yet been felt, the incorporation of ten new members with a GDP per capita just of 46% of the EU25 figure will have profound impacts for EU sectoral policy (particularly CAP and regional policy), which could place an unwanted strain on the EU budget, compromising efforts for boosting competitiveness.
- **Globalisation:** the ongoing opening of international markets (WTO) further exposes Europe to its competitors, heightening the imperative for achieving the Lisbon objectives. As knowledge becomes capital, competition will increasingly take the form of attracting and securing the best knowledge-intensive industries and workers.

2.4.2.2.3 *Developments and events (story line)*

In June 2005, the European Council principally approved the financial perspectives and the regulations of Structural and Cohesion Funds for the period 2007-2013. For the first time in the history of European integration, this budget allocated significant funds not only to agricultural and cohesion objectives, but also to objectives such as growth, innovation and competitiveness. The new 'Competitiveness for growth and employment' fund was the most dynamically increasing item of the EU budget, nevertheless, its share remained modest (20 %) related to total expenditure even in the last years of the programming period. These funds were not sufficient to accelerate growth in Europe, especially if they were not accompanied by parallel measures of national governments. This fact was signalled as early as 2005 by the president of the Commission, but by 2010, the originally set target date of the Lisbon programme, it became quite obvious.

The decisive change in economic policies occurred between 2010 and 2014, during the preparation of the next programming period. Governments, especially those of the larger and wealthier member states, realised that, if they wanted to prevent a fatal lagging behind of Europe, they had to implement radical policy measures.

The next financial perspective, for the period 2014-2020, reflected these radical changes. The share of agricultural expenditures ('Preservation and management of natural resources') decreased to less than 15 percent of the EU budget. The budgetary share of cohesion policy decreased radically – to 25 % -as well. More than half of the EU budget became allocated to the objectives of promoting overall European competitiveness and growth (to the R&D sector, to promote business infrastructure, etc.).

European governments also took steps to facilitate the emergence of an efficient and productive economy. Publicly provided welfare provisions was limited to social assistance. Insurance against labour market risks was reduced and partly shifted to the market and social partners.

Despite the radical reduction of the resources of European Cohesion policy, the Eastern member states – as a whole – converged gradually to the European average. This happened because rapid institutional reform and a catching up of technology took place also in these countries. Indeed, there was a dramatic surge of foreign direct investment flows into the Eastern regions of Europe. As a result, European Cohesion policy, starting from 2020, was abolished at all.

Member countries arrived to an agreement concerning harmonised taxation only in the early 2010s. Accordingly, old, big member countries lowered radically their tax rates, while new members raised them moderately. In sum, this resulted in an overall tax reduction in Europe, which raised the competitiveness of European firms, but restricted the budgetary manoeuvring space for governments substantially.

Competition within the European economy substantially intensified from the early 2020s. Flexibility rose at the expense of commitment in economic relations. Free trade in agriculture and services was fostered. This called for substantial restructuring in Europe. For instance, agricultural sectors with little added value contracted significantly. The same happened to textiles in a number of countries. Although this entailed substantial changes, European economies became sufficiently flexible to cope with these changes.

In the meantime, a radical enlargement of the European Union and especially of the European Economic Area took place. In 2007, Romania and Bulgaria, in 2012, with a new 'big bang', all countries of the Western Balkans became members of the European Union. The main driving forces of enlargement were economic and political factors. European enterprises required new markets for their products and markets for secure investments. They wanted new and cheap labour for their new plants and outlets. On the other hand, they wanted stable political environment for the European economy. In the 2010s Switzerland and Norway joined the Union without difficulty. In 2020, Turkey, the Ukraine, Moldova, Armenia, Georgia and Azerbaijan became members of the European Union. In the same year, the EU signed free trade agreement with Russia, all former Soviet republics in Central Asia, with the countries of the Maghreb, Mashreq and the Levantine coast. In 2030, a European Union of 700 million inhabitants and a European Free Trade Area of 1,2 billion people, became a decisive factor in the World economy. But even so, they represented only 7,6 and 13 percent of the World population, respectively. The Far East, Japan, China, Southeast Asia and India with 3 billion inhabitants and with a rapidly growing economy had become serious competitors on the World markets. Hence, the European Union, the United States and Latin America agreed upon a 'backdoor free trade' agreement in 2025. The transatlantic economic integration actually had gone beyond a free trade agreement: it led de facto to a single market in which a large number of formal and informal barriers to trade were removed through mutual recognition. This holds in particular for the service sectors. This significantly fostered growth in the ICT sector in Europe.

2.4.2.2.4 Contextual elements of the decision to place Europe's 'best foot forward'

As stated, in this scenario the tenets of the original Lisbon strategy, to become the most competitive knowledge-based economy in the world, constitute the main point of departure. The break occurred in 2005. At that time, midterm reports published the previous year stressed that the present course was insufficient to meet this goal. After a rather unambitious and pragmatic Dutch presidency, which concentrated on 'cutting red tape' and

managing daily operations following the enlargement and completion of the Draft Constitution, the political climate in Europe seemed ripe for a more visionary course.

In the context of questionable growth in economic competitiveness, the enlargement is particularly problematic. Most new member states are hardly competitive even within the context of Western Europe, let alone with Asia and North America. This will be exacerbated by the entry of Bulgaria and Romania in 2007. There is a growing apprehension among the more affluent members that the political weight of the new entrants in the Commission and Parliament may result in more emphasis on redistribution. This is evident on an individual level with measures such as restricting migration from the N10 and the phased implementation of CAP in the new member states, and some elements (more prominent role for Lisbon in the *Third Cohesion Report*) of regional policy. By 2005, there was a growing awareness among core member states that they must band together if a programme of economic competitiveness is to be preserved: akin to the 'Europe of two-speeds' discussion the year before. For this reason, some cohesion-oriented policies will have to be sacrificed.

Core countries conspicuously espousing the 'best foot' philosophy include the United Kingdom, Austria, the Benelux, Sweden and Finland – and particularly the business sector in these countries. Sympathisers but not overt proponents include France and Germany as both countries contain some elite regions, but also some clearly lagging ones as well (Britain, despite the fact it clearly has lagging regions, also has a more liberal tradition than Continental countries). Countries such as Italy are divided on the issue, whereas Ireland, Spain, Portugal and Greece are opposed on economic and ideological terms (all have experienced the benefits of cohesion policy). Although the strategy will not benefit all regions equally, the citizens of Europe seem convinced of its necessity: according to the 2004 Eurobarometer Report, for example, 'European public opinion is ready for solutions in order to foster growth and address crucial issues like unemployment or the future of pensions' (EC, *Eurobarometer on Lisbon Agenda*, 2 Feb 2005). Public opinion also shows that a 'vast majority' believes that a knowledge-based society is the best way to deliver this.

2.4.2.2.5 The 'best foot forward' strategy

Employing a 'back to basics' argument, the coalition successfully pushes through a programme to realise Lisbon by concentrating its resources on its main assets. There is already some indication of support for this in the wake of the conclusions of the midterm review of Lisbon: 'Lisbon's overburdened list of policy objectives has obscured the importance of these actions which can drive productivity growth' (COM(2005)24, p. 13).

The strategy entails massive injections of funds into technology development, education in hard sciences, support for ICT infrastructure and the like in order to bridge the investment gap between EU and Japan and the US in terms of per capita GDP (both public and private investments). The 'best foot forward' is an intensely pro-EU strategy, as the European level will be relied on to deliver many of the changes via regulation and financial support. It is also emphatically Europhilic in nature as it wishes to champion the best aspects of Europe, allowing the EU to act as a beacon for the best minds on the globe.

Since the ultimate goal is to attract and retain the world's best human capital in the knowledge economy, additional investments will be required to further enhance the quality of facilities and amenities in Europe's most competitive regions. This means that the

European Union must 'ensure that our universities can compete with the best in the world' (COM(2005)24, p. 9). Already some specific measures are being proposed such as the creation of a European Institute of Technology (ibid.). However, the 'best foot forward' strategy goes further: funds must be directed to disseminating an image of Europe's elite universities as a unified alternative 'ivy league' rather than an archipelago of excellence, as they are now commonly perceived. Educational credentials are standardised and streamlined throughout Europe, and rankings published regularly. The most successful institutions are rewarded with 'EU top' status, entitling them to additional funding and other benefits. The latter include, for example, preferential treatment in land-use conflicts regarding their physical expansion, relaxation of immigration laws in order to draw top professionals and students, and programmes for benefit packages (subsidised travel and housing schemes) for students and staff. Additional funding would be earmarked towards research facilities and networking activities designed to attain spillovers.

Since the central regions (Pentagon) are currently the main driving forces and carriers of Pan-European growth and competitiveness, most of the investments will be directed to these areas. These are also the regions with the highest level of 'creativity' as understood by Florida (2002). EU subsidies will therefore be provided for improved infrastructure in the Pentagon (to counteract congestion) and to dynamic companies and organizations (universities) engaged in the knowledge economy. Information and resources will be pooled in order to construct a powerful MegaEuroRegion with the critical mass to attain and remain at the top of the world knowledge economy. In order to finance this, the structural funds will be increasingly directed towards the objective defined in the *Third Cohesion Report* 'Competitiveness for growth and employment', and will be explicitly tied to the Framework Programmes for stimulating R&D. Related to this, the budget of DG Research will be increased substantially, and tied to supporting programmes that contribute to economic competitiveness. On the other hand, CAP funding will be reduced dramatically. Aggressive competition policy will also be pursued to ensure that labour, goods and services are allowed to flow freely in Europe, on the assumption that this will further enhance the competitive position of top locations. In addition, spatial measures are taken to improve the attractiveness of the core area of Europe (or at least offset some of the negative spatial consequences of economic development) for knowledge workers (Florida, 2002).

Finally, globalisation is harnessed to launch knowledge-intensive firms into the 21st Century by means of proactive stimulation packages. Measures include selective tax cuts, information production and sharing schemes, selective migration policies, and exemption from certain (e.g. environmental, labour market) restrictions. Policies target large organizations with proven success or certain dynamic sectors such as information technology.

2.4.2.2.6 Implementation of the strategy

This section will provide a short summary of the various interventions into strategic decisions and sectoral policies that are required to realise the strategy outlined above.

- **EU budget.** In this scenario, the taxing potential of national governments will be seriously restricted and this will have an impact on their willingness to contribute to the community budget. National contributions to the community budget will be reduced to 1 percent of GDP, or even below this level in longer term. The structure of the expenditures will gradually, but in the long run substantially, change. The share of agriculture and cohesion policy will be substantially reduced, while the share of expenditures under the heading 'Competitiveness for growth and employment' will

substantially increase. The share of R&D and of external policies will also increase and private sector R&D will be encouraged via tax credits.

- **Agriculture:** as CAP subsidies do not promote economic competitiveness in a knowledge economy — indeed agriculture is viewed in this scenario as increasingly archaic and irrelevant — the budget will be reduced substantially (the enlargement has added urgency to this, as the N10 include many poor agricultural areas). Pillar 1 support is abolished entirely, and Pillar 2 subsidies are granted to areas in which they will produce maximum amenity in top locations.
- **Competition:** one of the main aims should be to make the Single Market more dynamic. It means better coordination between regulatory and competition policies to encourage market access for new entrants and to introduce a more pro-active policy to support labour mobility. State-aid regulations will be lifted for certain kinds of industry, particularly knowledge-intensive small business start-ups; this was the thrust of the Communication 'Working together for the Lisbon Strategy' (COM(2005)24, p. 8). On the other hand, state aid should be strongly discouraged if it interferes with or inhibits private-sector investment (see EC, *EMAC Speech Neelie Kroes*, 3 Feb 2005). In addition, the EU has to remain vigilant that promotion of elite organisations and sectors does not stifle healthy competition, and therefore existing anti-trust legislation and rules on public procurement will remain vigorous. This scenario also calls for intensifying the freedom of movement of jobs, labour and capital in Europe, as it is estimated that 'completion of a single market in services should lead to an increase in the GDP level by 0.6% and of employment level by 0.3% in the medium-term' (COM(2005)24, p. 29).
- **Enlargement** will progress dynamically in this scenario. The West Balkans, Turkey and perhaps the Ukraine will be members already in the late 2010s and, perhaps, further countries will join the EU (Belarus, Moldova, some countries of the Caucasus, some Maghreb countries) in the 2020s. The main motives of enlargement will be to increase the market and political considerations: to ensure a stable political environment for the European economy. The heterogeneity of the European Union will further increase. The political resistance to enlargement by the more affluent member states will dissipate with the knowledge that Community resources are being directed primarily to elite areas, rather than cohesion. The new entrants, denying the aid received by other new member states in the past, orient themselves towards benefiting from the common market.
- **Environment and nature:** insofar as environmental directives may harm competitiveness, exemptions are provided. Particularly the Framework Directive on Water and Natura2000 will be relaxed in areas in which it is difficult to meet standards without incurring great costs. Similar selective implementation/repeal will apply to air, soil and water quality and noise pollution. If possible, however, the EU will compensate elite areas for these costs in order to maintain environmental quality.
- **R&D:** this is viewed as one of the most vital spearheads for the Lisbon strategy. Budgets of the Framework Programmes are increased dramatically, infused by links to the structural funds and CAP reductions, allowing the EU to meet and perhaps even exceed Lisbon targets of 3% of GDP (and bringing it in line with Japan and the US). According to the Commission, for example, 'an increase in the share of R&D expenditures in GDP from 1.9% to 3% ... would result in an increase of 1.7% in the level of GDP by 2010' (COM(2005)24, p. 29). As it is acknowledged that R&D is just one aspect of the knowledge economy, the activities of DG Research will be adapted to support other forms of innovative research as well. In fact, the Commission arrived at this conclusion as well: 'by far the largest productivity effect comes from the absorption of the results of foreign R&D' (EC, *2004 European Competitiveness Report*, p. 10), rather than being the source of this R&D. A similar conclusion was

drawn empirically for the Netherlands by Raspe *et al* (2004). At any rate, the theme of FP6 (Information Society Research) could be carried on into the future in this scenario. As a result of relevant policies, R&D investments undergo a considerable increase (the 3% objective, set up by the Barcelona summit, was reached in the meantime) and, what is not less important, these investments show a growing efficiency. Tax credits will be introduced to enhance R&D investments in the private business sector, particularly for start-ups. In general terms, the approach at the EU and national level to boost investment in R&D undergoes a paradigm shift, away from subsidies which are designated to subsidize a priori certain key technology towards creating a general R&D friendly environment, in combination with a competition-based system of funding for the best research ideas. Although the process of speeding up productivity growth is very complex and goes far beyond ICT, the latter doubtless shapes an essential ingredient on this path towards higher productivity. The significant increase in spending for R&D in combination with a growing efficiency of these investments will allow to make European high tech sectors more competitive, and a number of European high-tech industries will become world-wide leading in terms of front-end technology and economic success. Among the beneficiaries, promoted by the newly established EASR, primarily are the high-tech clusters in highly agglomerated spaces inside and outside the European Pentagon, where a critical mass of universities, research institutions and firms of relevant industries is already given and where intensive collaboration between them (to transmit the [tacit] knowledge) does already work and must not be created 'artificially'. The initiatives to increase and more effectively use R&D investment will go along with initiatives to improve the skills in line with the requirements of the emerging knowledge society. First priority is given to policies which create better conditions for the attraction and retainment of top research personnel towards/in Europe. Fast-track working permissions for non-European top-researchers as well as non-bureaucratic visa regulations will facilitate the attraction of the 'best brains' towards Europe. Complementary reforms aimed at an improved funding of universities, particularly on favourable remuneration conditions for top researchers, will be supportive when it comes to the attraction of urgently needed top personnel for R&D. Moreover, reforms of Europe's educational system, particularly at the university level, will come into force, allowing more competition among universities to attract the most talented students and scholars. At the European level, regulations will be introduced for the mutual recognition of qualifications and for mutual granting of the entitlements foreseen in the different national social security systems. These latter topics were even mentioned in the so called Kok report in the middle of the first decade (2004) as remaining obstacles for an intra-European exchange of well educated researchers (see Facing the Challenge [2004]: p. 20). The above described policies in the field of university education and research will create a strong competition among the universities where some of them will come up as 'elite universities'. As a result of these developments with respect to the education system, Europe will re-gain its attractiveness as a location for the 'best brains', and moreover, the reforms at the university level will lead to a relatively broad supply of highly educated 'knowledge-workers'. This class of well-educated people will enjoy high incomes and good employment chances. For the highly qualified workforce the capability to use advanced ICT is 'standard', while people with low skills, who earn only low incomes, are excluded from the benefits arising from ICT. Thus, Europe continues to show signs of digital divide.

- **Regional policy:** the Structural Funds will remain important, but will be increasingly employed strategically towards supporting initiatives that facilitate the creation and maintenance of elite regions. Funds to assist innovative firms in areas with dense knowledge networks are included in regional policy under the motto 'linking innovative potential to geographical advantage'.

- **Transportation:** congestion on roadways and rail in top regions is to be expected, given the additional economic activity. Member states must ensure that this will not undermine community investments by investing in mass transit solutions, (underground) road bypasses and multimodal transport.

2.4.2.2.7 **Impacts**

Since the ambition is to enter the economy scenarios in the MASST model, only certain qualitative and rather guarded statements can be made here regarding *expected* results. These will have to be borne out later by the quantitative results.

a) Aggregate macroeconomic impacts

Overall economic growth is expected to be the highest in this scenario. The expectation is that the successful implementation of the 'best foot forward' will produce a moderate change in overall economic growth, resulting from improved competitiveness of a limited number of businesses and institutions. More than direct subsidies, the relief given as a result of reduced payments via Pillar 1 will be noticed by consumers in the form of reduced prices. The loss of vitality in rural areas will create additional migration to urban areas, a source of inexpensive labour.

b) Other impacts

With regard to **rural development**, agriculture will enjoy in this scenario significantly less support and protection than at present. The share of CAP in the community budget will be substantially reduced. Consequently, rural areas will undergo a fundamental transformation. Agricultural production activity will be concentrated to those farms and those areas, where competitive production can be practised. These are mostly larger farms where the geographic, soil, climatic and hydrological endowments are favourable for agriculture and where markets are easily accessible. In other areas, full-time agricultural production activity will be radically reduced, even abandoned, the land will be used — in favourable cases — for environmental, recreational, and other non-agricultural purposes. The two types of land use will be separated not only at micro level but sometimes at regional level as well. It means that in some regions rural employment opportunities will be radically reduced. This will occur, first of all, in the new member states of Central and Southeast Europe (the present share of agricultural employment is 20-30% in Romania and Poland) but also in some Mediterranean countries. These people will look for new employment first of all in the urban centres of their own country, but also in the European core area. Many more will remain, however, and become even more disadvantaged. The overall decrease in rural population will be substantially smaller, because many urban residents will move to rural areas near the urban centres, in order to enjoy a more pleasant and healthy environment.

In terms of **transport** flows, the probable impact of 'best foot forward' is a rise in traffic volumes between the most important urban areas in Europe. Congestion of the roadway network may lead to the continued growth in air travel via regional (suburban) airports and better utilisation of the high-speed train network, which is geared towards linking important urban centres. Whether the improvements in infrastructure are sufficient to offset the expected growth in transport in the Pentagon is uncertain. More certain, however, is the continued lack of accessibility of peripheral areas.

With regard to the **environment**, it is to be expected that this scenario is hardly sustainable. Waivers of environmental rules entail the acceptance of more intense levels of

pollution, and the low priority given to this area and Natura2000 in general will most likely translate itself into reduced environmental quality in the Pentagon. More peripheral areas may notice little change, as work continues to be created elsewhere.

The spatial-economic changes will also be reflected in demographic development. Institutional obstacles to **migration** within the EU will be removed and efforts will be made to overcome other obstacles to labour movement (in terms of the standardisation and acceptance of diplomas, overcoming the language barrier, etc). Consequently, a relatively large flow of migrants will arrive to the core areas of Europe. These migration flows, however, will be substantially different from those of the 1960s and 1970s (unskilled or low skilled guest workers from the Mediterranean, Maghreb, and Turkey) and also from those of the 1980s and 1990s (asylum seekers from the poorest and war-ridden countries of the world). A large part of the new immigrants will consist of highly skilled, professional people. The knowledge-based economy aimed at in Europe will require in ever-increasing numbers this type of labour force. This demand will increase at a higher rate than the educational system and the number and learning capacity of the new generations will be able to satisfy it.

The present composition of immigrants is still different from the type described above. They are — in most countries — less skilled than the native population and more frequently unemployed. Nevertheless, if, on the one hand, welfare systems will be reformed, and, on the other hand, European development aid to third countries will be more effective, these measures will — hopefully — generate other type of migration movements than the present ones.

2.4.2.2.8 Territorial image in 2030

As its name implies, the 'best foot forward' will benefit those regions that are currently capable of sustaining top universities, major financial institutions, research facilities and the like. At present, this points to the Pentagon, although obviously not all regions in the Pentagon qualify (e.g. the pockets of poverty in rural areas like Northern France), while some particularly strong nodes outside (e.g. Scandinavia) do. The net effect of this scenario will be a net increase in territorial disparities at the macro level (the central MegaEuroRegion versus the periphery) and the meso level (major cities versus smaller ones), and in that sense can be seen as anti-polycentric. However, since overall economic growth is expected to increase in 'best foot forward', increasing disparities do not mean necessarily the stagnation or decline of relatively lagging behind regions. It can mean growth, albeit less than the average growth rate, but growth nevertheless. But undoubtedly, there will be regions in which absolute decline will occur.

In this scenario regional disparities are therefore expected to increase both between and within countries. Economic disparities are expected to increase among countries because knowledge based and research-intensive activities would generate the highest income and these activities are expected to increase faster in the core area, where resources for research and innovation are most available. Paradoxically, intensive outsourcing of activities to less developed areas would not reduce but rather increase disparities, because it enables to use labour force in the core area for more productive, profitable and income generating activities.

The concentration of economic activities is expected to increase also within (certain) countries, because knowledge based and innovative economy will emerge first where geographic proximity and 'tacit knowledge' (transferable only by direct, personal contact and experience) enhance and reinforce innovative behaviour and competitiveness. In the new member states, where FDI is — and will remain for a while — the principal vehicle of growth, the increase of disparities, as a result of the very selective location of FDI, will be marked. The reduced level of structural and cohesion support will certainly not be sufficient to countervail the impact of market forces.

In general, economic growth leads to pressures in and around urban areas for development. As this scenario is expected to produce additional economic growth, we can expect a corresponding intensification of human influence in Europe: draining of lakes, damming of rivers, building of infrastructure and construction of buildings. Urbanisation will however not occur evenly over the territory, but be concentrated in the Pentagon, and specifically in the largest settlements therein. Major urban agglomerations like Paris, London, Randstad and Ruhr will 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.

As noted, **urban development** in this scenario will be concentrated in the European core area, not necessarily within the administrative borders of the big cities, but rather in the Potential Urban Strategic Horizon (PUSH) areas 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. It is most probable that new high-tech jobs will be located not in the core cities but also in these surrounding areas where their most important resource and production factor, the professional and highly skilled labour force are most easily available. Consequently, the fate of the core of cities will depend much less on industry and much more on other factors, like their role as service centre, their tourism attraction, etc. In the new member states and other peripheral areas the future development trend of the urban system is less certain in this scenario. The reason for this is that they will be highly dependent on the outsourcing activity of transnational enterprises and less dependent on endogenous factors. If their main investment motive and location factor continue to be cheap labour, transnational enterprises have to look for more and more peripheral and smaller places where this type of labour force is still available. This will result in a highly decentralised, but unstructured pattern. If those enterprises increasingly utilise the higher educated and skilled labour force of these countries, this will result in the same type of urban structure as in the more developed countries, yet at a more modest level.

2.4.2.2.9 Summary and conclusions

While the growth in Europe as a whole will be more dynamic, it will be accompanied by growing regional (but not necessarily national) disparities. Larger metropolitan areas with sufficient facilities like universities will profit from the shifts in EU policy. At the same time, less populated regions will decline further. This is also likely to contribute to additional pressure on the existing transport infrastructure in the Pentagon, and will probably result in higher levels of environmental pollution.

2.4.2.3 Economy Scenario II: EuroTigers

This scenario describes a situation where the EU pursues a strong two-pronged strategy of economic competitiveness and territorial cohesion. This is currently articulated in the Lisbon/Göteborg strategy, which aims at competitiveness, cohesion and sustainable development, and thus echoes the principles stated in the ESDP. The concept of polycentricity is used as a vehicle to achieve implementation.

2.4.2.3.1 Scenario hypothesis

In this scenario, the EU embarks on a mission to implement the Lisbon/Göteborg strategy. The approach differs markedly from the previous scenario however. While large enterprises and advanced regions will adapt to the new requirements based on (own and external) private resources, knowledge-based and innovative development of small and medium-sized firms and of more peripheral regions will need to be supported by EU and national policies. It assumes also that a more differentiated approach will need to be applied to countries and regions that are in quite different situations. According to the EuroTigers strategy, support is given to areas with the potential to become competitive on a global scale. Consequently, new competitive knowledge and innovation centres will emerge both inside and outside of the 'Pentagon' and in metropolitan areas. The EU and cohesion policy will play a more active role in these developments than previously. The most lagging regions are largely 'written off' as having little promise for improving the EU's competitiveness. Like the other scenarios, it is assumed that current globalisation trends will continue as well as the rise of the knowledge economy. It furthermore assumes that external conditions will be favourable, or at least non unfavourable, and enabling to implement the reform of the European Union.

2.4.2.3.2 Driving forces

The main driving forces of this scenario are the ambitions of the Lisbon/Gothenburg strategy and the midterm review, European enlargement, globalisation and increasing pressure from international competitors in the knowledge economy. These will be considered in turn.

- **Critical reports:** Lisbon/Göteborg remain the best statement of European ambitions behind which most member states and citizens can rally. The midterm reviews only emphasise the fact that more efforts — not less — are needed at the European scale. This is consistent with the ESDP and many ESPON findings. In addition, insights into the knowledge economy show that 'softer' criteria are also vital in securing a region's competitiveness, an argument for retaining the aspects of cohesion and sustainability in the Lisbon agenda.
- **Enlargement:** there is a formidable task of reforming sectoral policy in a fair way to accommodate the new member states and bring them up to speed with the rest of Europe. It is acknowledged that the low starting point in terms of GDP per capita can translate itself into high annual growth, and thus interesting to investors.
- **Globalisation:** the mediocre economic performance of Europe in terms of annual growth could be augmented with the incorporation of developing regions (EuroTigers) gained by the enlargement into the EU.
- **Governance:** economic organisations (enterprises) will apply business strategies suitable to enhance competitiveness and innovation. Governments and politicians of member states, inspired by their responsibility for the future of Europe, will implement those changes in the institutions, laws and regulations at national and

supranational level which are necessary to set the European economy on a new development path, without losing the specific European achievements and social traditions.

2.4.2.3.3 *Developments and events (story line)*

In 2004-2005, the European Commission submitted its proposals for the regulation of Structural and Cohesion Funds in the programming period 2007-2013. These regulations already took notice of the previous debates on this subject. Net payer countries required more proportionality between the amount of EU support and the accompanying control and amount of regulations. Therefore, in case of support to 'Regional competitiveness and employment', member states could select the eligible areas, the principle of additionality had to be applied not on project, but only on programme level and there was more space to apply national regulations. In contrast, in case of 'Convergence' support, the Commission's regulations covered and regulated a substantially larger part of the decisions.

But during the further preparations it turned out that some of these regulations did not fit the needs of the new and less developed member states either. In the preceding one and half decade, only very few regions – mostly the capital regions – were the carriers of economic growth and producers of the increment of GDP in these countries. Some of them – as a result of their excellent growth performance – would have lost their eligibility for Structural Funds support. This, however, would have seriously, endangered the success of the catching up process, these regions having been so far the only carriers of growth. Looking at these facts, the Commission changed its mind. Continuing the practice of the 2004-2006 period, Structural Fund supports were allocated to the countries and not to regions. The whole area of the countries became eligible for support, but with qualifications. More developed regions could use it for eliminating some bottlenecks of infrastructure, for the rehabilitation of abandoned industrial areas (brown-fields), for supporting innovation and research, for human resource development and training and for creating high-tech workplaces.

The new regulations worked well. These regions – not only in the new member states, but also in other less developed areas – which performed best in the previous period, continued to do so in the next one as well. A gradually increasing share of Structural Funds were allocated according the principle of 'rewarding the previous performance' within the less developed regions. This method substantially accelerated the catching up process of national economies as a whole. At the same time, obviously, disparities within countries increased. But, as a result of the catching up process, the countries achieved earlier the position, to support their own less developed regions. Consequently, European Cohesion policy could be abandoned in the 2020s, but after having achieved a considerable success in helping less developed member states in catching up to the EU average.

European Cohesion policy could be abandoned, the more so because the enlargement process, though having been continued, still remained within reasonable limits. Romania and Bulgaria joined the Community in due time (2007), the countries of the Western Balkans in the 2010s. But Turkey joined the Community only in the 2020s. It was especially important in the case of Turkey to have recourse to the Structural Funds only in the case of the growth poles (this regional development policy had been applied by Turkey already in the 1920s, by moving the national capital into the then tiny town, Ankara, amidst the Anatolian peninsula).

In the new member states, rural development policy also pursued a course, different from that practised in the old member states. In 2004-2006, the share of Pillar 2 of the CAP (rural development) represented 50 percent of all allocations (interventions) while in the old member states this share was hardly more than 10 percent. In 2007-2013 the share of Pillar 1 in new members slightly increased, but the substantial difference remained. This

means that rural restructuring took place much more rapidly in the new member states, causing serious difficulties in a transitional period. Later, however, they disposed over a large rural labour force reserve which could be utilised as a factor of growth in other sectors.

Migration increased substantially in the 2010s and 2020s. But, while in the new member states domestic migration prevailed (from less developed and slowly growing regions toward dynamic ones), in the old member states external sources of migration dominated, accompanied by social and cultural tensions.

2.4.2.3.4 Contextual elements of the EuroTiger strategy

With the subsequent enlargements the European Union became more heterogeneous. Heterogeneity poses, without doubt, a threat to community governance, but simultaneously it is an opportunity as well. The European Union has to apply a more differentiated approach to countries and regions being in very different situations and at rather different development level. A differentiated approach is not necessarily contradictory to integration and can, in specific situations, even facilitate and promote integration. In addition, although the new member states are lagging economically, for precisely this reason they have a great growth potential, which far exceeds that of the elite areas in Europe in proportional terms. This is the essence of the EuroTigers philosophy.

Indeed, economies in the new member states — and those of the 'old' cohesion countries as well — are now growing faster than the EU average. Obviously, their economic weight is not sufficient to give a momentum to the overall growth of the EU, nevertheless, theirs can be a valuable contribution to the dynamics and to the more balanced spatial structure of the EU beyond their proper weight, if managed properly. That is one of the main elements of this scenario.

The midterm review of the Lisbon/Göteborg strategy provides a new impetus for change within Europe. The sobering conclusions serve as a call for action to implement the strategy in its full form: competitiveness, cohesion and sustainability. This becomes a rallying call for all member states; rather than accepting a two-speed Europe, all member states must band together to ensure that Lisbon becomes a reality. In order to raise the political support necessary in an enlarged Europe, the strategy devised to unite old and new member states stresses the complementarity of competitiveness and cohesion. Ireland is held up as a 'EuroTiger', a shining example of successful use of structural funds, and a model for the N10. Its progressive stance on intra-EU migration is also praised.

2.4.2.3.5 The 'EuroTiger' strategy

The essence of the Tiger strategy is to identify specific areas and sectors that hold the most promise for rapid and sustainable economic development. Unlike 'best foot forward' these are not necessarily the elite. Proponents of the EuroTiger strategy see devoting resources solely to the performing areas as flawed for three reasons. First, they already have such formidable resources that any extra support provided by the EU would be very small in proportional terms. Second, since these top-performers are already successful (by definition), they most likely have the resources to remain competitive without EU assistance. The EuroTiger strategy, in contrast, seeks out instances where it can make a decisive contribution. The philosophy is similar to that of regional policy where funds are only given as a critical extra push for a project, rather than comprising a significant share of the total costs.

Like in spatial development, the motto is that polycentricity constitutes the golden mean between equity/welfare and efficiency/redistribution. This has the clear advantage of broadening the base of political support for the strategy, seen as a prerequisite for the

implementation of the Lisbon strategy (COM(2005)24, p. 12). The experience of the last years seems to confirm the viability of this strategy. The table below displays the share of capital regions in the increment of GDP in the Central and Southeast European candidate countries in the period between 1995 and 2001. In Romania and Bulgaria this share is more than 100%, because in all other regions GDP had declined. In the Czech Republic and Hungary capital regions have produced about two thirds of the increment of GDP. Even in Poland and Slovakia, where development was more balanced, capital regions produced more than one third of the increment which is much higher than the respective regions' share in population.

| Country | Capital region | The share of capital regions in the increment of GDP |
|----------------|--------------------|--|
| Bulgaria | Yugozapaden | 151% |
| Czech Republic | Praha | 65% |
| Hungary | Közép-Magyarország | 58% |
| Poland | Mazowieckie | 35% |
| Romania | Bucuresti | 278% |
| Slovakia | Bratislavsky | 38% |

Source: CEC: *Third Report on Economic and Social Cohesion*. Statistical Annex. Brussels 2003

Table 15 The share of capital regions in the increment of GDP in the candidate countries 1995-2001

| Country | Region | Annual growth rate | Per capita GDP as percentage of EU15 average | |
|---------|-------------------------------|--------------------|--|-------|
| | | | 1995 | 2001 |
| PL | Mazowieckie | 10,4 | 42,7 | 63,7 |
| IRL | Southern and Eastern | 9,8 | 70,5 | 85,4 |
| IRL | Border, Midland and Western | 8,1 | 101,5 | 129,2 |
| PL | Wielkopolskie (Poznan) | 7,8 | 33,8 | 43,4 |
| RO | Bucuresti | 7,4 | 38,1 | 52,3 |
| PL | Pomorskie (Gdansk) | 6,5 | 34,4 | 41,6 |
| PL | Podlaskie | 6,3 | 26,0 | 37,0 |
| PL | Malopolskie (Kraków) | 6,2 | 30,4 | 35,3 |
| FIN | Uusimaa (Helsinki) | 5,9 | 128,8 | 140,3 |
| NL | Flevoland | 5,8 | 83,3 | 82,4 |
| PL | Lódzkie | 5,8 | 31,3 | 36,9 |
| PL | Zachodniopomorskie | 5,8 | 35,3 | 40,5 |
| LV | Latvia (Riga) | 5,7 | 24,7 | 33,4 |
| SK | Bratislavsky | 5,7 | 91,5 | 101,8 |
| PL | Świętokrzyskie | 5,5 | 27,3 | 31,2 |
| FIN | Åland | 5,4 | 119,2 | 141,6 |
| PT | Algarve | 5,4 | 66,0 | 72,4 |
| EE | Eesti (Tallin) | 5,2 | 33,6 | 38,5 |
| HU | Közép-Magyarország (Budapest) | 5,2 | 65,7 | 81,3 |
| UK | Inner London | 5,2 | 229,8 | 263,4 |
| UK | Berkshire, Buck, Oxfordshire | 5,2 | 119,9 | 149,0 |

Source: CEC: *Third Report on Economic and Social Cohesion*. Statistical Annex. Brussels 2003

Table 16 The most dynamic NUTS2 regions of the European Union and the change of their relative development level 1995-2001

This phenomenon is not typical of the new member states. Practically all capital regions have increased their relative level of development (compared to EU average) in the Northern, Southern and Eastern periphery: Stockholm, Helsinki, Budapest, Bucharest and Warsaw with more than 10 percentage points. Beside capital regions, there are a few other regions outside the Pentagon which can fulfill the growth pole function.

This means that without these regions the 'catching-up' process in these countries could not take place, these regions and cities are actually the 'carriers of growth' in the relevant areas. It is a fact that cannot be disregarded. It is assumed in this scenario that EU policy will build upon this process as a very important factor of European cohesion policy and, simultaneously, a factor of European growth and competitiveness. Additionally, this development process will largely contribute to a more polycentric structure of European space and urban network.

2.4.2.3.6 Implementation of the strategy

This section will provide a short summary of the various interventions into strategic decisions and sectoral policies that are required to realise the strategy outlined above.

- **Agriculture:** CAP in its present form is not viewed as supporting the EuroTiger strategy because it tends to work against cohesion and supports an old economic sector. There is little economic reason for maintaining the current level of European exports of agricultural products, made inexpensive by lavish Pillar 1 subsidies. However, Pillar 2 does seem to hold some promise for maintaining the environmental quality of rural areas.
- **Competition:** internal market rules (including public procurement) must be rigorously applied as the development of new markets necessitates unobstructed flow of capital and labour. Markets must not be distorted with national state aid (usually to failing industry), but instead aid must be given at a EU level with the goal of acting as a catalyst to allow exciting new businesses to gain their footing.
- **Enlargement:** this is a dynamic process in this scenario. Nevertheless, this process is not exclusively guided by market expansion and political control considerations, as in the first scenario. The deepening of integration is an important aspect of the process as widening of the EU. Therefore, the enlargement process is subject to reasonable limits, set by political, social and economic absorption capacity. The present candidate countries (Bulgaria, Romania, Croatia and perhaps Turkey) will join the community but further enlargement is not to be expected within the time horizon of the scenario. The policy approach toward individual member states or groups of member states will be differentiated to reflect the different potentials of member states.
- **Environment and nature:** value for a clean environment and natural heritage is seen as an asset of Europe, rather than a liability, which sets it apart from its major competitors. Natura2000 should be implemented throughout Europe and environmental standards applied firmly because all of Europe's citizens have a right to clean air and water. Economic development does not have to come at the cost of the natural environment.
- **R&D:** investment in R&D is likely to boost GDP in Europe as it has been noted that 'government-financed R&D expenditures complement domestic industry-financed expenditures on R&D ... both direct funding of business R&D and tax incentives for R&D have a significant and positive impact on business R&D spending in OECD and

EU countries' (EC, 2004 *European Competitiveness Report*, p. 11). However, the report also emphasizes that the causality is more difficult to establish, given the presence of other relevant variables. Nevertheless, the policy recommendation is clear: 'increasing the generosity of R&D subsidies may become instrumental in increasing business R&D to levels closer to those of other main world leaders in this area,' currently around 3%. So, in order to meet the Lisbon objective of 3% of GDP, the budget for research will need to be increased dramatically. With regard to the Framework Programme, an evaluation of FP6 showed that it was 'almost impossible' for SMEs to participate in the 'Networks of Excellence' programme and that it was particularly difficult for newcomers to become partners (High Level Group chaired by Ramon Marimon, *Evaluation of FP6*, 21 June 2004). In EuroTigers, this problem is remedied with specific measures to ensure that new and smaller organisation also reap the benefits of EU R&D policy. Avoiding uneasy compromises, the principle of scientific excellence is consequently used as the core criterion for decision-making within the framework of European R&D funding. However, instead of taking for granted a ruthless competition for scarce financial means, European policies (in coordination with national policies) follow a strategy to encourage researchers and small businesses in less favoured regions to participate in innovation processes funded either by public means or by private resources. As recommended by ESPON project 2.1.2 (ECOTEC Research and Consulting without year of publication: p. 23), the European policy supports a better coordination between the Framework Programmes (FP) and the Structural Funds (SF), which enhances the innovation capability of disadvantaged regions. The pursued strong regional policy component does in no way mean a funding procedure following the 'watering can principle'. Instead, it follows the idea of strengthening those disadvantaged areas which possess the relatively best chances for catching up and becoming competitive regions with a high innovation capability. As far as the accessibility of broadband infrastructure is concerned, which shapes an essential element of the Lisbon objectives regarding Europe's way towards the leading knowledge society, some progress will be reached regarding the roll-out of broadband infrastructure in less densely populated regions. This supply-side improvement of broadband access in these disadvantaged regions is accompanied by boosting the demand for internet services delivered by broadband, e. g. by the establishment of e-learning opportunities for citizens and employees in less densely populated areas and by offering e-government solutions. Policy actions to strengthen development cores in disadvantaged areas are accompanied by initiatives to improve the mobility and the skills of the workforce, e. g. by improving the accessibility of the emerging development cores and by offering training measures. Spatially concentrated efforts to improve the quality of living in these cores will lead to a growing attractiveness of these locations for young, well educated people (whereby, however, the attractiveness of the agglomerated spaces in the core of Europe remains greater. Large companies possess and use the capability to manage these training requirements themselves whereas small firms benefit from public support, e. g. from initiatives to create 'learning regions', based on private-public partnerships.

- **Regional policy:** the tenets of the policy proposed in the *Third Cohesion Report* (2004) are largely consistent with the EuroTiger strategy, insofar as both competitiveness and cohesion are objectives. However, EuroTiger goes further in linking the two, taking full heed of the recommendation of ESPON 2.1.2 (2004) to facilitate coordinated implementation of regional and R&D policy. The same report has shown that R&D investments in less developed regions may deliver more value-for-money as the impact on accelerating the 'catching up process' is greater. **Transport:** as the EuroTiger strategy rests on the idea of polycentricity, this will become the Leitmotiv of the EU's transport policy as well. For the most part, this corresponds with initiatives already underway: the linkage of major 'peripheral'

centres with the core of Europe with high-speed connections. However, a budgetary increase is necessary to translate EU-scale priorities into concrete results.

2.4.2.3.7 Impacts

Since the ambition is to enter the economy scenarios in the MASST model, only certain qualitative and rather guarded statements can be made here regarding *expected* results. These will have to be borne out later by the quantitative results.

a) Aggregate economic impacts

In a report to the European Commission *Delivering Lisbon*, the authors state that 'studies and simulations, conducted by the Commission, have concluded that the simultaneous and integrated pursuit of reforms [akin to the EuroTigers strategy] will produce an increase in the GDP growth potential of the Union in the order of 0.5-0.75 percentage points over the next 5 to 10 years' (COM (2004) 29 final/2, p.2).

b) Other impacts

In terms of **rural development**, EAGGF allocations to countries and regions will not dramatically decrease (their sum will remain unchanged) but within that sum the share of Guidance section will increase substantially, first in the new member states then in all countries in the EU. That means that radical structural changes will take place in the rural areas. Their accessibility will improve substantially. Structural Funds will support the generation of non-agricultural jobs and income opportunities in these areas. In the new member states, small villages will establish microregional cooperation for employment generation. Before 1989, a large part of income and employment in rural areas was generated through non-agricultural activities of agricultural cooperatives (mostly supplying services for large enterprises). After the political and economic change this source of employment and income disappeared. The acquired skills and infrastructure are still there and can be re-utilised, certainly in other organisational and ownership forms than in the past. These measures are indispensable in countries where the share of agricultural employment is still very high.

The **transportation network** will show a smaller rise in volume in the Pentagon than the previous scenario, but higher pressure outside. Connections between EuroTiger centres and the Pentagon will experience the greatest relative increase in traffic.

Migration will be a rather large-scale and dynamic process in this scenario, but not so unidirectional as in the first scenario at the macro level. For many of the new migrants, the destination of the migration will be the new growth centres outside the Pentagon area (described in the 'Urban development' paragraph below). This migration will be even more intensive than that to the traditional destinations, because, in these areas, more people will be affected by rural structural change. As a result, the Pentagon area will be partly relieved from a part of the migration pressure.

2.4.2.3.8 Territorial image in 2030

Territorial cohesion in Europe will decrease at the national level as more competitive regions seize new opportunities, and are actually stimulated in doing this by the EuroTiger adapted structural funds. Territorial cohesion will however increase at the macro (European) level as

secondary regions acting as carriers of growth — like Prague, Budapest and Warsaw — catch up to and in some respects even overtake regions in the Pentagon.

At the meso level, disparities within these countries will increase (as it has been experienced in the last one and half decade), since the large part of national GDP increment will be born by these leading regions. These increasing disparities can be regarded as of transitional, provisional character. Filtering down and 'spread' and 'pull' effects sooner or later will have an impact upon the growth of the other regions of the respective countries, though this internal catching up process might prove to be of rather long run character. Nevertheless, within countries there is always a budgetary redistribution process, so that poorer regions are beneficiaries of higher income generation in the growth poles even in the short run.

As EuroTigers predicts a higher level of economic growth as a result of the targeted policy, we can expect changes in land-use in the most affected areas. Unlike 'best foot forward' this does not concern the largest metropolitan areas in the Pentagon, but smaller cities therein and larger centres in the periphery.

Consequently, the **urban development** patterns discernable in this scenario are increasing pressure around the EuroTiger urban concentrations for space, reflected in rising land prices and rents. Suburbanisation around these centres and gentrification of the most attractive parts of the cities are to be expected. The influx of external investments will allow local decision-makers to make improvements in the condition of the quality of life of the inhabitants, but most probably this will be targeted towards amenities to attract knowledge-workers.

2.4.2.3.9 Summary and conclusions

This scenario envisions the implementation of the Lisbon strategy as it was formulated in 2004, with reference to cohesion and sustainability. There is an obvious link to be made between these economic ambitions and the three-pronged strategy of the ESDP. For this reason, the concept of polycentricity is also well adapted to the EuroTigers strategy. The outcome of the scenario is [although the MAAST model has to confirm this] a slightly higher total GDP growth than the 'best foot forward' scenario and considerably higher growth than the next two scenarios. This is due to improved effectiveness of stimuli. The effect on territorial cohesion will also differ from the previous scenario. Here, it is expected to increase at the macro level (rather than decrease) but decrease at the meso level.

2.4.2.4 Economy Scenario III: The Beaten Track (was Blühende Landschaften)

This scenario describes a situation where the EU pursues a strong policy in favour of cohesion. Lagging regions and sectors are bolstered in order to allow them to achieve a status fitting for a civilised Europe. Matters of sustainability and cultural heritage are a major contributing factor to this strategy: especially clean industry and knowledge-oriented businesses are stimulated in lagging regions, making it unnecessary to relocate to find work.

2.4.2.4.1 Scenario hypothesis

Here support is given to the most lagging regions to bring them to a certain EU minimum standard. EU and national structural support will continue to flow to less developed member states and regions. This includes support for infrastructure and environmental investments, but also for human resource developments in these lagging regions. The goal is to make all European regions self-sustaining and have a reasonable quality of life; nobody should be forced to abandon his or her homeland to find a job and no European citizen should live in abject poverty.

2.4.2.4.2 **Driving forces**

The main driving force behind this scenario is the growing dissatisfaction in Europe of the unsustainable development path it has been following, and coping with the wide rift in economic position between old and new member states. Another is the desire by a number of vested interests to see cohesion support continue flowing to their regions. Finally, although not necessarily a 'driving force' *per se*, there is the general institutional friction to reform.

- **Critical reports:** the costs of sprawl and mobility are made apparent by a number of reports critical of the current neoliberal discourse, raising public sympathy. Europe must compete in the world in terms of *joie de vivre* and not purely using sterile GDP indicators. The 2004 Eurobarometer demonstrated that the European public are of a similar opinion: they do not necessarily equate 'quality of life and economic performance' either (EC, 2005).
- **Enlargement:** having such disparities within Europe is seen as unacceptable, as reflected in a statement by Commissioner of regional policy Hübner that, 'it is hardly surprising, in view of enlargement, that the Commission has set real economic convergence as the main objective for the future. In financial terms, this would absorb some 78% of total resources over the period of the next financial perspective' (EC, Speech/05/70: 3 Feb. 2005).
- **Governance:** European institutions will continue to be dominated by intergovernmental decision-making in which business interests are only one factor of influence. Trade unions, farmer's unions, national, regional and local administrations, and – what is most important – voters' opinion are also factors to be considered.

2.4.2.4.3 **Developments and events (story line)**

Looking back from the present – 2030 – Europe has changed a lot, but its basic situation and its institutions are not very dissimilar to those existing 25 years ago. Perhaps because governments and vested interest organisations – though always unsatisfied with the present situation – did not want to endanger their already acquired position and therefore refused radical reforms with incalculable consequences.

In 2005, the financial perspective for the period 2007-2013 was approved with minor amendments. Amendments affected mostly the newly established 'Competitiveness for growth and employment' appropriation. Since nobody knew for certain who would be the beneficiary of this new fund, there was no serious resistance against the proposals to curtail this fund and transfer the resources to the more traditional appropriations of agricultural and cohesion policy. Transfers obviously could be justified by enlargement, whereas several countries with large agricultural population and with lagging behind regions had joined the Community.

The increase of the agricultural and cohesion budget had been approved. It was partly the consequence of the large number and significant voting weight of – old and new – beneficiary countries in the Council of Ministers. Nevertheless, some countries, first of all those, neighbouring the new member states (Italy, Austria, Greece and Germany), insisted that the increased allocations should be exclusively used for environmental improvements, transport infrastructure, risk prevention, water management and for the conservation of natural and cultural heritage. They should not be used to support economic activities and business enterprises, not even small and medium ones. They were afraid of a situation in which cheap labour costs and EU and national support to SMEs in the new member countries would result in a 'rent shifting' situation which would seriously jeopardize the competitiveness of their own enterprises. They argued furthermore, that new member

states can afford low corporate taxes only because they can compensate the budgetary losses by generous Structural and Cohesion Funds allocations. They required therefore that beneficiaries of Structural Funds should raise their corporate tax rates to the EU average level.

These requirements had been accepted by the Council of Ministers. Less developed regions generally, but first of all new member states, enjoyed generous Structural and Cohesion funds support. Their environmental situation had improved substantially. The Commission preferred railway network improvements, and they have been implemented in several countries. New national parks have been established, the surface of protected areas increased substantially, and new cultural facilities built. Tens of thousands of government and local government officers have participated in training courses aimed at increasing their skills in the management of the Structural Funds.

But the utilisation of the Funds was still relatively low, and the results in respect to income generation and job creation remained also below expectations. One of the reasons for the first deficiency was perhaps the too narrow definition of the possible areas of Structural and Cohesion Funds' utilisation. Income generation and job creation was insufficient partly because SMEs did not enjoy Structural Funds support, partly because the raising of taxes discouraged investors from new investments. Unemployment increased substantially in the new member states. In view of these developments and in fear of being swarmed by Eastern migrants, old member states prolonged the derogation of free movement of labour for another five years, from 2010 to 2015.

Discouragement happened also in another aspect. The heavy burden of enlargement, in terms of Structural and Cohesion Funds supports, discouraged net payer countries from further enlargement. Bulgaria and Romania joined the European Union in 2009 instead of 2007, but further enlargement was postponed to the indefinite future. Switzerland and Norway, unwilling to pay the high price of membership, refrained from accession.

Consequently, now, in 2030, the EU is facing more or less the same problems as in 2005. The problems and tensions could not be solved, because the different and confronting interests blocked change and essential reform.

2.4.2.4.4 Contextual elements of the strategy

From the plethora of interests vying for EU support, emerging policy directions and decisions governing the member states and the Union, as a whole, are quite divergent. The endeavour to meet very different and sometimes contradictory requirements and expectations would result necessarily in partly contradictory and inconsistent decisions, measures and policies. These contradictions will weaken the effectiveness of these decisions and policies significantly.

With the subsequent waves of enlargement, the number and share of small and less developed countries have increased significantly in the European Union and so did their influence on European decision-making. Being net beneficiaries of Community budgetary allocations, their interest is to maintain the payments to the common budget on a possibly high level and to maintain a high share of cohesion and structural funds and — perhaps to a somewhat lesser extent — that of agricultural supports. It is probable therefore, that contributions to the common budget cannot be reduced to the extent that net contributors would like to see, nor can the share of structural, cohesion and agricultural supports. What can be perhaps achieved, it is the concentration of cohesion and structural supports to the least developed — mostly new — member states and their regions. In this respect, there is a kind of agreement between the largest net contributors and the poorest members. Cohesion and structural support will be spent in the least developed and peripheral areas, where it is really needed, but its effectiveness and the capacity to absorb it efficiently are ambiguous.

On the other hand, old member states will succeed in achieving that the whole of cohesion support and the overwhelming majority of structural supports will be spent on infrastructure, environmental improvements, human resource development and not on direct support to (medium and small) enterprises. By referring to the regulations of competition policy, the arguments in favour of these proportions can be strongly supported. Nevertheless, the fear of cheap labour's concurrence, reinforced by EU support, plays an important role in this endeavour of the old member countries.

Unfortunately, small and medium sized enterprises did not exist in the new member countries before the political and economic change. All such businesses were established in the last fifteen years. They did not have the time to accumulate resources and therefore they desperately need capital support.

Experience has proved that the development of infrastructure and human resources, the improvement of the environment are necessary but not sufficient conditions for development and growth in these countries and regions. Technical and financial support to small and medium enterprises is also required. There are several examples even in the old member states for the case that huge infrastructure and environmental investments did not yield the expected results in terms of income and employment generation (East Germany, Southern Italy, Spain, Greece). However, the example of Eastern Germany demonstrates that the reasons explaining the success of regional policies lay beyond the problem of supporting infrastructure versus businesses.

The impact of taxation harmonisation will be similar. Harmonisation in that case does not mean the lowering of tax levels in the 'overtaxing' countries, but the raising of tax levels in countries where the tax level has been low. Large and highly developed member countries want to avoid in this way the 'flight' of capital to these 'countries of low taxes'. Their argument is that these countries can afford to impose low taxes only because they are compensated by Structural Funds support for the loss of tax income. Nevertheless, for some countries it would be worthwhile even to lose some Structural Funds, if they could attract additional FDI into their countries to generate income and employment.

2.4.2.4.5 *The Beaten Track strategy*

European countries maintain social cohesion through public institutions. Society accepts that a more equitable distribution of welfare limits the possibilities of improving economic efficiency. Society also accepts that sustainable development, care for and preservation of the natural and cultural environment mean some restrictions for several economic activities in the short run. But society regards these restrictions as part of the 'European values' in contrast to the practice of some countries overseas and in the Far East. The basic hypothesis of this scenario is that the principal policy directions – at EU and national level – will not change fundamentally in the next decades. Obviously, this hypothesis does not exclude minor changes in the formulation of policy objectives and their implementation. Development will take place in the present framework. This framework is flexible and good enough for enabling the development of the European economy without major crises and shocks, but not adequate for switching it over to a substantially higher rate of growth.

2.4.2.4.6 *Implementation of the strategy*

This section will provide a short summary of the various interventions into the sectoral policies that are required to realise the strategy outlined above.

- **Agriculture:** as the least privileged regions in Europe are rural in character, and even more so with the 2004 enlargement, CAP will continue to command a large portion of the total EU budget. However, unlike the current regime, CAP will be changed to benefit the poorest areas (organic farming?) with little emphasis on

production, and much more on the conservation of natural and historical heritage of rural areas.

- **Competition:** state aid policies will be relaxed in so far as national funds are injected to sustain ailing industries in poorer regions.
- **Environment and nature:** much more emphasis will be put on a clean environment. The open space in peripheral regions is harnessed to generate renewable energy, and subsidies are available for this purpose via regional policy.
- **Enlargement:** in this scenario, the main objective of the European Union is deepening integration. More functions and tasks are delegated to the supranational institutions, but without the fundamental reform of these institutions and of decision-making (as it happened so far). Consequently, this deepening will be in contrast with the increasing heterogeneity of the community. This will result in slowing down the enlargement of the European Union. The present candidate countries (Bulgaria, Romania) will be – though perhaps with some delay – admitted to the EU, but further enlargement will be postponed for an indefinite period.
- **R&D:** under the burden of increased cohesion spending, the framework programmes will lose support, except insofar as R&D policy can be administered as a kind of aid in poorer regions (e.g. subsidising exchanges of personnel and information to lagging regions). The objective regarding Europe's development towards the globally leading knowledge economy was not realized until now. The major reform steps set up by the Lisbon agenda remain more or less undone. In terms of innovation performance, the gap between EU and US, recorded in the early 2000s (see Council of the European Union 2004: p. 10), will continue in the following decades. Therefore, Europe's desirable catch up in productivity does not take place. Europe continues to show a relative backwardness regarding the productivity impacts of ICT (see the Scenario Base, paragraph on 'The role of information and knowledge for global competition in Europe'). An essential part of the persisting global innovation and productivity disparities can be addressed to the obsolete innovation system in Europe which has long been under criticism (see *ibid.*). It has not undergone substantial reforms until now. Inefficiencies continue to exist, particularly regarding the linkage between industry and science, the under-developed competition between universities and a lack of peer-review procedures for funding universities, whereas in the US these aspects shape essential strongpoints of its innovation system (see Commission of the European Communities 2004, p. 179 with reference to Gordon 2004). The 'homework' in other R&D related policy fields are far from being done, too. Deficits continue to exist, for example, regarding sufficient solutions for securing intellectual property rights and with respect to non-bureaucratic immigration procedures for top research personnel from outside Europe. The brain-drain of young graduates towards the US, as it was already recorded in the early 2000s, is ongoing, and reversely, the attraction of outward top researchers towards Europe is rather poor. For these reasons, the trend followed by large European companies to conduct their R&D outside Europe could not be stopped and will be going on. As a part of the equity-oriented policies pursued by the European and national authorities, support programmes to improve the skills of the (long term) unemployed will be implemented. However, the disadvantaged regions show an overall weak economic performance, and due to the absence of strong development cores within these areas, the job opportunities remain rare. The skills obtained in the training courses, to a large extent cannot be used in practise and will tend to be devalued. Younger, well educated residents will tend to out-migrate towards the agglomerated spaces outward their region, seeking employment opportunities. Elderly people often become dependent on social benefits, which in turn limits public spending for investment purposes.

- **Regional policy:** undergoes a 'back to the basics' reform where the majority of structural funds will be targeted towards cohesion support. Other objectives (e.g. cooperation) are secondary, and must serve the primary regional policy goal of cohesion.
- **Transportation:** more emphasis is put on sustainable modes of transport, especially to connect peripheral regions. Additional congestion in the Pentagon is not viewed as a Community priority, but something to be tackled at the member state level.

2.4.2.4.7 **Impacts**

Since the ambition is to enter the economy scenarios in the MASST model, only certain qualitative and rather guarded statements can be made here regarding *expected* results. These will have to be borne out later by the quantitative results.

a) **Aggregate economic impacts**

This framework is flexible and good enough for enabling the development of the European economy without major crises and shocks, but not adequate for switching it over to a substantially higher rate of growth.

b) **Other impacts**

In this scenario, the Pentagon loses its competitive edge in the world economy as funds are redirected to other regions in Europe, and a net loss of efficiency is produced as subsidies are disbursed according to need rather than promise. On the other hand, the environmental quality, the protection and maintenance of cultural qualities and the standard of living improve in previously lagging areas.

This overall positive assessment of decreasing disparities requires some qualifying additions:

1. This cohesion mainly concerns infrastructure provision, accessibility of services, the quality of the environment, welfare services and facilities and level of education and training. It refers less to the level of income and even less to the level of employment. In the last respect, disparities might even increase between countries and regions.
2. The overall rate of economic growth remains relatively low in this scenario. Not so low as in the Balnibarbi scenario, but certainly lower than expectations.

With regard to **rural development**, support for agriculture will be the largest in this scenario, because contrasting interests will not enable to reform the CAP radically. Consequently, 'stabilisation and peace' in rural areas will be purchased at the expense of other regions, cities and social groups of the population. But even this stabilisation will be only partial. Together with the CAP, its important feature will also be preserved, namely, that big farms and developed areas are its main beneficiaries. The development of rural areas will be, therefore, differentiated. Rural areas under favourable natural and economic circumstances will fare rather well, while rural areas and farms in unfavourable circumstances will remain among the lagging and problematic areas of the EU, ridden by unemployment and poverty.

This scenario will also have different patterns of **migration**. One of the main objectives of this scenario is to create employment and income for people in their native country and

region. The large transfer of resources — through EU cohesion, structural and agricultural policies — should serve this objective. But if the structure and regulation of these funds will be inadequate for creating more jobs and income, then the huge transfer of resources will not bring the expected results. Consequently, despite the massive resource transfer, disparities in employment level will not decrease substantially and the intention to migrate will be strong in many parts of the European Union. This migration movement will strongly contrast with the objectives of cohesion policy and will give rise again to some incomprehension and dissatisfaction both in the countries, regions of origin and in the countries of destination.

2.4.2.4.8 Territorial image 2030

On balance disparities among countries and within countries are expected to decrease. The decrease of disparities among countries is due to two factors: first, that in absence of massive R&D and innovation incentives and pressures even the leading European regions will not be in the position to carry out the breakthrough in productivity and high tech technology, second, that EU and national cohesion and structural policies, focusing on most peripheral and underdeveloped regions, contribute largely to this convergence process.

To assess the probable impacts on **urban development**, we need to look to the mechanisms of the structural funds. One of the basic objectives of cohesion policy in the next programming period (2007-2013) is to improve the accessibility of services of general economic interest for every European citizen. This is the basic idea of urban development in this scenario. Cohesion and structural funds will be used to improve the provision with basic community services in all towns and cities, independently from their size and profile.

Consequently, the development of urban areas will be the most balanced in this scenario. Small towns will have the same chance to receive support for improving their infrastructure, as large ones. EU level urban policies will have the most influence on actual developments in this scenario.

The reconstruction and revitalisation of the central part of cities and towns will enjoy priority. EU cohesion and structural policies will not support extensive urban sprawl. The accessibility of basic services in every area will certainly slow down the excessive population concentration in large cities. Using ESPON terminology, the favoured urban formations in this scenario are FUAs and PUSH areas, and less MEGAs and PIA areas.

However, the major driving force of the urban system is, undoubtedly, the economy, business and economic growth. It is the economy which creates the basic hierarchies and networks in the urban system. In absence of dynamic growth, no high level infrastructure and service provision can serve as substitute for the lack of growth poles, 'spread' and 'pull' effects.

2.4.2.4.9 Summary and conclusions

Of all the scenarios, this seems the least likely to occur, given the current disposition of member states and globalisation tendencies. It has also been stated that 'it would be a political mistake to create a new division in Europe between a West that gives and an East that receives' (Speech/05/70: 3 Feb. 2005).

2.4.2.5 Economy Scenario IV: Balnibarbi for the Balnibarbians

This scenario describes a situation where support for European cooperation wanes, and nation states reassert their authority. Both competitiveness and cohesion policies are reduced, as well as other sectoral policies implemented at the EU level. Competition between member states increases, and territorial disparities increase as well.

2.4.2.5.1 Scenario hypothesis

The name is borrowed from Jonathan Swift, otherwise the scenario has nothing to do with the country of the same name in Gulliver's Travels. The scenario occupies the lower left segment of the system of axes, characterised by low equity and low efficiency. The basic hypothesis of this scenario is that populist politicians and one part of the national elites would pursue alleged national interests in a way which would significantly weaken the cohesion and integration of the European Union. This political movement might be the result of some domestic economic and political difficulties, for which politicians scapegoat the EU, the enlargement, the widening or the deepening of the EU. One reason for this change in policies can be the short-term disappointment and frustration with the results and impacts of enlargement either in the old or in the new member states or in both. National governments do not comply with their commitments to European policy objectives and regulations. Obstacles to free movement of labour would be maintained, the period of derogations would be extended. The regulations of EU competition policy will be more frequently evaded. This is the reason why the advantages of integration can be less and less exploited and, simultaneously, the effectiveness of cohesion policy will be also reduced.

2.4.2.5.2 Driving forces

The main driving forces in this scenario are a growing dissatisfaction with Europe and a populist anti-EU movement in many key countries. The common currency, the Euro, and the enlargement were blamed in particular as contributing to sluggish growth and high prices. Some of this sentiment originated with a key decision to limit EU cohesion support (and other support as well) to the most needy. Over time, in the more affluent countries there was less enthusiasm for redistributive policies to relatively distant regions. In these nations, the presence of the EU was felt primarily in negative terms (i.e. regulations and standards), further increasing anti-EU sentiment.

- **Critical reports:** like in other scenarios, new information about the failure to successfully implement the Lisbon strategy provokes a political response. Unlike the other scenarios, this is not interpreted as signalling a need for a new direction in policy, or intensifying policy in order to meet the Lisbon objectives, but results instead in a fatalistic view that Europe is incapable of delivering results. Throwing money at problems at the EU scale is counterproductive: firms are better served by more local level approaches, and particularly by lower taxes. Curtailing EU policies in favour of overall tax reductions is therefore advocated.
- **Governance:** trade unions, lobbying by farmers and pressure by other professional organisations rally against specific imports, migrant labourer, and outlets and shops of transnational enterprises. National political elites — in order to increase their votes — make concessions to these claimants. Intertwining between economic and political elites can also occur, especially in the less developed member states. All this would limit the dynamics of the Single Market, slow down or even reverse the deepening of integration and consequently limit overall employment, growth and cohesion.
- **Private enterprise:** a major driving force in this scenario is, like in the previous ones, vested interest, private capital and profit interest, not that of transnational

enterprises but those owned by the national elites. National elites claim — openly or not — preferential treatment in public procurement procedures and in subsidy allocations.

2.4.2.5.3 *Developments and events*

The processes characterising the present situation started in 2004, when the enlargement with ten new member states increased the heterogeneity of the European Union substantially. This rendered cooperation between all EU member states more difficult. Governments were willing to cooperate only if the countries concerned were sufficiently homogeneous. Soon, a club of rich and powerful countries was born within the European Union. This club intensified cooperation in various policy fields, including taxation and social policy, through 'reinforced cooperation'. This was a legitimate method of the Community, originally intended to create a 'two-speed' Europe, in which countries that lag behind would catch up with the frontrunners after some time. But new member states remained outside the core group because they were either unwilling or unable to join. Consequently, as early as 2010, 'two-speed' Europe ended up clearly in a 'two-tier' Europe where the division got a more permanent character.

In this situation, EU governance was not reformed into decisive and legitimate institutions. But ever more countries regarded the failure of reform in the EU as a cause that not really mattered. The bureaucracy in Brussels was seen as unnecessarily interfering, undemocratic and intransparent. Countries began to play down the power and importance of supranational decision-making. Integration came to a halt – it reversed de facto in some areas.

EU policies were only very modestly reformed during the 2010s: the share of the EU budget shrunk to 1 percent of overall EU GNI in 2014 and even lower in 2020. But even this reduced budget retained its distortional components e.g. in respect to CAP. The decreasing CAP support was partly replaced by equally – or even more – distortional national support measures. Cohesion policy remained ineffective. In fact, poor member states from the Central and Eastern European countries were unable to absorb the funds because they could not comply with the complex and demanding administrative procedures set by the European Union. Moreover, a large part of the cohesion budget continued to be transferred to richer member states (referring to the 'statistical effect'), because they were unwilling to give up their share.

Further enlargement of the European Union received little interest from member states, old and new alike, because they feared the import of ever more instability: Turkey did not accede to the European Union and the Central and Eastern European member countries remained outside the EMU. Those remaining outside the Union were disappointed and reacted with even more social and environmental dumping. Because of poor border controls in the East and because of the unwillingness of the Eastern neighbours to cooperate, EU member states suffered from an increasing inflow of illegal immigrants.

Meanwhile, legal migration within the European Union remained restricted. Governments, reacting to populist claims, and disregarding the basic principles of the EU concerning the four freedoms, imposed different restrictions and obstacles to hinder migration.

Many mature European industries became protected from outside competition through trade barriers. Additionally, national elites, disregarding EU competition policies, began to apply semi-legal or illegal support instruments in respect to public procurements, exceptions and preferred treatments. This was true in particular for agriculture, but also for network industries. Trade unions and other vested interest groups in the core countries exercised serious pressure on national and European level as well, in order to minimise wage dispersion. They formed a powerful lobby group in core Europe to hold up reforms in welfare

state managements. In the new member countries, first of all, entrepreneurial organisations and Farmer's Unions exercised pressure on governments.

By now, 2030, the European Union is primarily regarded as an economic organisation with focus on the internal market, disposing over one part of agricultural subsidies and structural investment support. Competition of national policies prevails in most sectors. Increasing mobility of capital intensifies policy competition.

2.4.2.5.4 Contextual elements

The political backlash against Europe was already evident in 2004 during the Dutch presidency. Although the historic enlargement of the European Union to include former communist countries dealt the decisive final blow to the cold war, this fact was greatly overshadowed by fear of job loss and exacerbations of 'net payer' status among many Western European nations. Guarded beginnings of a dialogue with Turkey regarding possible membership were equally greeted with consternation and disbelief amongst an increasingly Euro-sceptic public. Finally, arguably the greatest definitive moment in the history of Europe, the signing of the Constitution, passed virtually unnoticed in the media, and unread by the citizenry. Europe seems to have lost touch with the public.

- EU loses legitimacy and subsidiarity is reasserted by member states.
- Enlargement leads to reaction for renationalisation, including restrictions on movement of labour and capital.

One common feature of this scenario is that the capacity and willingness of nations to contribute to the Community budget would be reduced. The centralised resources of the Union will be from the second half of the 2010s not more than 1% of the overall GDP of the Community, perhaps even less. Opposing interests do not enable a structural reform of EU expenditures and the reform of the decision-making system in the EU will also be delayed. Because of the criticism and refusal of certain vested interest groups and political forces, a diminishing importance and role will be assigned to EU cohesion policy and to public policies in general: little government intervention in terms of direct subsidies, but more in terms of protecting the functioning of the market. A popular cry for 'small government' emerges: 'a group of six member states calling for major cuts in the Commission's proposal. With spending on agriculture already ring-fenced, any savings would have to be found elsewhere' (EC, Speech/05/70: 3 Feb. 2005).

In terms of policy priorities, there is no real change from the current situation. Consequently, the EU should have to perform the same functions and tasks as previously, but only with more limited instruments, possibilities and competencies. The EU will not be in the position to exert — with its instruments and resources — a really significant impact on the developments in the member states, while — before the public — it will continue to share the responsibility for the developments in the individual member states.

2.4.2.5.5 The Balnibarbi strategy

The economic policy is characterized by a double problem. First, the main reforms of economic policy in Europe which were regarded at the beginning of the 2000s as to be necessary to become a globally competitive knowledge society, remain unsolved. Thus, the hindrances for a stronger productivity growth identified in the early 2000s (see the scenario base), continue to exist. Second, contrary to the situation until 2013, the EU cohesion policy will tend to be weakened, particularly for the reason of a re-nationalisation of regional policies. The remaining scarce EU budget is primarily spent for the improvement of the basic infrastructures in less developed regions. Re-nationalization is the only 'reform' activity of this scenario. The absence of a strong regional policy component at a first glance might be

regarded as a discharge of scarce public budgets, in fact it might result in increasing economic difficulties. As a consequence of the – assumed – loss of responsibility and funding opportunities at the EU level for regional policy purposes, two different policy strategies at the national level are imaginable: a) national policy does not pursue an explicit regional policy; b) national policy to a certain extent conducts an own regional policy. In the Balnibarbi strategy the latter is assumed.

2.4.2.5.6 Implementation of the strategy

This section will provide a short summary of the various interventions into strategic decisions and sectoral policies that are required to realise the strategy outlined above.

- **Agriculture:** CAP is maintained under pressure of farming interests, additional support given at the member state level.
- **Competition:** this would focus on a combination of abolishing state aid, liberalization of public companies and anti-monopoly regulations functioning within the context of a low-tax environment. Competition would increase *between* European regions as well as globally. However, the EU is not strong enough to force competition policy, restrictions reintroduced on movement of capital and labour. No implementation of fiscal 'level playing field' as is being proposed in COM(2005)24, p. 17) as a building block for implementing the Lisbon strategy.
- **Enlargement** of the Union will be slowed down or even stopped in this scenario, though the present candidate countries (Bulgaria, Romania and perhaps Croatia – even if with some delay, will join the EU). Even in the case of the member states having already joined the Union, derogations and restrictions will be extended. This obviously will give rise to dissatisfaction and frustration in the new member states and, as a result, they will be especially prone to turn to populist and nationalist policies. It is even more the case in the countries remaining outside the Union. Populist politicians in several member states will call for referendums on the accession of individual countries and the probability of the NON vote in some member states is rather high. The excluded countries will react with anti-European sentiments, with massive social and environmental dumping and with the neglecting of the border control of illegal border traffic to the European Union. The main victims of such policies will be the respective countries themselves. Nevertheless, they can inflict considerable losses to member states as well, especially those on the external EU border.
- **Environment and nature:** in certain countries Natura2000 and environmental quality policies are blamed for blocking projects vital for economic development and competitiveness, and support for these policies wanes.
- **R&D:** widespread criticisms of Framework Programmes (which require large scale European cooperation) result in initiatives to renationalise R&D, allowing researchers to intensify their work in their own language. The EU and national innovation policy strategies fail to be reformed. Their inefficiencies continue to exist. Policy failed to set a framework where scientific excellence shapes the core criterion for funding R&D. Furthermore, peer-review procedures in the forefront of funding for concrete R&D projects remain an exception rather than a rule. Notwithstanding, those research institutes and universities which already belonged in the early 2000s to the top ranked will be able to maintain their favourable position, but – due to the lack of institutional changes – the rest shows signs of mediocrity. Instead of establishing a generally R&D friendly institutional and regulatory environment, support continues to be distributed in an old fashioned manner, particularly for the benefit of certain established industries (not necessarily those with the greatest potential for productivity growth). As a consequence, the scientific basis of the European

knowledge society bearing the merits of excellence is smaller. The absence of EU-policies designated to support inter-regional cooperation in the field of R&D enforces this negative trend.

- Under the pressure of a number of member countries, the European support for regional development purposes has been cut considerably. A strong trend toward re-nationalization has taken place. The competencies and the budget for cohesion purposes at the EU level are shrinking. The spending for the enhancement of the innovation capability remains insufficient. The shrinking European budget for cohesion purposes might lead to a situation, in which for the less developed countries (particularly the new member countries) a strong regional policy, which would be necessary to support the regional innovation capability, is not affordable. On the contrary, richer countries which 'benefit' from the cut of the EU budget can afford spending for their universities, R&D facilities and interregional transport infrastructure. Meanwhile, there may be some doubt whether they would really re-allocate their previous transfers to EU-budgets to the poorer regions within their own country.
- **Regional policy:** apprehension of 'net payer' countries of the costs of enlargement is translated into first a more narrowly targeted approach (only the poorest regions receive aid) and then a gradual reduction of aid as these regions are 'far from home'. If regional policy in the course of re-nationalization is, notwithstanding, pursued, its impact remains unclear. The lack of sound efficiency oriented (non-spatial) policy strategies, focused on boosting entrepreneurship will lead to a situation where an – unavoidable – slow down of non-competitive industries is not sufficiently countered by establishing new job opportunities. Against the background of lacking efficiency-oriented policies, the likelihood is great that regional policy is not capable to induce regional convergence. This is due to the fact that, even if efficiency-oriented policy is outstanding, agglomerations – due to their 'natural' advantages – are likely to show the relatively best innovation capability, whereas disadvantaged regions, which often are branch plant economies, will tend to fall further behind. As a logical consequence of failing efforts to renew economic structures, the pressure is taken away from the workforce to adapt the skills to the rapidly changing requirements of the knowledge society.
- **Transportation:** the ambition of the EU to adopt a more strategic approach to designating new priority projects for TENs is abandoned. As in the 1990s, new projects are essentially those previously identified by member states and nominated for EU support. Enthusiasm for cross-border and other politically difficult projects wanes as the level of funding at the EU level is reduced.

2.4.2.5.7 Impacts

Since the ambition is to enter the economy scenarios in the MASST model, only certain qualitative and rather guarded statements can be made here regarding *expected* results. These will have to be borne out later by the quantitative results.

a) Aggregate economic impacts

According to current president Barroso, 'the 'costs of non-Europe' have been substantiated through a large volume of academic evidence. One can argue with the figures. But not achieving 'Lisbon' does have a cost. The best evidence can be found in the widening gap of Europe's growth potential compared to other economic partners' (COM (2005) 24, p. 5).

b) Other impacts

Changes in **rural development** will take place slower and in a different structure in this scenario than in the previous one. Agriculture ('Management of the natural resources') will continue to be one of the largest expenditure item in the EU budget. Vested interests of farmers and national politicians depending on rural voters will undercut any efforts to reform and restructure agricultural policy in the EU. Nevertheless, the overall relative reduction of the EU budget will restrict the volume of agricultural support as well. If national governments should want to maintain the level of support to agriculture, then they will be forced to contribute from their own resources. CAP, one of the entirely supranational policies of the EU will 'degenerate' to a mixed one. The first steps in this direction have been already taken during the last phase of enlargement, when new member countries were allowed to complement the direct EU support given to their farmers, and amounting to 25% of that of farmers in the old member states, with 30% from their own resources. In case of shrinking EU budget, it would certainly happen in old member states as well.

Nevertheless, in case of 're-nationalising' — partly or fully — agricultural subsidies, the competition in agriculture within the European Union will be transformed into a competition of agricultural subsidies, as was the case already long ago outside the European Union. Rich countries can afford to subsidise their farmers more than poorer countries. Consequently, agricultural production, employment and land use will decrease much more rapidly in less developed member states than in the more developed ones. Furthermore, the extension of environment-friendly land use, and engaging rural people in non-surplus producing agricultural activities also requires support. In absence of this support, land will be simply abandoned and exposed to different environmental hazards and to deterioration. In this scenario, the retreat of agriculture and agricultural land use will take place primarily in the less developed, poorer member states, differentiating land use not according to geography, soil and climate but according to the subsidising capacity of the respective member states.

This scenario will differ from the others in terms of **migration** and demography. One of the fundamental achievements of the European integration was the free movement of labour within the Union. It became subject of some restrictions and withdrawals during the last enlargement. Old member states have applied different derogations for different periods of time in this respect. It means that this policy has been partly 're-nationalised' in the recent period. Some doom scenarios of East-West migration frightened the public in Western member states. In some countries, politicians facing high domestic unemployment, bend to popular pressure.

The assumption behind this scenario is the continuation of this trend. Restrictions and derogations will be extended for longer periods of time. Meanwhile, a radical ageing will take place in most EU member countries, and labour — especially highly skilled labour — will become bottleneck of economic growth and development. If politicians will realise this situation late, and — especially — if they will act to facilitate labour movement and migration only with substantial delay, then the only possibility will be to attract migrants from outside the EU. Namely, ageing and natural decrease of population will take place in most new members even more dramatically than in the old member countries.

2.4.2.5.8 *The territorial image 2030*

Re-nationalisation and national isolationism are, obviously, most harmful for small, less developed countries, even if they are frequently most afraid of the 'big countries' imperialism'. Their market is small; their most important driving force is the assimilation of existing technology and organisational practices of larger countries. Consequently, economic development disparities will increase in the 're-nationalisation' scenario, to the disadvantage of smaller and less developed countries.

Simultaneously, disparities within countries might decrease for two reasons. First, leading regions cannot fulfil the breakthrough in the absence of intensive inflow of capital, knowledge and innovation. Secondly, lagging behind regions and agricultural regions will be more 'protected' from European and worldwide competition through national subsidization and bailout of languid enterprises owned by the state and/or managed by the national elites. But it can also occur that even disparities within countries will increase. It might be the case, if in the course of 're-nationalisation' of structural policies the national governments spend a considerable amount of money for universities, motorways etc. which de facto strengthens the agglomerated spaces whereas the peripheral areas might further fall behind. In sum, overall economic growth is the smallest in this scenario.

In this scenario, **urban development** will not transcend national boundaries, especially in less-developed member states. Cities in border regions continue to be in peripheral and disadvantageous position, since, at present, the trade between regions within the same country is about 80 times more intense than is trade between two regions which are in two different countries, and, in this scenario, this situation will not change substantially in the future (The four futures of Europe).

It would follow from narrowing down urban system development into the national context that capital cities of the countries would be in an outstanding position. They would remain the centres of national power, wealth and control. Nevertheless, this scenario is unfavourable even for capital cities of smaller and less developed countries. Their functions will reach only as far as the national borders. They will not be in the position to assume and fulfil European, even transnational central functions. They cannot be fully integrated in the network of European or World metropolises. From a European point of view they remain 'provincial' cities.

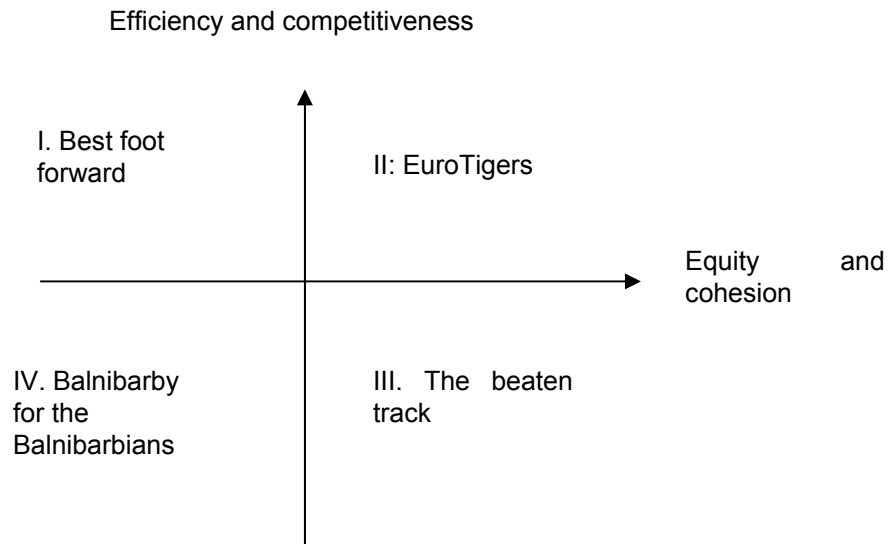
Because of the restricted mobility of foreign capital and the increasing economic role of national governments, administrative function of cities remains one of the most important factors determining the fate of individual cities. Administrative centres will be in a more privileged position, because resource allocation will depend to a significant extent on national and regional governments. These medium size administrative centres will be the main beneficiaries of this scenario while the position of both large metropolises and smaller cities will be unfavourable, compared to other scenarios.

2.4.2.5.9 Summary and conclusions

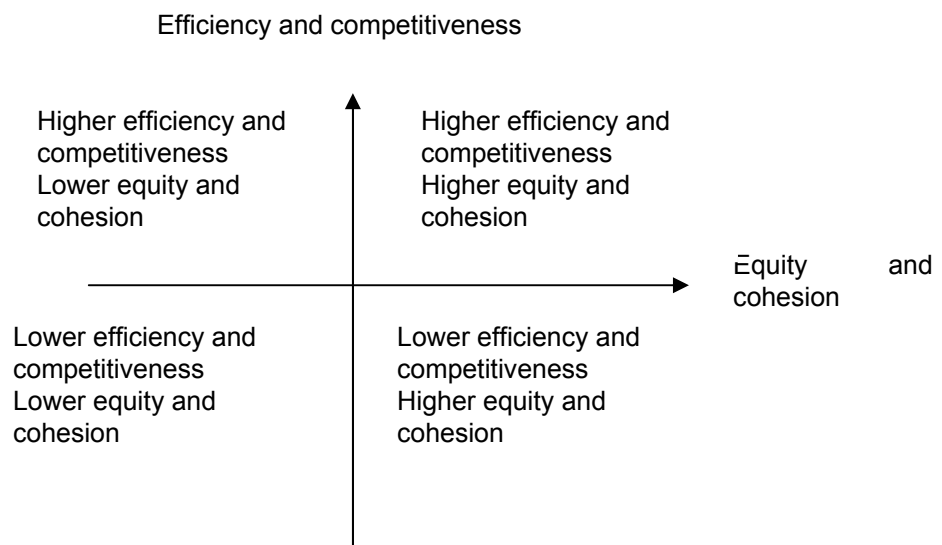
By and large, the combination of weak efficiency oriented policies with a weak cohesion policy at the European level coupled with re-nationalization tendencies in terms of structural policies, have ambiguous impacts. A smaller budget for cohesion purposes at the European level will deteriorate the chances of the less developed countries (and their regions) to catch up economically. Against this background, regional disparities between the states in Europe and within them are likely to become greater. Furthermore, the absence of a strong European structural policy which had a broad focus on R&D and training activities until 2013, will weaken not only the innovative capabilities of the disadvantaged regions but the overall innovation performance in Europe.

Comparative summary of the scenarios

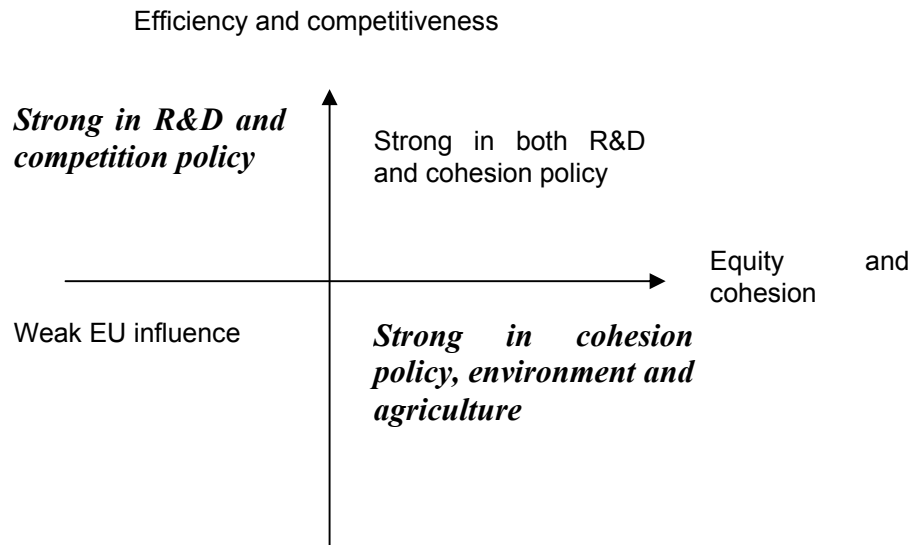
Provisional scenario names



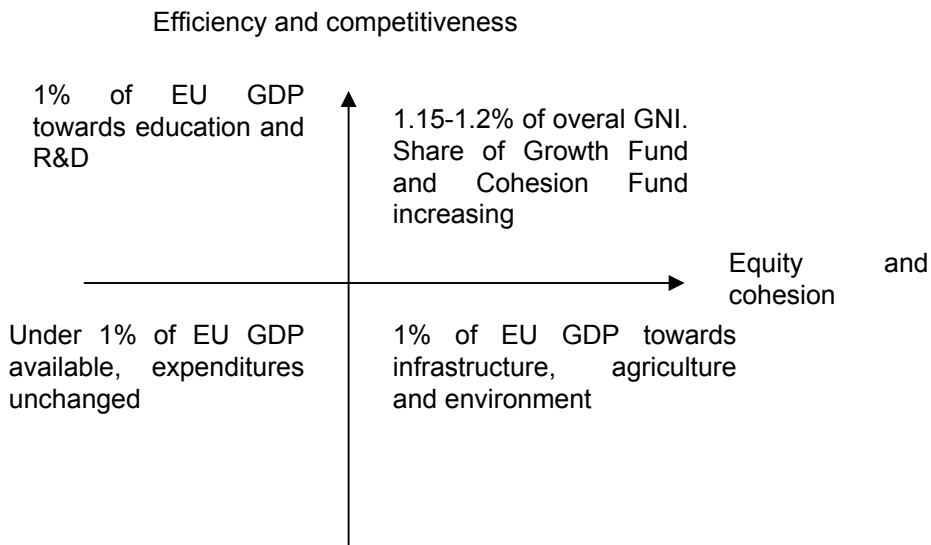
The main dimensions



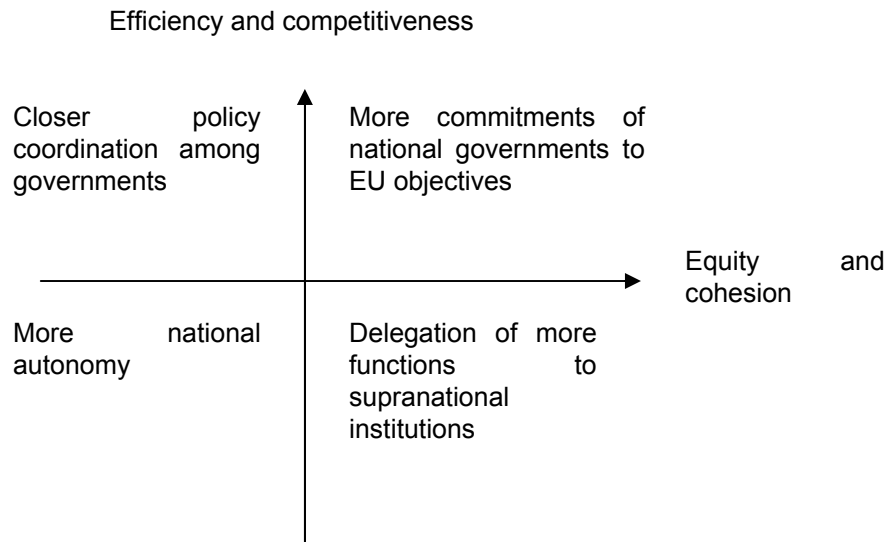
EU commitment



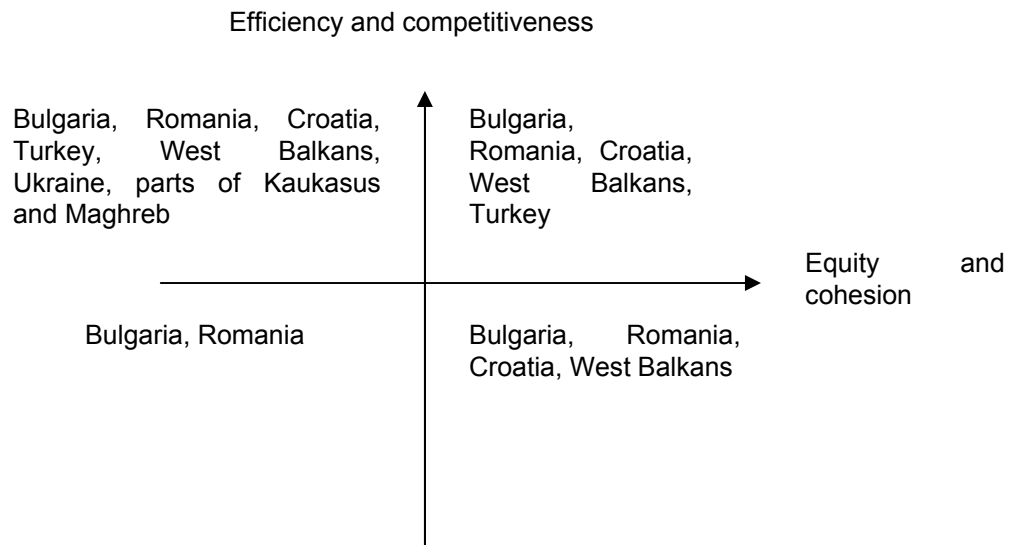
EU budget



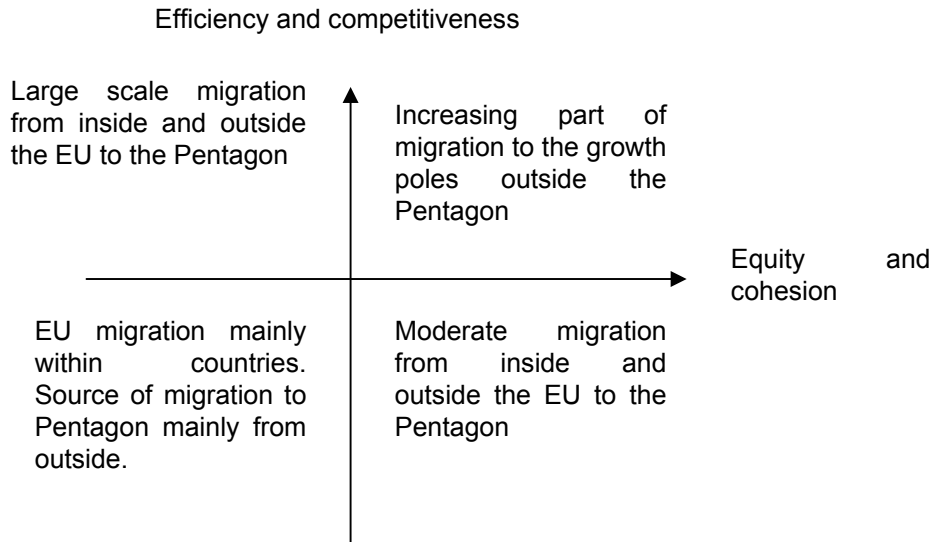
EU level governance (Type of governance method with increasing significance)



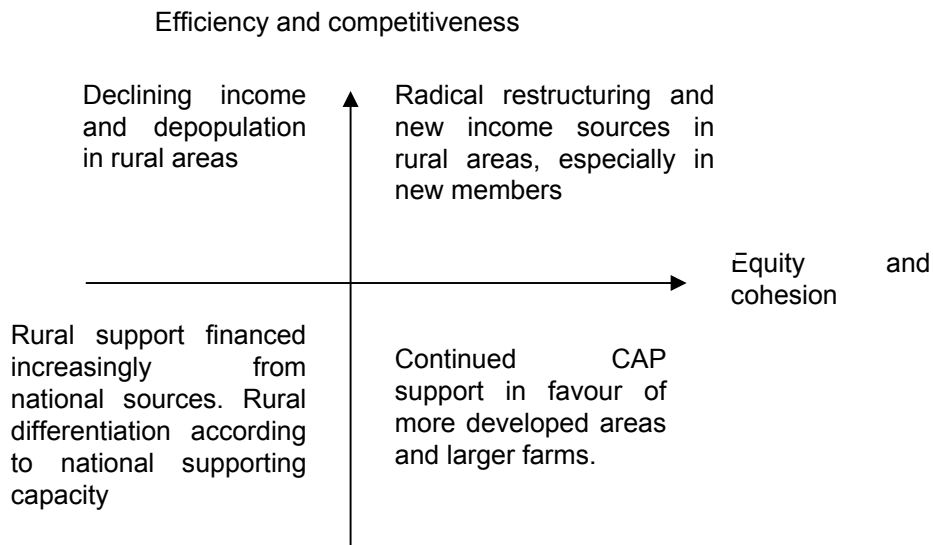
Enlargement



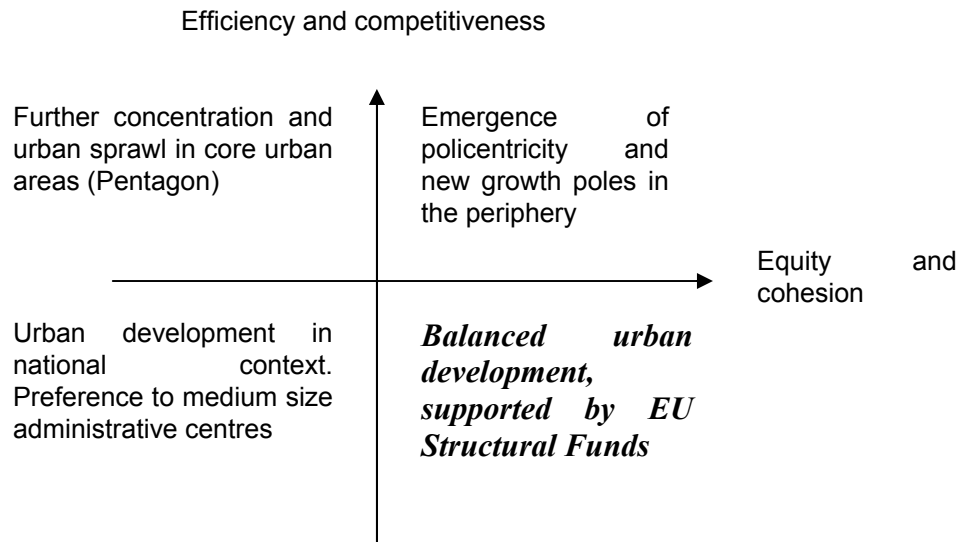
Migration



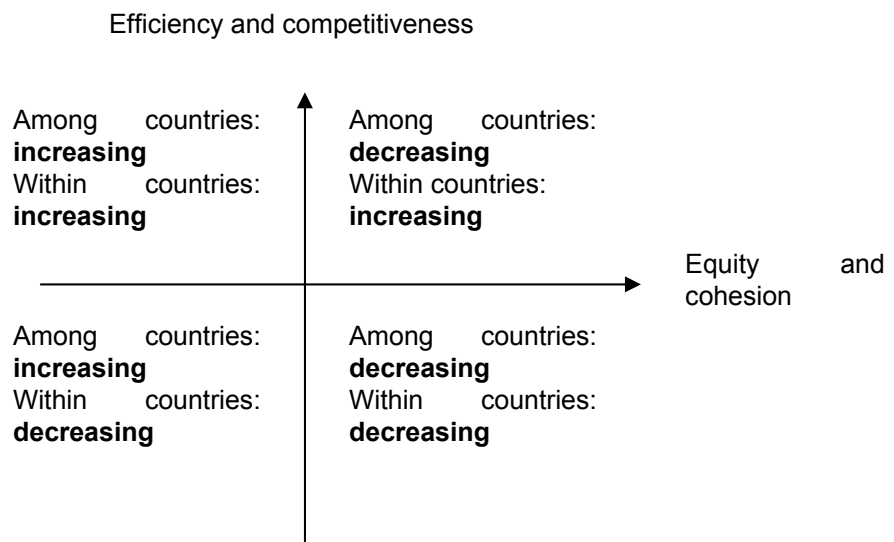
Rural development



Urban development



Regional disparities



2.5 Governance

2.5.1 Scenario base

2.5.1.1 Sources of information

A thorough literature review was undertaken at the beginning of the project. In order to ensure that we attained a broad picture of both the history and the current state of affairs in respect of European territorial governance, a wide array of contributions from various disciplines were consulted. Extensive use was made of official documents from the various organizations of the European Union, to ensure that we had access to the right tools needed to create and shape our scenarios. The 'White paper on European Governance' thus provided the cornerstone of our analysis in terms of the wider European context. The detailed list of papers and documents used can be found in the Bibliography to this document. The results of previous ESPON projects, particularly ESPON 1.1.1, have also been used to some extent. The final step taken in the shaping of this scenario-base document was to ask different 'national experts' for their comments.

It is important to note that the team has been in contact with ESPON project 2.3.2. However, this project has not yet advanced enough for us to see their results. This will hopefully be possible in the future, notably on the basis of the case studies to be undertaken by the 2.3.2. TPG.

2.5.1.2 The Current Situation

2.5.1.2.1 Introduction

By way of introduction when discussing the issues of territorial governance, it is necessary to discuss the historical basis of the concept. The relationship between the State on the one hand and the sub-national levels on the other is mainly defined by the various national traditions of State-building: Anglo-Saxon, Germanic, French or Scandinavian (See Loughlin 2001 for more precise information). Historically, the Nation-State has been the cocoon for the development of democracy in our societies. External events such as wars have fostered this tight linkage between democracy and the concept of Nation-State, which can be traced back to the French Revolution (Loughlin, 2001). Note should also be made of the fact that the European Union has also introduced a new type of governance to the Member-States. In effect it is a supra-national entity that is 'governed without government' (Kohler-Koch and Eising, 1999). As such, the EU, in itself, thus poses a significant challenge to traditional notions of governance. The desire for a move away from traditional forms of state-centred governance relates, to some extent, to the increasing inability – within the context of globalisation - of States to maintain public service levels and entitlements. In addition, the fact that most Western European countries have seen significant declines in voting turnout figures at elections over the last 25 years can also be used to suggest that a new type of public management is needed.

Thus, issues of territorial governance also relate to the reorganization of the powers, rights and duties at different levels of the state and beyond. Such relations can be of different natures, for instance, either economic or political. One of the major processes encountered in re-shaping such power relations is regionalisation, that is to say the empowerment of the region as a political and economic actor in most of the Member-states of the European

Union. Regionalisation was initially based on economic arguments, after which it took a more political turn, as the region itself increasingly became an important economic actor.

Before attempting to describe the current situation and relevant trends regarding territorial governance in the EU, it will be useful to highlight a number of important notions that will be encountered throughout this paper. First, **multi-level governance** aims, for a given policy, to involve the stakeholders inside each level of the relevant authority (Marks cited in Böhme *et al.*, 2004). This then is a rather different approach to governance than that of the hierarchical type, particularly in the way that it tries to put all of the stakeholders on the same level. It therefore gives the various actors an opportunity to exchange their views and interests thus creating a more relevant picture of the actions to be implemented. The second notion worth highlighting here is that of the **multi-sectoral approach** to policy-making, coordinating the resources and interests of several sectoral policies on a particular territory. The last and most important notion is the **territorial approach** to governance. This approach is focused on a particular territory, whether a region or a coalition of local authorities, involving multi-level governance and a multi-sectoral approach in order to achieve a strategic vision and integrated policy-making for this territory (Informal ministerial meeting, 2004). This 'tailor-made' approach reflects the complexity of the issues that are at stake here and the heterogeneity of the stakeholders, as well as their powers and responsibilities, throughout the EU.

The description of the current situation has been divided into three parts. First, we will discuss the European context. Governance at the European level has become a major issue for the future of the European Union, as it is now targeting the need for greater cohesion and effectiveness in its policies. In this first part, we will discuss the European context, and more particularly the characteristics of EU policies.

The second part of the paper focuses on the intra-national level, describing the evolution of governance inside the 29 countries that are studied (EU25 + Romania, Bulgaria, Norway and Switzerland). This is perhaps the most significant section, as we believe that the main changes occurred within each national boundary. This part shows that the sub-national levels have become more autonomous politically, institutionally and financially in most of the EU countries. Increasing sectoral coordination between the different levels also illustrates the need for a more integrated approach to the issues that each territory faces. This phenomenon remains however difficult to pin down, as the prerogatives at each level either overlap or are not clearly defined. As such we do not consider this to be a major evolution of the past 25 years, but instead see it rather more as a trend to be continued in the context of a scenario. It is the 'fragmentation of powers' within each country that has enabled major changes in the process of governance. The inter-sectoral perspective, aiming at a better level of coordination for the implementation of the different Community policies is a desirable development, though it remains as yet to be fully implemented. Finally, it is at the regional level that the most significant progress has been made concerning the inter-sectoral coordination of policies, and that is also why the regions are the main focus of this paper. Moreover, with regard to Regional Development Policies, new types of management, such as Public Private Partnership, have been used in order to share the burden of investment. Furthermore, participation has become a key word with processes aimed at involving private and non-governmental organizations, as well as the general public, in decision-making and policy implementation.

The final part of this chapter is dedicated to co-operation between territories, whether it is trans-nationally or within a Member-state. We will discuss how networks of co-operation have been created between different types of sub-national divisions (regions, counties or municipalities), often trans-nationally, and how they address such issues through either a sectoral or a territorial approach.

2.5.1.2.2 The European context

An introduction to the European approach to policy-making

Issues of European Governance have been much debated in recent years. One of the outcomes of this debate was the 'White paper on European Governance' approved by the European Commission in 2001. This paper provides a general overview of the matter, highlighting the most important issues the Commission considers as in need of attention if we are to improve governance in the EU. The debate flared up again in 2004 during the informal ministerial meeting on territorial cohesion, with its associated 'discussion paper' describing the situation and key principles to be followed in the future. Our team has used those two documents extensively in order to draw a relevant picture of the main issues in respect of European Governance.

It is hard to describe the process - from decision-making to implementation - linked to EU policies as it is highly complex, involving a large number of actors, and heterogeneous. One characteristic is the sectoral approach that has thus far been used by EU policy-makers. The array of policy sectors is broad, ranging from agriculture and energy to public health and tourism, to name but a few. Some of these sectors such as transport or the environment have significant and obvious territorial impacts. The sectoral approach was historically implemented to 'tackle a specific sectoral issue' (Discussion paper, 2004), but it is now perceived as being both inefficient and outdated, i.e. inadequate in the face of the future challenges that now face Europe. Some issues benefit enormously from a multi-sectoral approach. A striking example here would be environmental policy, which needs to be better coordinated with transport and energy policies, as well as agriculture policy. This stronger level of multi-sectoral coordination is needed to ensure a higher level of efficiency and the greater coherence of EU policies. In some specific cases, this kind of multi-sectoral approach has already emerged.

Another characteristic of EU policies would be their decentralised organisation. The 25 member-states are key actors concerning the conception of EU policies. Unfortunately, the States have had some problems in involving sub-national actors in this process. On the other hand, sub-national actors are often the main actors in the implementation phase of the EU policies. Notwithstanding this however, these sub-national actors, among them regions and cities, have not generally been given a clearly defined role in the shaping of EU policies, except in the case of EU regional policy directly targeted to those authorities. The share of responsibilities between the actors is different from one policy to another, which makes it even more difficult when attempting to facilitate the territorial coherence of policies. In order therefore to re-balance the process between the different actors, and with a view to fostering a multi-level governance approach to EU policy making and implementation, tripartite agreements have been created providing a framework for action involving the EU, as well as the national and regional/local levels.

In most cases, EU policies have enabled domestic changes to take place in most of the Member states. The focus on the notion of subsidiarity, that is to say that decisions shall be taken at the closest possible level to the citizens, has pushed some countries to open-up their institutions by creating new levels of governance, such as regions. EU regional policy has thus fostered the processes of regionalisation and decentralisation in many countries. Thus EU policies have been increasingly able to shape a new framework of action for the Member States and their regional or local authorities.

Cohesion of EU policies

The notion of territorial cohesion has helped foster new way of shaping and implementing EU policies. During the informal ministerial meeting that took place in Rotterdam in November 2004, it was agreed that a strong emphasis on a multi-sectoral approach to EU policies was needed, taking into account the diversity of resources and the particular needs of each territory (Discussion paper, 2004). This 'tailor-made' and integrated approach is believed to improve the efficiency of EU policies. As of now, few regions have actually adopted this kind of approach, though we can say that the inter-sectoral approach has become more integrated at the regional level over the last five years due to the progress made towards regionalisation and decentralisation. The need for the integration of the territorial dimension at both ends of the process, that is to say, decision-making and implementation, is currently developing in parallel to the notion of territorial cohesion. To be efficient, this dimension must be included in the already existing EU sectoral policies, and not be subject to a brand new 'EU territorial policy' (Discussion paper, 2004). Taking into consideration the specificity of each territory is seen as a first step in moving towards the better territorial cohesion of the EU. EU Regional Policy itself is, by nature, a territorial policy (Robert, 2001). It has developed projects aiming at the fostering of the greater cohesion of the European Union by targeting territories and their specific needs, one of its main levers being the Structural and Cohesion Funds.

European governance has witnessed some significant changes in recent years. It is generally felt that both the multi-level governance and the multi-sectoral approaches are needed in order to support the better coherence of EU policies (Discussion paper, 2004). Multi-level governance aims at involving the different layers of authorities that are at stake: i.e. the EU, the Member-States, regions, cities and municipalities. It should not however be perceived as a threat to the Member-states, but rather as an opportunity to share responsibility and accountability with other authorities. The multi-sectoral approach is about coordinating different sectoral policies in order to improve the efficiency of their impacts. These new trends in policy-making essentially point to a less hierarchical type of management, blending resources and skills from different actors.

The cost of the non-coordination of policies

Some recent studies have stressed the impacts of the non-coordination, or the lack of sectoral policy coordination. For instance, it is worth noting that the implementation of Structural Funds programmes is generally characterised by a lack of coordination with other EU programmes on the same territory, as they often overlap (Robert, 2001). Thus the non-coordination of policies can often lead to contrary effects.

An interesting example here is that of transport policy. The impacts of transport policy on economic and social cohesion can be contradictory depending on the sectoral policy from which they originate. Thus, the transport allocations from the EU Regional Policy have had positive impacts, whereas the allocations from the TEN-T budget line (EU Transport Policy) have been counter-productive in the context of economic and social cohesion (Robert, 2001).

This study also shows that the lack of coordination has a more important impact at the micro level (sub-regional, for instance) than at the macro level (i.e. the EU as a whole). The same study also stressed the influence of the timing of a territorial approach to policy-making, noting in particular that this approach is usually only taken into consideration at the later stages of the project concerned, that is to say, when the problems have already reached a 'worrying size' (Robert, 2001).

2.5.1.2.3 *The national context*

The last 25 years have witnessed some dramatic developments in respect of the issues of territorial governance in the European Union, (plus Romania, Bulgaria, Norway and Switzerland). This process has been driven by some important visions such as that of a 'Europe of the regions', which aimed at strengthening the sub-national level in the construction of the European Union. The notion of subsidiarity has also played a significant role in the evolution of European governance.

One of the most interesting developments in this respect is the creation and/or the empowerment, to a certain degree, of the regions. Indeed, since the beginning of the 1980's, the region has been increasingly seen as a relevant and legitimate stakeholder in the European governance debate. Before describing further the various national developments in respect of the evolving regional entities, it is useful to point out here that there are huge disparities both between and within countries. These disparities are manifest in terms of population, size, economic wealth, institutional status or culture, those being the most commonly stated. It is important to notice also that 'the regions' form a highly heterogeneous group (White paper on Multi-level governance, 2001).

Institutional regions have also gathered together in different organizations such as the Assembly of European Regions (1985) in order to develop a stronger influence on European decision-making bodies, with the Committee of the Regions being created in 1994 after the Treaty of Maastricht was ratified. The creation, in 1951, of the 'Council of European Municipalities and Regions' also show moreover that the importance attributed to the sub-national level, to some extent, even predates the birth of the EU.

Nonetheless, the path to achieving this vision is not easy to follow, even if most of the members of the European Union have shown a certain willingness to change their institutions in order to allow a more important role to be given to the sub-national representation. Different states have, thus far at least, reached rather different stages of regionalisation, decentralisation and devolution. Nevertheless, the fact that they have all, in their different ways, done so, stresses the importance of this trend. One of the main reasons for this rather heterogeneous implementation is the diversity of political institutions at the national level.

The differences in the pace of, and the preconditions for this evolution in each country, plus the recent accession of ten new members to the EU make it rather difficult however to undertake a purely chronological representation of events in this regard. To aid clarity and brevity the choice was therefore made to group the studied countries in terms of the family of state-type they belonged to. Indeed, even if some fundamental changes have occurred at the national level concerning the issues of territorial governance, as in Spain or Belgium, the evolution of the regions was bound to the existing national framework. The following typology is not exhaustive and must be seen as an aid to understanding the different paths chosen in each country. Furthermore, we have grouped the new members of the EU in the same category because the process of regionalisation is as yet too young for us to draw up a clear trend and to decide authoritatively to which category they belong, even if some of these countries have already moved some way towards one or other of the indicative models used.

The process of regionalisation represents an important step towards adoption of the territorial approach to policy-making. Regionalisation not only defines the political and administrative powers of the Regions, but it also helps define the Region as an arena for public debate (Keating in Le Galès, 1998). Regionalisation has, to some extent, encouraged a revitalisation of democracy by presenting new opportunities for participation in public life to existing actors. The newly empowered regional entities also often opt for New Public

Management and Partnership approaches to governance for a number of reasons, one of the most obvious being that they often do not have the resources to implement policies on their own. Private organisations and other stakeholders can provide them with relevant resources, both financial and human, which raises questions over the notion of ‘public service’ itself.

Over the last twenty-five years, the Member States have been faced with new challenges that have contributed to the phenomena described above with the provision of public services being at the core of huge changes in some countries. The privatisation of different public services, such as transport networks or postal delivery, has fostered a system of new public management, involving other actors such as local authorities or private partners, and giving more power to non-governmental stakeholders. The States have also been more aware of the need for the better coordination of their sectoral policies, and have thus been more willing to open-up their policy making systems to a more territory-based approach, a good example here being the discussion paper resulting from the Informal Ministerial Meeting of November 2004.

Our first typology relates to the ‘national context’ and differentiates states with regard to their current national political categories, as the process of regionalisation is mainly defined by national political structures. It is always difficult to put countries that are so different into the same ‘box’, but it is necessary here in order to give the reader a clearer perspective. At the end of the chapter, we have chosen to regroup the countries with another typology, based on the type of regionalisation that has been undertaken.

| | | |
|--|---|---|
| <p>Federal states Germany Austria Belgium Switzerland</p> | <p>Regionalized unitary states¹ Italy France Spain United Kingdom</p> | <p>New EU member-states and candidate countries Poland Lithuania Latvia Estonia Czech Republic Slovakia Hungary Slovenia Malta Cyprus Romania Bulgaria</p> |
| <p>Decentralised unitary states² Denmark Finland Netherlands Sweden Norway</p> | <p>Centralised unitary states³ Portugal Ireland Luxembourg Greece</p> | |

Adapted from *Multi-level governance: linking and networking the various regional and local levels*, published by the European Union Commission, May 2001

¹ Characterized by the existence of elected regional governments with constitutional status, legislative powers and a high degree of autonomy

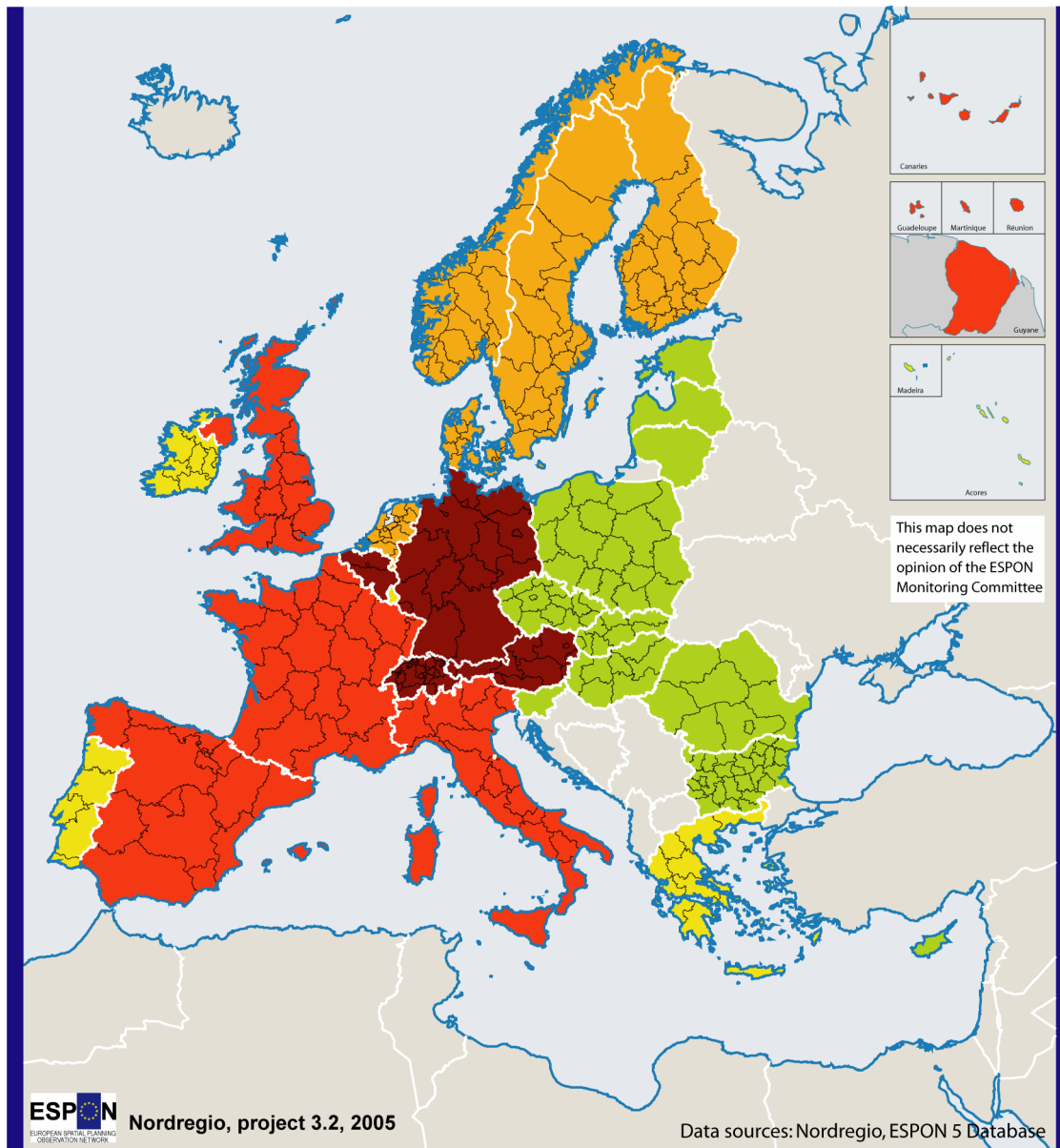
² States which have undertaken a process of reform to establish elected regional authorities above the local level

³ Regional levels may exist for administrative reasons but are subordinate to the central state

Table 17 Typology of the State structure used for the study

In each country, the sub-national levels and their respective evolution will be addressed not only in terms of institutional changes and policies, but also in respect of local identities and power relations between those levels. The map below is an attempt to clarify the geographical repartition of the States using the above typology. Moreover, it enables us to undertake a broad overview of the regional level in the ESPON countries. Those regional levels correspond to the various NUTS level, from NUTS 1 to NUTS 3. We have used here the definition of the regional level found in the literature of the Committee of the Regions (See the internet link in the Bibliography). For the sake of clarity, the regional level, of small countries, if indeed it exists at all, has not been represented on the map. This relates in particular to the cases of Slovenia, Lithuania, Latvia, Estonia, Cyprus, Malta and Luxembourg.

Structure of the States and definition of the Regions in the ESPON Countries



Adapted from the Workpaper on Multi-level governance published by the EU Commission 2001

- Federal states
- Regionalised unitary states
- Decentralised unitary states
- Centralized unitary states
- EU New member-states and accession countries

Figure 20 Regions and national structures

Federal states

Germany has been a federal state since the end of the Second World War and is now constituted, after the 1991 reunification, of sixteen *Länder*. The *länder* are in charge of the implementation of federal law on their territory, as well as having the possibility to legislate in all matters that are not of the direct responsibility of the state. The inhabitants elect the regional assembly, *Landtag*, by direct universal suffrage. In Germany, the *länder* have significant power, while their domains of competence can on occasion overlap with those of the federal state, for instance in areas such as justice and social welfare. In 1992, the *länder* were given a greater role in EU affairs, and in 1993 an agreement was signed between the federal government and the *länder* government in order to foster co-operation on those matters. In 2003, the federal government announced a modification of the taxation law in order to give local authorities greater power to make investments. The local authorities are directly responsible to the *länder*, each determining the local arrangements on their own territory.

The federal state of **Austria** emerged after WWI and was reinstated after WWII. As in Germany, the government of the *länder* is responsible for any matter that is not of the responsibility of the federal state, and for the implementation of federal laws. In 1983, an amendment to the Federal Constitution lessened the influence of the federal government on the *länder*, and their powers were consequently strengthened in 1984. In 1988, the *länder* were given the power to conclude specifically defined types of international treaties, mainly with neighbouring regions, independently of the federal state. Since 1998, more administrative power has been devolved to the *länder*. In 1999, an important pact was settled between the federal government and the *länder* stating that no financial burden could be transferred from the state to the *länder*. The local authorities are mainly empowered to implement duties devolved to them either by the State or the *länder*.

The confederation of **Switzerland** is composed of 26 sovereign *cantons* each having the power to decide the degree of autonomy of their constitutive parts. Switzerland became a federation in 1848. The confederation is also composed of 4 different language communities: French, German, Italian and *Romanche*. The *cantons* are historical entities and, thus, have a strong sense of belonging and identity, mainly based on the language spoken. In their current form however the *cantons* were created by Napoleon Bonaparte in 1803. The sharing of power between the three different levels (Federation, *cantons* and municipalities) is guaranteed by the Constitution and is driven by the notion of subsidiarity. The Federal Constitution of 1999 gave the *cantons* the freedom to act if not in contradiction with the Constitution. The federal level has a coordinating function and generally acts on issues of national interest. In terms of the *cantons* we are now seeing a discernable tendency towards regrouping in *Espaces* that highlight the desire for co-operation at the cantonal level. These *Espaces* are not a new institutional level, but instead show the willingness of the cantons to co-operate in order to optimize their response to some issues. The local level, constituted by nearly 3000 municipalities, often small in size, is deeply rooted in the citizens' identity. Fusions between municipalities are as such hardly possible due to this strong sense of 'belonging' at the local level. In 1999, the constitution was completely reviewed notably in order to clarify the domains of competence at the different levels, as well to provide for the introduction of the principle of sustainability. For instance, since 1999, the *cantons* have had the ability to sign international treaties with neighbouring territories.

The case of **Belgium** is rather different from that of the other federal states, as it was proclaimed a federation in 1993; the process of the federalisation of the state was launched in the 1970s. Before that Belgium was considered a unitary state with a provincial level that was supervised by the central government. This process has been generally long fostered

by the desire for greater autonomy by the different linguistic communities, particularly the Flemish-speaking one. This new status has of course had a significant impact on the regionalisation/decentralisation process. The sub-national level is divided into three Communities ('Communautés'/'Gemeenschappen' constituted predominantly on the basis of language i.e. French, German and Flemish) and into three Regions (Wallonia, Flanders and Brussels-capital). It is noteworthy to stress here however that the Flemish Gemeenschap and the Flemish Region have merged into a single entity. Both levels have legislative powers, acquired in 1980 in the case of the regions, and there are no hierarchical relationships between them and the federal state. Regions and Communities have separate prerogatives: broadly speaking, the Communities have decision-making powers on 'individual-related matters', whereas the Regions are in charge of 'territorial matters'. In 1988, greater powers were devolved to the Regions and Communities and the bilingual (French-Flemish) Brussels-capital Region was set up. In 2002, the supervisory powers of the local authorities, which have, by tradition, significant autonomy of action within their prerogatives, were devolved to the Regions.

As we can see then, the situation is diverse in the countries that have federal state status. For instance, after WW2, Germany became a federal state partly because this type of government could be used to limit central government powers in order to avoid a re-centralisation of the powers and the potential re-emergence of totalitarianism. Consequently, while the regions have extensive powers, a strong sense of belonging or regional identity, except in Bavaria and in some East German *länder*, does not exist. This contrasts strongly with the situation in Belgium where it is the strong sense of identity within the communities that has fostered the federalisation of the state. In the Belgian context then the federal structure helps to ensure the unity of the state by granting the regions significant political power. In federal states then, the regions are more important not only in terms of domestic matters, but also in respect of international co-operation. The case of Switzerland is however rather unique in this respect as it is a confederation (i.e. a union of several sovereign provinces within a common state). Switzerland contains within it strong identity pressures at the local level, which, for instance, led in 1979 to the division of the canton of Berne into two units, mainly based on linguistic considerations. As we can see, federal status does not prevent regionalist claims from arising, though it does seem to engender a certain degree of adaptability in the regional context. The new challenges that the local authorities now face have however pushed the municipalities into forming joint bodies in order to fulfil some of their tasks more efficiently. This phenomenon is particularly prevalent in Belgium and Switzerland.

Regionalized unitary states

At the sub-national level, **Italy** is composed of 15 regions, 5 regions with special status and two self-governing provinces (Bolzano and Trento). The regions were instituted in the 1950s. Each region can adopt its own status, with the approval of the national parliament, and each has legislative powers in all domains that are not expressly reserved to the States' prerogative. The Italian regions are not based on historical regions or identities, with the partial exception of some regions with special status that include particular linguistic minorities. The regions with special status are given significant extra legislative powers in a number of areas. In 1977, administrative powers were transferred to the regions and local authorities. In 1990, the principle of self-governance for local authorities was confirmed by law, while a new distribution of powers was also decided. A 1997 law transferred administrative powers and tasks down to the regions and the local authorities while also defining the administrative responsibilities that remained within the state's prerogative. In 2001, the legislative powers of the regions were further extended with the regions being granted a greater role in the EU decision-making process. The state no longer supervises the administrative activities of the local and regional levels. The Italian institutional framework has not however changed dramatically when it comes to the sub-national level,

though this level has been granted more powers and more freedom of action in their domains of responsibility. The implementation of the principle of subsidiarity has however extended administrative responsibilities at the local level.

1982 was the starting point for the process of the decentralisation of power in **France**. It was during this period that the region was turned into a territorial authority managed by an elected assembly. This was the result of the long debate on *décentralisation* spanning the 1960s and 1970s. At the same time, the President of the regional council was granted executive powers at the regional level. The evolution of the *départements* is somewhat similar, even though the prerogatives of the départements are more limited in scope. French regions are not based on historical regions, even if regionalism has arisen in some. Rather, they were created to bring an intermediate level of government closer to the citizens. Regional prerogatives were however mainly administrative to begin with. In 1983, responsibilities were divided between the different levels of government throughout the territory. The region has no control over the *départements* or over municipal fields of action. The first election of the regional councils took place in 1986. During the 1990s, the process of decentralisation continued apace. In 2000, the overseas regions were allowed to develop differently, particularly regarding the repartition of responsibilities between the state and the local authorities, but also in respect of the socio-economic development of the region. The island of Corsica was granted special regional status with broader competences for its regional assembly. In 2003, the legal personality of the regions was explicitly introduced into the Constitution, with the principles of devolution also emphasised, as was greater financial autonomy for the local authorities. At the local level, the possibility exists for the municipalities to create joint-bodies, *communautés de communes*.

The process of regionalisation in **Spain** was fostered by the desire by a number of historical communities and regions to acquire autonomy. In Spain, regionalisation was at the centre of the creation of the democratic state, which sought also to prevent the centralisation of power that had occurred under Franco. The regions of Spain can be specifically defined by history, culture or language in most cases. The quest for autonomy is political as the seventeen regions have executive and legislative abilities within the framework of their devolved powers. The political system of Spain can thus be defined as semi-federal, with a constitutional assertion in favour of the Autonomous Communities and a large array of powers devolved to them. There exist three different types of Autonomous Communities linked to the degree of autonomy given to these regions: 'historical' communities, communities with special status and 'regular' communities. In fact, significant differences exist also within those categories due to the diversity of the regions themselves. In 1978, the national constitution defined the nature of the autonomous regions as having a willingness to pursue political devolution. The statutes of the Autonomous Communities were adopted between 1981 and 1983, with the level of devolved powers varying from one community to another. In 1992, the powers of the Autonomous Communities were further extended. The process of regionalisation is still developing in Spain. As such, we have the attempt to redefine the notion of autonomy, after nearly 25 years. The mainstream debate aims at a better acceptance of the cultural diversity of the regions within the State. However, the debate tends to focus predominantly on financial and budgetary issues, with demands to readjust the regional fiscal balances. Finally, the role of the Spanish regions in the EU and their ability to partake in EU policy-making and EU affairs more generally is also part of this debate. In 1999 a significant level of political capital was invested in extending the powers of the local authorities.

Over the last 25 years the **United Kingdom** has seen much debate over the question of governance. This process finally came to fruition after 1997, which saw dramatic changes in terms of its governance structures, as a significant process of the devolution of powers away from the centre was undertaken. Given the particular history of the individual 'nations' of the United Kingdom and the peculiar nature of the UK's 'unwritten' Constitution, it is

however rather problematic to simply characterise this move as being from the 'national' to the 'regional' level (particularly in respect of Scotland, which was an independent nation-state in its own right until 1707). Nevertheless, the move towards the devolution of powers across the UK can be said to encompass a number of processes, each designed *sui generis* to deal with the specific needs of a particular area. That said, for the purposes of brevity and convenience if nothing else, it is possible to characterise the UK's devolution process in terms of the general dichotomy between 'national' and 'regional'. The level that has gained the most from this devolution process has been the 'regional' one. The regionalisation phenomenon is of a political nature and within the UK context is called devolution – power is devolved away from, but not lost by, the centre. In 1980, the country was still a highly centralised entity with a poor, indeed non-existent, regional level, after the initial failure of the attempt in 1979 to set up semi-autonomous parliaments in Wales and Scotland. The setting up of such parliaments for Wales, Scotland and Northern Ireland was however finally adopted after 1997. These new regional parliaments gained substantial legislative powers, particularly in Scotland. In both Scotland and Wales the new parliaments were granted legislative and monitoring powers over the local authorities. In Northern Ireland, a semi-autonomous assembly was established in 1998, though because of the continuing 'troubles' this has sat intermittently since then. The special status of London was also reinstated by referendum in 1998 with the establishment of the Greater London Authority. The Greater London Council that had existed previously was abolished in 1985. This new authority is institutionally considered to be on the same level as the regions. In most areas UK Parliament laws have primacy, though Scotland now has significant control over its own affairs (with the exception of defence, foreign and macro-economic policy). In England, the regions continue to have a rather more administrative purpose, though debate continues over the need for a greater level of autonomy. The Regional Development Agencies, created in 1998 and provided in 2003 with the ability to set up elected regional assemblies, are seen as a first step towards English regional government. Unlike Wales and Scotland however, regionalisation in England remains in its infancy, and with the exception of regions such as Cornwall and the North-East England there is little cultural or identity-based demand for change. Even here however in the North East of England in a referendum held on the issue of the need for an elected regional assembly in November 2004 78% of the voters strongly rejected the idea.

In this second category of countries, the situation is also quite diverse. In Spain and the United Kingdom, the regionalisation debate seems to be focused on the desire of some regions to be autonomous. Consequently, the most powerful actor at the sub-national level is the region. In that respect, Spain has gone further, though is also faced with a stronger context of cultural and linguistic regional identities. In France, the phenomenon of regionalisation was initially of an economic nature, as it was seen as a way to strengthen the economic adaptability of the regions in the broader European perspective. Regionalisation, which is a part of the so-called process of *décentralisation*, is the primary means for the regions to become more economically independent from the capital-city of Paris. The regions continue however to have a weak role at the national level. The process of decentralisation was thus also primarily administrative in nature at the beginning, though it is now becoming increasingly political. In all four countries in this category, regionalisation is also seen as a way to adjust the modern state to the needs of local particularism increasingly encouraged as a cultural response to globalisation. One of the ancillary purposes of the development of the regional level in these countries is the development of greater European co-operation, with regional entities becoming increasingly able to develop relationships with other actors outside the national framework.

Decentralised unitary states

The current regional structure in **Denmark** was set up in 1953, when the principal of administrative freedom for local authorities first appeared in the Constitution. The Faeroe

Islands and Greenland acquired autonomous status respectively in 1948 and 1979. Both autonomous regions have legislative powers over their territories. The rest of the country is constituted by 14 counties (*Amtskommuner*), which have extensive administrative powers and are in charge of regional development. It is important to note here that the counties do not represent a higher administrative level than the municipalities. At the beginning of the 1990s, substantial financial incentives were given by the central government in an attempt to achieve greater cohesion in terms of economic development across the country. The 14 counties will however, from 2006, be replaced by 5 regions. These regions will maintain responsibility for health care, spatial planning and regional policies, but will lose other tasks to the municipal level.

In **Finland**, the system of territorial governance can be described as bi-polar, since the municipalities and the State are responsible for regional development. The Swedish-speaking Åland Islands being an exception here, as this is an autonomous and demilitarised province of Finland. On the mainland, there is no intermediate level of self-government, although a comprehensive reform of Finnish administration took place in the 1990's. One of the main objectives of the reform was to create a simpler and more homogenous level of regional administration. As a result, 19 new Regional Councils were established in 1994 at the regional level, in anticipation of EU membership, as regional councils coordinate the use of Structural Funds in their territory, and also in reaction to the Europe of Regions-idea. Regional Councils are statutory joint municipal authorities operating according to the principles of local self-government as regional development and regional planning authorities. However, the municipal level has a central role in regional development, as municipalities provide services, maintain the infrastructure, compile land-use plans and try to create suitable environments for businesses. Plans exist to further reform the Finnish system of territorial governance, e.g. in 2004 a regional self-government experiment was launched in Kainuu region.

In the **Netherlands**, the regional level is composed of 12 provinces, each of which is governed by a provincial assembly, directly elected by the people, a provincial executive council and a direct representative of the State. The provinces have no legislative powers and any new regulations adopted must be in accordance with national laws. Due to the size of the country, the regional level is mainly driven by the needs of the larger cities. For instance, in 1995, four large cities signed an agreement with the state aimed at the promotion of social and economic renewal. The provinces have supervisory powers over the municipalities.

In **Sweden**, the most important sub-national actors are to be found on the municipal level. Responsibility for spatial planning rests with the municipalities, while regional development issues are coordinated by the central government's 21 County Governors. The elected counties, the *Landsting* are, as in Denmark, seen as regional municipalities with hospitals and public transport as their main responsibilities. In 1997, a law was passed recognizing the need for a new regional organisation. In 1999, four pilot-regions were implemented, though only two (*Västra Götaland* and *Skåne*) were established as regions with elected councils and responsibility for regional development issues in addition to the tasks of the *Landsting*. The government has not accepted the establishment of any other new regional experiments like this, but has opened for pilots in eight other counties where a model with an indirectly elected assembly was tested. There is currently an ongoing public enquiry on the issues concerning the division of labour between the state, county governors, regions and municipalities. Their report is due to report in 2007.

The sub-national level in **Norway** is strongly dominated by the municipalities. The 19 county councils (*fylkeskommuner*) represent the regional level, though they are on the same institutional level as the municipalities. One of the main tasks of the county councils is to develop the tangible and intangible infrastructures of their regions. The counties have no

legislative power and are thus mainly of an administrative nature. In the 1990s, emphasis was put on the creation of partnerships in matters relating to regional development. The future of the county councils is currently under debate. One alternative is to abolish them in favour of larger municipalities and a stronger state. Another alternative is to replace the 19 county councils with 5-9 regions, and give these new regions wider responsibility for regional development and the provision of public services.

In this category of states, which represent the extended 'Nordic family', the sub-national level is strongly dominated by the municipal level, the intermediate level being more or less on the same institutional level as the latter. Traditionally, Denmark and Norway have had the strongest regional levels, but the county councils are now being questioned in both countries. Finland has a two-tier system, but is now for the first time introducing elected regions as a test case. Sweden is similarly testing regions (the Danish model) and at the same time indirect regions based on municipalities (the Finnish model). The situation is currently in flux at the moment in all Nordic countries. In the Nordic family then the current bout of regionalisation is barely motivated by regionalism, as most of the regions with distinctive specificities have already been granted autonomy (Greenland, Faeroe Islands, Åland Islands).

Centralized unitary states

In **Portugal**, the role of the sub-national level is, with the exception of the overseas territories of Azores and Madeira, which were granted autonomy respectively in 1987 and 1991, basically administrative. In 1979, the 5 Regional Coordinating Commissions were established on the mainland. The regional bodies are appointed by the government. The administrative regions were set up in 1998. The main purpose of the regions is to both ensure coordination across different fields, and also to implement regional development policies. In 1998, a referendum regarding the continuation of the regionalisation process failed, which put on hold the further devolution of responsibilities to the regions. Lately, some reform has targeted the re-organisation of the local authorities. At the local level, the municipalities have a significant level of autonomy from the central government, especially concerning their financial resources. The future empowerment of the regions would then certainly lead to a 'new deal' with regard to the division of responsibilities between the regional and the local levels.

In **Ireland**, the regional level consists of 8 Regional Bodies and 2 Regional assemblies. The Regional Bodies were established in 1994, after the law was changed in 1991, while the regional assemblies were set up in 1999. The creation of this new level of authority was mainly aimed at the better implementation and monitoring of the European funds and programmes at the sub-national level, as well as at the better coordination of public service delivery. The creation of the regions is then intimately linked to wider regional development policy. The regional level does not have any legislative power of any kind. There has been no devolution of power from the central government to the regional level at this point. In 2000, regional boards were set up with the mission to develop a strategy for the socio-economic development of their respective regions. The municipalities have a very low degree of autonomy from the central government. The local level is then operating through Strategic Policy Committees that are cross-sectoral bodies aimed at the greater integration of issues pertaining to local development and to the local authorities. Different programmes, such as Area-Based Partnerships and the EU LEADER Programmes, tend to develop better cross-sectoral co-operation on the local level.

There is no regional level in **Luxembourg**, mainly due to the size of country. The intermediate level, the district, is merely an administrative unit whose representative is accountable to the Ministry of the Interior. Nonetheless, the 118 municipalities have a high degree of autonomy in their domains of competence. In 1988, a new law gave the local

authorities more autonomy. In 2000, inter-municipal entities were created in order to foster better co-operation between the municipalities. Yet the inter-municipal level is very active, as 70 *syndicats communaux* have been created in order to foster inter-municipal co-operation and funding on specific topics such as transport or environmental issues. It is worth noting that there is a regional level, but it is only dedicated to spatial planning (*Aménagement du territoire*) issues.

In **Greece**, the regionalization process was initially mainly administrative. In the mid 1990s however the regions gradually acquired a significant role in spatial development. A 1986 amendment to the Constitution explicitly paves the way for the de-concentration of the State's administration. Later in the same year, the regions were defined in such a way that they could better play a steering role in regional development matters. The 13 regions were then established in 1987. The turning point in the devolution process in Greece came in 1994, when two laws granted new powers to the municipal and intermediate (sub-regional) levels, giving them a stronger role in the socio-economic development of their respective territories, though the regional level continued to be an administrative unit. In contrast to the intermediate or municipal levels, there are no elected bodies at the regional level. Between 1998 and 2001, more powers were transferred to the regional and municipal levels. Both the intermediate and the local level are in charge of the socio-economic development of their territory. Moreover, the amalgamation, in 1997, of the then roughly 5000 small Communities and Municipalities into 1000 powerful Municipalities strengthened the role of the local level in spatial development. A growing role was also accorded to the Regions in the implementation of the 1st Community Support Framework / CSF (1989-1993), and mainly, the 2nd (1994-1999) as well as the 3rd (2000-2006) CSFs. This strengthened considerably the role of the Regions in spatial development.

In the countries studied in this sub-section regionalisation has not led to a political strengthening of the regional level, as the local level is still the most powerful sub-national level. The main goal for the regions is to support and coordinate policies that are being implemented on their territory, except for Luxembourg where it is more the size of the country that prevents the development of a viable regional level. Decentralisation is seen as an opportunity to achieve a certain degree of cohesion over the territory, as centralised administrations are believed to be less flexible and thus less able to create the necessary preconditions for socio-economic development.

The new member-states and accession countries

The introduction of 16 new regions in 1999 proved to be a significant turning point for the decentralisation process in **Poland**. Indeed, these new regions replaced the former 49-district structure that had been in place since 1975, and which is now only used for statistical purposes (i.e. within the context of ESPON 2.2.2). The main role of the new regions is to steer regional development in their respective territories. The Polish regions are the only ones in the new EU member-states to simultaneously have planning, administrative and self-governing dimensions. Regional Development Policies are then perceived in the main as strategic, with a long-term perspective, rather than as a succession of measures (ESPON 2.2.2). However, the local authorities have been granted substantial legal autonomy (1990), and can have competence in any matter that is not directly the responsibility of the State. The regional assemblies are elected by direct suffrage. The decentralisation process now underway in Poland has given more responsibility to the regions, especially concerning the implementation of policies on their territory. The array of regional prerogatives is broad: public education, especially higher education, health care, culture, the modernisation of rural areas, spatial development, environmental protection and public roads and transportation (ESPON 2.2.2). This new type of Regional Policy has, to a certain extent, been fostered thanks to the accession process (ESPON 2.2.2).

In the **Czech Republic**, the 14 regions, including the capital-city of Prague, were established in 2000. The former sub-national level, the district, which was created in 1990, was officially abolished in 2003. The region then became the only intermediate level in the country. The changes that occurred on Regional Policy in the Czech Republic have been, to some extent, fostered by the nature of European Policies, and particularly by the Structural Funds (ESPON 2.2.2). The role of the regions is not yet clearly defined, as it remains to be defined by a specific law, in accordance with the law of 1997 that created them. Thus, the main level of sub-national governance thus far has been the municipal one. The State has transferred some areas of responsibility to the municipalities, for example in areas like culture or energy supply. The thrust of the evolution currently underway undoubtedly however aims at greater regional decentralisation.

In recent years the **Slovak Republic** has undertaken to enact a significant set of changes in respect of regional decentralisation. Though eight regions that compose the country were established in 1996, they were only designated as self-governing territorial units on January 1st 2002 (ESPON 2.2.2). The transfer of competences from the central state to the regions was then continued throughout the period 2002 to 2004. The 8 higher-level self-governing territorial units were granted new responsibilities in respect of the development and administration of their territory. In 1999, amendments to the constitution defined the municipalities as the basic unit of local administration. Unlike the Czech Republic, Slovakia has kept, thus far, the intermediate level of the district, though their number will probably be reduced. The new regional reforms in Slovakia have split the area populated by the Hungarian minority over several Regions. On the questions linked to Regional Development, the partnership approach has been widely emphasized (ESPON 2.2.2).

Hungary is constituted by seven administrative regions created directly after the communist-ruled era ended, basically with a view to the de-concentration of powers. These regions are mainly administrative and statistical in purpose. In 1994 the competences of the counties and municipalities were further extended. The main role of the regions is to implement regional development policies.

In **Lithuania**, the role of the counties is mainly to implement the State's policies on their territory. In 1994, the definition of the powers delegated by the State to them was passed into law. In 2000, the notion of regional development was at the centre of the law that created the regions. In 2003, the concept of the decentralisation of powers aiming at a better distribution of functions between the different territorial levels was approved by the government. This decision paved the way for the more thoroughgoing administrative decentralisation of the State. The Lithuanian municipalities have extensive powers, whether those delegated by the state or their own, ranging from spatial planning and local development to environmental protection and education.

In **Latvia** and **Estonia**, the regions are administrative, as they are the representatives of the central government on their territory. Both countries have placed significant emphasis on the important role of the local authorities in their constitutions. There is no elected body at the regional level. Legislative power remains at the national level, though the regional and local levels are consulted in Latvia if a national law has direct consequences for them.

The recognition of the right to self-government was assured by the new constitution following the gaining of independence by **Slovenia**. In 1994, the establishment of 147 new municipalities was the first expression of this. In 1995 the State was divided into 58 decentralized administrative units. These entities are considered to be *the* regional level, even if they do not correspond in scope to the standard European region. Nevertheless, they are intimately linked to the central government, which can extend the responsibilities of each unit by common agreement. In 1993 the municipalities were given the right to join

together in order to create larger units more able to deal with matters of common interest, thus creating *de facto* if not *de jure* regional bodies. Thus, the creation of the regions is based on the voluntary amalgamation of the municipalities.

In **Bulgaria**, the 28 regions are mostly of an administrative nature. They are decentralised state administrations whose purpose is to implement state policies at the local level, to conduct regional policy and to coordinate state policy on the regional territory. This subordinate role is clearly stated in the constitution. In 1991, the basis for the implementation of local self-government (though not directly elected) was promulgated by law, though this was subsequently to be amended several times.

The 1991 **Romanian** Constitution set the basis for the division of responsibilities at the sub-national level. Until 1998, the country was divided into counties, representing the direct sub-national level, as well as into different types of local authorities (*commune, orase, municipii*). The main task for the county is to coordinate the public services that are considered to be of county interest. A 1998 law created 8 development regions. These entities are however rather limited in their scope of action, as they are not considered to be administrative or territorial units. Their creation is based on a signed convention by county councils representatives that define the regions' boundaries. Each region has its own Council for Regional Development, whose task it is to coordinate regional development strategies on its territory. The regions are also dedicated to the management and implementation of European programmes and funds. However, the decision-making process concerning regional development is still the prerogative of central governmental agencies.

The island of **Malta** is divided into three regions composed of 68 local districts. The regions are purely administrative as it is the districts that have competence for self-government. **Cyprus** (i.e. the territory of the officially recognised Government of Cyprus, not including the Turkish-dominated Northern Cyprus area) is divided into 6 districts, which represent the regional level, and 33 municipalities. The role of the head of the district is to implement central government policies in its territory.

In the new EU Members States, the most important level of territorial governance remains the local one. This is slowly changing however and some countries are heading towards the implementation of a more harmonised system of the redistribution of powers to the sub-national level. It should however be remembered that the vast majority of these countries are young democracies still developing their basic institutions. The idea of self-government has initially seen more power granted to the local level than to the regional one. For the most part, the regional level is seen more as a sub-national administrative unit, rather than a new level of governance. But as it was already described in this chapter, some countries, such as Slovakia, Poland and the Czech Republic, have undertaken important reforms that promise to devolve extended powers to the regions. The first step in this process was the creation of the regions as administrative entities, creating then a framework for further decentralisation. Moreover, the geographical size of some of the new Members States (i.e. Malta, Cyprus, Slovenia, Estonia, and Latvia) is such that there seems little need in these countries at least to have a fully viable regional level of power.

Summary

The analysis of what has occurred in each of the European Union members, plus Norway, Switzerland, Bulgaria and Romania enables us to have a more comprehensive image of the intertwined relationships between the different political and/or administrative levels in these 29 countries. As we have seen, one of the most interesting phenomena is that of regionalisation, as the most dramatic changes have occurred at the direct sub-national level. From this analysis and previous European studies arise 5 different categories of regionalisation summarized in the table here below.

| | |
|---|---|
| <p>Administrative regionalisation¹ Greece Portugal Estonia Lithuania Slovenia Latvia Romania Bulgaria</p> | <p>Regionalisation through the existing local authorities² Hungary Denmark Finland Ireland The Netherlands Norway</p> |
| <p>Regional decentralisation³ France United Kingdom Sweden Poland Czech Republic Slovakia</p> | <p>Regional autonomy (political regionalisation)⁴ Spain Italy</p> |
| <p>Regionalisation through the federate authorities Germany Switzerland Austria Belgium</p> | |

Adapted from *Regionalisation in Europe* published by the European Parliament, April 2000

¹ Creation by the State of authorities, which are subordinated to the government, with the purpose of promoting regional economic development

² Regionalisation occurs through the existing local authorities, originally created for different ends, take on functions connected with regionalisation

³ Refers to the creation or the substitution of a new territorial authority at a level above that of the existing territorial authorities, which is classed as a region

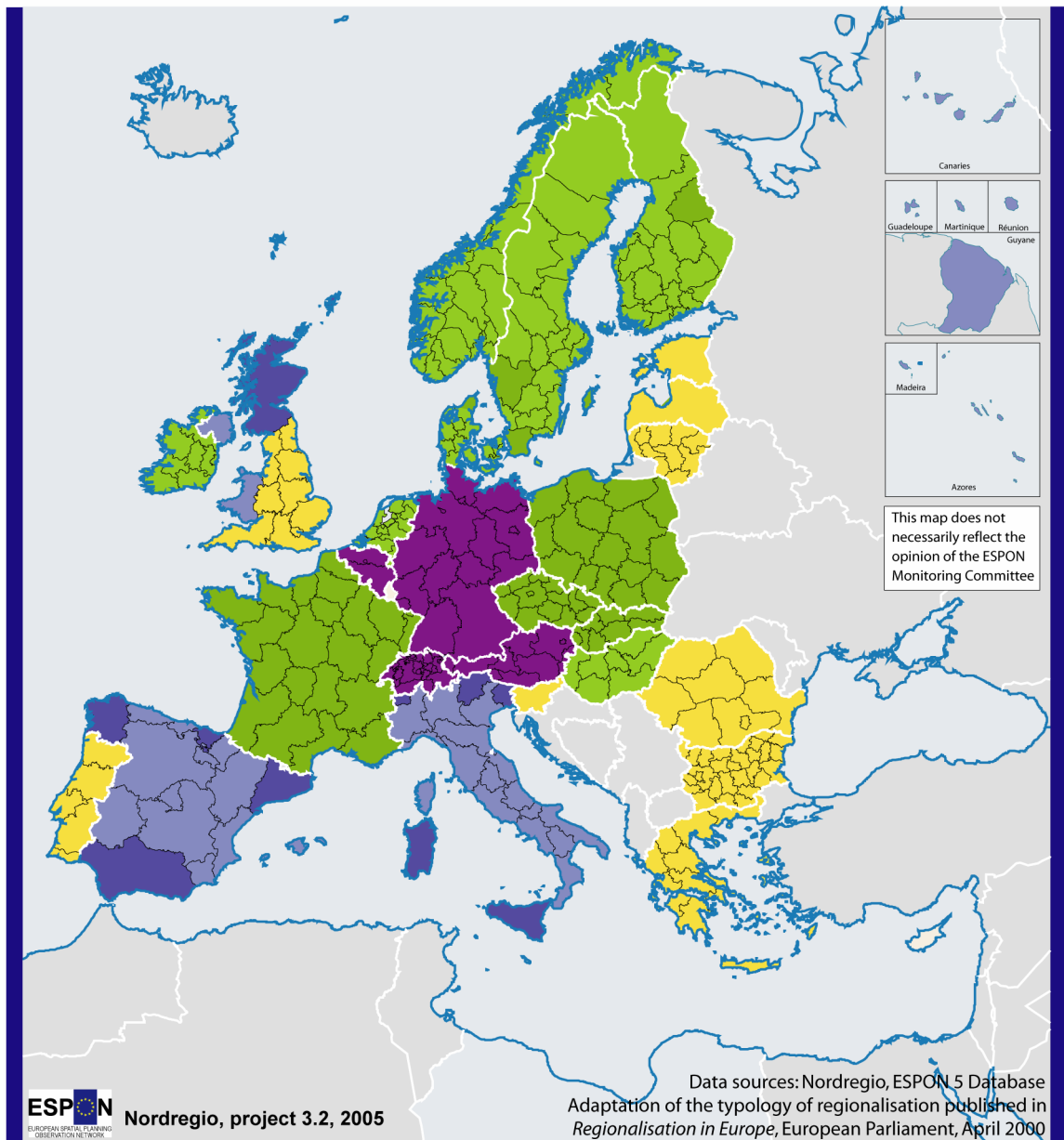
⁴ Model owing to the regional autonomy it allows, and considered as an end in itself

Table 18 Typology of regionalisation

A categorisation of the process of regionalisation across the EU+4 area is not easy to make. Indeed, the geographical or temporal extent of the process is difficult to measure. Moreover, some countries may belong to two or more categories for two main reasons. First, some countries experience substantially different types of regionalisation, giving more or less powers to different regions. This is a direct expression of the diversity in Europe. For instance, some *länder* in Germany experience administrative regionalisation within their territory, while Germany as a whole is classified as a federal state. Second, the process of regionalisation that is underway may be completed in some areas, while not fully achieved in other parts of the same country. Sweden is a good example of this, as different solutions are underway in different parts of the country. Thus, Sweden could potentially be placed in either the 'Administrative regionalisation' or the 'Regional decentralisation' categories.

The local level of governance is also evolving. In some countries, independently of the more general process of regionalisation that is underway, the municipalities have been faced with new challenges, especially concerning the provision of public services for their citizens. The tendency here then is for the municipalities to regroup, together with other relevant stakeholders. This is particularly true in the countries that have a high number of small municipalities, such as France and Switzerland. The rationale for this type of co-operation is the need to implement workable solutions to a joint or common issue.

Typology of regionalisation in the ESPON Countries



- States too small to have a proper regional level
- Administrative regionalisation
- Regionalisation through the existing local authorities
- Regional decentralisation
- } Regional autonomy
- }
- Federal states

Figure 21 Typology of regionalisation

2.5.1.2.4 The regional context

The regions seem to be the level of power that has and continues to be the most subject to questioning. In his introduction to 'Regions in Europe', Le Galès stresses the heterogeneity of the process of regionalisation in Europe (Le Galès, 1998). In some countries, the regions seem to be a historical intermediary level between the national governments and the citizens. In that case, the role of the region as a political entity is widely accepted by all actors from the government to the citizens. A classic example is that of the federal states, as described in the previous chapter. In other countries, the regions have been newly created, first as an administrative entity, that is to say, as an intermediary between the central government and the local authorities. The idea behind the creation of the region in such cases was less to give more power to an intermediary level, but rather to decentralise part of the responsibility for public service provision and administration to local entities. It is then important to be aware of the fact that what is called a 'region' often has different meanings, size, wealth or allocated powers across the various countries of the EU (White paper on Multi-level governance, 2001). The definition of a region is quite complex as it can represent different phenomena: functional, political, cultural or historical.

Politically, we currently see two main trends in terms of regional space. First, the Region is increasingly turning itself into a political arena (Keating in Le Galès, 1998). Issues are increasingly debated and dealt with at the regional level. The region has succeeded in gathering together a critical mass of actors, fostering co-operation between them. In parallel to the revitalisation of internal political debate, the region has also positioned itself as an external actor that is pursuing its own interests, independently, more or less, of the central governments (Keating in Le Galès, 1998). The rise of the region is seen by some to give a new dimension to the democratic process, being closer to the citizens and making it theoretically possible to ensure the better formulation of public policies at that level (Multi-level governance, 2001). Indeed, the regions are also perceived as a 'principle of organisation in civil society' (Keating in Le Galès, 1998). In most cases, the organisation of the region is not a simple reflection of the political entities above it (i.e. the States). They distinguish themselves by offering other approaches to management, such as partnerships, and increased co-operation. As such, the lack of resources and power devolved to a single regional entity might, in fact, help foster consensus-based actions and decision-making.

Viewed from the regional point of view, the cohesion goal of the EU is particularly relevant. Indeed, the disparities between regions, in a national or European context, often seem to be even greater than those between countries. The polarisation of economic and political amenities in a limited number of regions is obvious and creates significant imbalances. The representativity of the regions at European level is not equal, depending on the degree of responsibilities granted by their central governments. In this regard also, the most active regions are situated in the federal states. The competences allocated to the regions in the context of EU policy-making are also dependent on the domestic forms of government. In the policy fields that are not the exclusive prerogative of the States or the EU, the competences of the regions range from legislative (federal or regionalised states) or barely administrative (decentralised states) to no competence at all for most unitary states (White paper on Multi-level governance, 2001). Elected and non-elected regional entities do not have the same responsibilities and accountability towards their citizens.

The size of a region, whether by surface or population, is also an important factor when it comes to the weight of a particular region in the European system. Obviously, a German *länder* and a remote Norwegian region do not have the same influence and opportunities. Some peripheral regions, which do not have the same access to markets, lag behind the most central ones in economic terms, as well as remaining dependent on their own central government in terms of development. The notion of peripherality that has been studied by

some ESPON projects is interesting in this regard. The region is defined by each State as being the most appropriate entity in terms of the State's desire to find the most efficient and credible partner possible. For instance, dividing sparsely populated countries into small regions leads to non-viable regions. On the other hand, large regions in densely populated countries can lead to political competition between the States and the regions, which is also counter-productive.

In Europe, the regions have already become very strong economic actors, and thus are now seen as relevant units in the wider development of local comparative advantages. The process of regionalisation has enabled some regions to drive their economic development independently of the State. An interesting example here is the co-operative association of the 'Four motors of Europe', constituted by Rhône-Alpes in France, Baden-Württemberg in Germany, Catalonia in Spain and Lombardy in Italy, as they attempt to co-operate in the development of their regions as 'alternative choices' to their own national capital-city regions (Brussels, Île-de-France, London, Randstad...).

Another interesting aspect concerning the development of the regions is the issue of identity. Some regions have strong cultural or historical roots, which see them garner strong support from their citizens. Such regions can be found in almost all European countries: Corsica in France, Flanders in Belgium, Scotland in the United Kingdom, and the Basque country and Catalonia in Spain being but the most obvious example. In the cases mentioned above, the identity of the region has influenced the development of the region as a political entity. It is then not surprising that such regions often tend to ask for an autonomous status within the nation-state. The opposite can also be true, however, with new regions being created and their identity constructed as a platform for particular political interests.

Bearing in mind the potential diversity of the region, as a territorial entity, is essential then when dealing with governance in the EU, because it enables us to define more effectively the policies to follow, the particular needs of each region and the participation levels that can be expected. A territorial approach to governance is then directly linked with this nuanced understanding of the specificity of the region, compared to other levels of authorities.

2.5.1.2.5 Co-operation between territories through national or EU incentives

Co-operation between territories is now a very important aspect of Territorial governance. It has been greatly enabled by incentives created at both the national and the European levels. As described in our previous chapter on the 'national context', political and administrative evolutions in most of the countries studied have enabled the local authorities to take a more pro-active approach to developing their territory. On the other hand, trans-national co-operation through European programmes such as Interreg, Phare or Leader have also played an important role in creating networks and fostering co-operation between cities, counties and regions.

Within the national borders of the EU member-states, partnerships vary greatly, from small, single-sector networks to large multi-sector networks, though they do not have full executive powers. However, they represent a strong lobby and advisory body for the decision-makers. The ESPON 1.1.1 project has noted the main objectives for inter-municipal co-operation: strategic development, project orientation, networking and advocacy. Such partnerships give the opportunity to municipalities to express a common vision, beyond the established administrative borders and pool their resources, whether tangible (labour force, finances...) or intangible (knowledge, networks...). In some countries, co-operation on certain issues is perceived as simply attaining the benefits of a more optimal size in tackling common problems. Unfortunately, inter-municipal partnerships are mainly drawn up on a

sectoral basis, focusing on one core activity (environment, transport...). Nevertheless, most countries have now implemented new contractual arrangements giving the municipalities the ability to gather together within specific types of partnership in order to define a common project and a vision for their territories.

Cross-border co-operation is the most frequent type of trans-national partnership. Programmes, such as Interreg or PHARE, were mainly created with Community funds (i.e. the Structural Funds). These programmes have enabled their participants to establish networks of co-operation, share information and develop 'best practice' indicators, as well as to focus on common or similar problems (ESPON 2.2.1). For instance, ESPON 1.1.1 has clearly shown the importance of such networking potentialities especially for medium and small towns. As such, we can see that the United Kingdom, the Netherlands and Belgium represent an area with a dense network of cities involved in the Interreg programmes. In other countries, such as France however, the pattern of co-operation seems to be more polarized to specific large cities (Lille, Paris). The main fields of co-operation noted in ESPON 1.1.1 are economic, spatial and transport strategies. Thus the Interreg programmes are of importance for the development of coherent spatial strategies across a territory. This territory is not bound to actual administrative borders, but rather it is rather supposed to represent a coherent functional entity drawn up thanks to efficient networking. These programmes however rarely have visible spatial impacts, except for infrastructure-targeted projects. One good example of integrated cross-border co-operation is that taking place in the Öresund area (Copenhagen-Malmö) where the new bridge has physically connected both sides of the strait and helped in the development of coherent strategies concerning the environment and spatial planning for instance. The extent of the level of co-operation is generally however restricted to a particular sector: the Lyon-Geneva-Grenoble-Lausanne area focused on health and science, Edinburgh-Glasgow on the Forth-Clyde canal and culture. Trans-national programmes have also played an important role in the integration of the new member states after the latest EU enlargement.

2.5.1.3 The trends and the identification of the driving forces

The description of the evolutions that occurred at the different levels of power (European, national, regional and local) has enabled us to distinguish some trends that are currently ongoing within the theme of 'territorial governance'. From these trends, it has been possible to draw up internal driving forces. Our model then predicts that 'territorial governance' both in the past and in the future has been/will be driven in the main by these forces, without taking into account other external forces such as globalisation or diplomatic tensions.

2.5.1.3.1 Political trends

The devolution of political powers to the regions is a significant step in terms of territorial governance. The regional entities are in most cases led by elected assemblies that provide greater accountability to their citizens and garner more responsibilities to that level of government. This evolution has developed at different speeds in the countries studied: some had such assemblies in the early 1980s, while others still do not have them. It is important to note in this context also that many new EU member-states have now begun to create such regional assemblies, thus confirming the general long-term trend.

Co-operation between the different levels of government has also become a major trend. It is now widely acknowledged that the State cannot pursue policies on its own, without including other actors. It needs the other governmental actors in order to coordinate and implement domestic policies. Debates are now occurring in many countries over the redefinition of the prerogatives of the regions and the municipalities, and over the identification of the issues that do not necessarily need to be handled by the State. The use

of contracts between the States and the sub-national level, for instance in terms of the provision of public services, is a commonly used method for such a co-operation.

2.5.1.3.2 *Functional trends*

During the latest 25 years, the regions have considerably increased their economic weight within the national and European contexts. The less dominant role of the States in the marketplace has pushed the regions to develop their own economic comparative advantage and to compete with each other.

Better co-operation on economic activities, such as labour markets and SME networks, has also been an interesting development that has significantly improved the functional integration of territories, whether inside a country or across a border. In most countries, new institutional frameworks have been created to enable the municipalities to create joint entities in order to coordinate their efforts on certain issues. The fact that these types of partnerships are based on voluntary adhesion enhances a more flexible attitude towards policy implementation, but it can also lead to the exclusion of the most disadvantaged regions.

The Europeanization of the sub-national level is also an interesting trend. Thanks to EU Funding, cross-border regions (or municipalities) have managed to collaborate, exchange information and determine 'best practices' thus finding better solutions to joint problems. Such developments give cross-border territories that are actually single functional regions new opportunities to put in place a legal framework of action.

2.5.1.3.3 *Social trends*

On the social side, it seems that the arenas for debate or the framework of actions have evolved considerably over the last 25 years.

Firstly, a new type of local governance has been put in place in most of the countries studied. We have also seen, given the ongoing process of privatisation, a strong decoupling between the provision of public services and political representation. New Public Management or Public Private Partnerships are now increasingly used in dealing with public service issues. This opening-up of the decision-making process to actors other than the traditional institutional or political one often throws up new possibilities for action, mainly for private actors and non-governmental stakeholders. These developments also however herald the emergence of potentially vexing dilemmas between the interests of particular groups and the general public interest.

This New Deal in terms of public service provision has created a move towards a market-oriented approach as political actors devolve responsibility for the provision of such services to contracting private companies. This often delivers to the political level a more flexible financial system in sectors where significant investments are needed (transport for instance), but also diminishes the range of action since the state has to take into account the interests of private investors.

The general public has also demonstrated a certain willingness to meddle in such partnerships. Participation is then becoming a major issue for the goal of 'Good Governance'. There is as such a discernable shift now occurring in the participation process with a significant decrease in public participation in terms of traditional methods of participation (i.e. elections) but an increase in participation via 'consultation'. However, this phenomenon leads to the question of legitimacy that is attributed to the different levels of government and to the results of such, often selective, consultation processes, which are sometimes used as simple 'façade' for political legitimisation.

2.5.1.3.4 Cultural trends

The recognition of local specificities is also a major development in terms of the issues of territorial governance. It puts far greater emphasis on the fact that the European territory is highly diversified, and that each territory should be handled via 'tailor-made' policies. In some countries, the teaching of local and regional languages has recently been included in educational programmes that are increasingly designed to better match local or regional needs. The unity of the Nation-state was often translated in terms of the homogeneity of the national cultural landscapes. Cultural diversity is however now perceived as an asset and is thus more accepted, if not promoted.

2.5.1.3.5 Towards a definition of the driving forces

It is interesting to note that the trends described above have not run concomitantly. It is however the combination of such trends that has spurred the issue of territorial governance to assume ever greater importance over the last 25 years. For instance, these social trends have been nurtured by the granting of new responsibilities to the regional and local authorities. Political devolution has also, in some ways, been fostered by public implication in the definition of culturally diversified nations. As we can see, the different trends are all tightly intertwined with each other.

However, the analysis we have made has led us to the definition of two main driving forces relevant for our scenarios.

The first driving force is the devolution process and the empowerment of the region. This force is helping having a greater vertical sharing of the responsibility, thus fostering more integrated multi-level governance. The application of the principle of subsidiarity has been important in developing the regions, as it has made it possible to have a greater strategic approach to regional development, closer to the needs and specificities of each region.

The second driving force is a strengthened territorial approach to policy-making, whether at the European or the national level. This force helps reinforce the objectives of EU cohesion policy by making EU policies more efficient. It helps generate greater flexibility from the conception to the implementation of policies.

These concrete driving forces obviously have to be seen in front of more fundamental evolutions including the appearance of the neo-liberal economic paradigm, stressing the importance of regions as framework of business activities and reducing the role of the nation-state to that of guardian of the markets, and the end of the cold war and the loss of national unity it entailed.

2.5.1.4 Future trends

Our analysis of the most important developments of the last 25 years has enabled us to pinpoint the major trends and draw out their driving forces. A continuation of these trends is based on territorial co-operation and economic development.

The future trends will certainly stress the importance of the functional dimension in order to shape the policies of each territory. The increased level of co-operation between territories, whether they belong to the same State or not, will enable us to develop a renewed perspective on policy-making. As it has already been witnessed in some countries, these territories are now better able to define a common vision and to draw upon joint resources in order to tackle a specific problem.

Another main driver for the future, besides that of territorial co-operation, is the economic success of the regions. The new prosperity witnessed in some regions seems to be more relevant than the endless debate on autonomy and regionalism. The debate is then shifting from a political to a functional one. The legitimacy of the region is seen through the lens of prosperity with obvious drawbacks for those regions that are not successful but are now given the sole responsibility of this failure. In order to replace the welfare-state conception of prosperity, the region is blending the social actors together and giving the private and social organizations the opportunity to act and to create a new approach based on partnership. The States welcome this evolution of the regions towards prosperity-driven actions, since it relieves them of the responsibility to care for the regions through national redistribution.

2.5.1.5 Summary

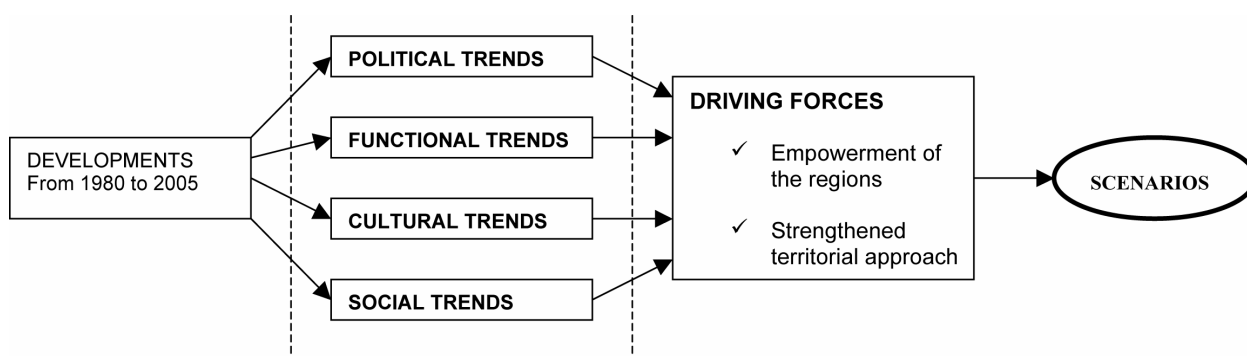


Figure 3: The Scenarios baseline at a glance

The main purpose of this scenario-base document was to create a broad picture of past trends and to discern the nature of the driving forces that will drive our scenarios. In order to make things clearer to the reader we have summarized these trends and driving forces in the figure above.

The figure identifies the different steps that occurred in the writing of this paper. Firstly, we described and analyzed what happened over the last 25 years regarding our theme of 'territorial governance'. This section was done mainly via a literature review, but it has also seen the welcomed participation and co-operation of some of our co-partners in the ESPON 3.2 project.

From this point, we then identified the basic trends and distilled them into the two major driving forces.

Using those driving forces and their possible evolutions we proceeded thereafter to compile the two plausible and coherent scenarios that form the second part of this paper.

2.5.1.6 Questions to the expert panel

5-10 questions concerning your theme for which you would like some feedback from the experts

- How can we assess and measure the effects caused by the shift from sectoral policy-making to territorial governance?
- Does the political empowerment of the regions have had a measurable impact on the regional economy? Which are the most favoured regions?
- EU Regional Policy is pushing for the creation of administrative regions in countries where they did not exist before. What are the potential benefits of having a three-tiered government system instead of a two-tiered one?

- Is a coherent territorial approach to policy-making feasible at the micro, meso and macro levels? Wouldn't it raise more problems than solutions when trying to integrate them?
- As regards the Region as the intermediary level between the national and local authorities, we wonder if 'coalitions' of municipalities are not a better answer to territorial governance than the often 'top-down' creation of Regions.
- The process of regionalisation that we have witnessed shows that there are huge disparities of powers allocated to different Regions throughout Europe, and even inside member-states. Will this make it more difficult to handle the issue of cohesion in Europe?

2.5.1.7 Bibliography

This text is a compilation of past studies concerning the process of regionalisation in Europe, most of them published by the European Union entities.

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2.5.2 Scenarios

2.5.2.1 Introduction

The analysis contained in the Scenario base document on the 'Issues of territorial governance' led us to the definition of the two major driving forces: 'Empowerment of the regions' and 'Strengthened territorial approach to policy-making'. The scenarios that will be developed hereafter relate to these two axes, creating different potential development paths. As the figure below illustrates, four alternative scenarios can be extracted. The hypotheses of each of the four alternatives will be described in the following chapters, but only two of them will be extensively analysed for reasons that will be briefly explained below.

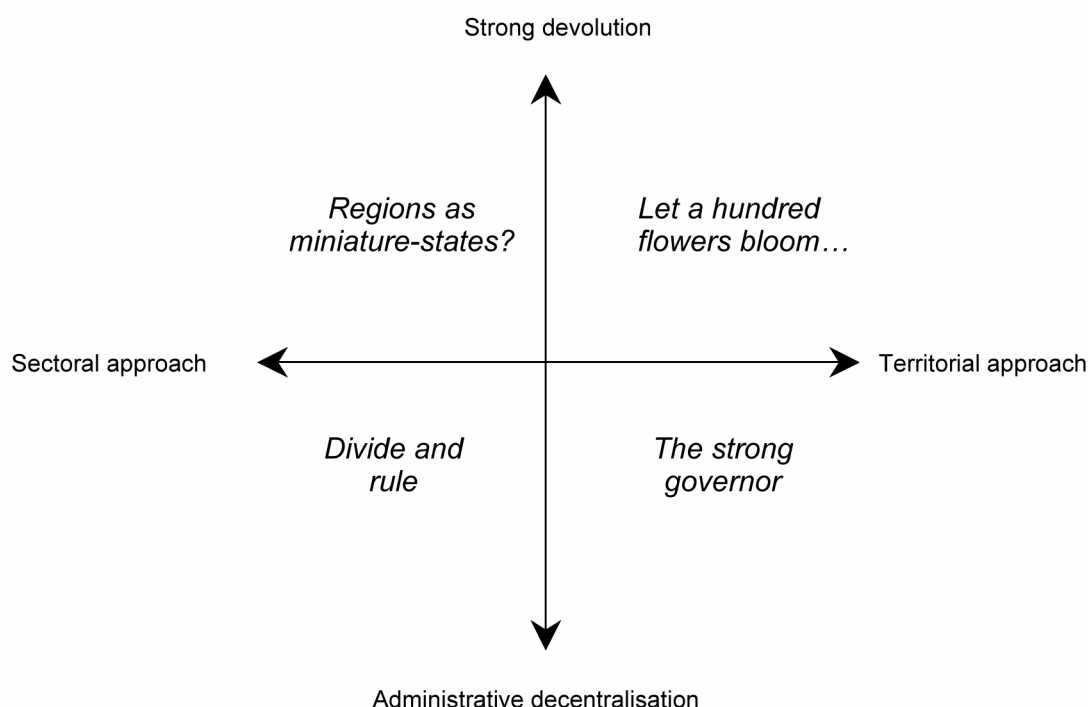


Figure 22 Scenarios diagram

2.5.2.2 Scenarios category

The scenarios chosen are of the **prospective policy** type, following the definition given in the ESPON 3.2 First Interim Report: '*Prospective policy scenarios (...) are based on the hypothesis that changes would occur in one or more areas of public policy. The aim of scenario building here is to construct territorial images which might be resulting from these policy interventions*'. The analysis of the past and present situation will be the starting point of the process of scenario making. The scenarios are constructed upon the aftermath of changes in policy represented by the two axes. The first axis, 'Strong devolution / Administrative decentralisation', illustrates the choice between administrative decentralisation and political devolution. The second axis, 'Sectoral/territorial approach to policy-making', is the graphic representation of the choice between a sectoral approach and a territorial approach towards policy-making at the different levels of government.

2.5.2.3 Hypotheses underlying the scenarios

2.5.2.3.1 *Let a hundred flowers bloom...*

Member States, with the support of large portions of the population, grant the regions more power, including some degree of autonomy, and better accountability (elected regional assemblies) to their citizens. The importance of a territorial approach is emphasised at the different levels of policy-making. The coordination of sectors and levels of governance is perceived as vital to the achievement of the goals of competitiveness and territorial cohesion.

2.5.2.3.2 *The strong governor*

The process of devolution is halted, first by few States, then by most of the rest of the EU countries. The States reinstate themselves as the most relevant level of action for policy-making. Concerned by the need for better management of their territory, they are not ready to decentralise administrative functions to the regions. As an inspired leader, and with the help of powerful regional governors and States agencies, the State develops an adaptative territorial approach for each region. The regional and local stakeholders are involved in the decision-making process, but only in an advisory capacity and thus with little possibility for influence.

2.5.2.3.3 *Divide and rule*

The States claim back powers previously devolved. They now increasingly see the most relevant level in territorial terms to be the national one. As such, a return to sectoral policy-making is witnessed in most of the unitary states of the EU. The regions of the federal states do however retain limited legislative powers concerning their role in European affairs. The States do however show a willingness to include other actors in the decision-making processes, mainly for the sake of coherence, thus a multi-level type of governance is fostered within each sectoral policy, though the national governments retain the lion's share of responsibilities as well as a veto power over decisions.

2.5.2.3.4 *Regions as miniature-states?*

Given significant powers from the nation-states and greater legitimacy by their own people, the regions attempt themselves to tackle the major problems they face. The quickest way to do this is to continue to reinforce the sectoral approach to policy-making, but with an added emphasis on the multi-level approach to governance, that is to say, the better coordination of action between the EU, and national, regional and local authorities.

2.5.2.4 Scenario line

2.5.2.4.1 *From 4 alternatives to 2 scenarios*

The path to the scenarios has thus far outlined four alternative scenarios for our theme of 'issues of territorial governance'. We believe however that all four scenarios are not of equal interest in term of the coherence of our work, and thus we will then only detail two of them. As the purpose of this exercise is mainly pedagogic, and in order to avoid producing 'mid-way scenarios', we have decided to focus on diametrically opposed scenarios: *Let a hundred flowers bloom...* and *Divide and Rule*. We believe that the two scenarios chosen for further

analysis display potentially interesting and significant impacts because they dramatically shape the future of territorial governance in ways that the others do not.

2.5.2.4.2 *Let a hundred flowers bloom...*

Hypothesis

In this scenario, the Regions have been strongly empowered by the Nation-states. Of course, the extent of regionalisation is still uneven throughout the European Union, but the bases for regional political action have been set up. A small number of Regions actively take the lead in the political rise of the Regions in European affairs, where they feel that they can make a difference. The European debate is enjoined by the Commission, the Member-States and the Regions, with a more even distribution of functions and responsibilities now existing between them. At the same time, in the light of the well-documented problems of governance and public policy provision the mixed results displayed by the traditional sectoral policy approach lead to bold territorial governance experiments in a number of test-regions. The short-term positive feedback gained here see this approach expand to include other regions over the longer term.

The story line

The process of regionalisation that began at the end of the 1970s, and was primarily aimed at the goal of creating more decentralised states, led to a redistribution of powers and responsibilities within each of the Member-States. Though the timetable was different in each country, depending on the institutional structure that was in place, most European States have, to some extent at least, adopted these 'decentralisation' ideas. One of the main achievements attributable to the States during this process was that they have managed, for the most part, to contain the demand for regionalisation within the boundaries of the traditional nation-states, preventing a regionalist implosion from taking place²⁶.

The evolution of Belgium from unitary to federal state in 1998 was the turning point for the process of regionalisation in the EU. Since then, the Regions increasingly realised that the opportunity existed for them to become significant political actors, both in the national and wider European contexts. They also realised that the EU commission would acclaim any initiative that followed the principle of subsidiarity, which became the basic principle of the EU, thus providing significant leverage in their favour.

In 2009, ratification of the second version of the European Constitution gave new dimension to the regionalisation process. Indeed, its reference to 'local and regional self-government' (Article 5.1) considerably increased the influence of the European Union in the regionalisation debate. Its supporters thus perceived regionalisation as the natural future development path for democratic European states. Moreover, publication in 2012 of the 'Fourth report on economic and social cohesion' emphasised the role of the Regions as the means to achieve better cohesion across the European territory.

In terms of devolution, the Spanish and British 'regions' became the spearheads of this development, providing an example to be followed by the regions in the other EU members.

²⁶ The only exceptions here to the sanctity of post 1945 European State borders, if we are to include events in Eastern and Southern Europe, being the exceptional cases of East Germany, Czechoslovakia, and Yugoslavia. The former being re-united with the Federal Republic of Germany after the Cold War, the second amicably agreeing to a 'velvet divorce' in the creation of two new states, and the latter being ripped apart by civil and ethnic hatred.

The debate that began at the beginning of the century regarding the role of the regions in the Spanish system ultimately led to acceptance of the principle of regional diversity in 2011. This decision signalled the wider belief that the regions were now seen to provide the most appropriate decision-making in terms both of public service provision and in relation to wider identity issues. In 2013, the Spanish regions were given the constitutional right to intervene in EU affairs when their direct interests were deemed to be at stake. The original semi-federal structure was transformed into a fully federal structure. It was however at this point that elements in the Spanish government became particularly concerned about the possibility of nation breaking up into its smaller constituent parts, thus insisting that the move towards the devolution of power to the regions should take place wholly within the agreed framework of the unity of the Spanish State. It was thus made clear that the development of autonomous and prosperous regions was not to take place at the expense of the State level. The Spanish experience served as an example throughout Europe giving fresh impetus to the devolution debate. It also enabled a rational separation to be made between the question of the empowerment of the Regions, much needed at that time, and continuing recognition and preservation of regional cultural and linguistic diversities, which, though important, is in itself far too emotional a foundation upon which to build sustainable institutions, though proper recognition of the basis of local identities remains in some cases necessary to adequately define the region itself.

Some British 'regions' maintained a keen interest in Spanish developments, though in fact, only Scotland and Wales reached a degree of autonomy that could be compared to that achieved in Spain. The main forces that led to this drive for autonomy were the recognition of their specificity and nationhood, and the prospect of economic growth driven by the oil sector in the case of Scotland. But in the British case, the State was unlikely to change from being a regionalised unitary state to a federal State as Spain did. Indeed, the regionalisation process that was mainly led by Scotland now seems to have reached its zenith: i.e. economic and political autonomy, and the recognition of the cultural diversity of the nations within Great Britain.

As regards the nature of regionalisation itself however, it seemed that the extent to which regionalisation had taken place was dependent more upon a simple time curve than on national political specificities themselves. As such, what we were experiencing here was something of a Europe-wide linear process of change towards greater decentralisation. The different stages of regionalisation that were analysed were not then seen to be separate processes but rather must be seen as merely different stages in the same process: political decentralisation. The dynamics of this development in regionalisation terms could be summarized as follows.

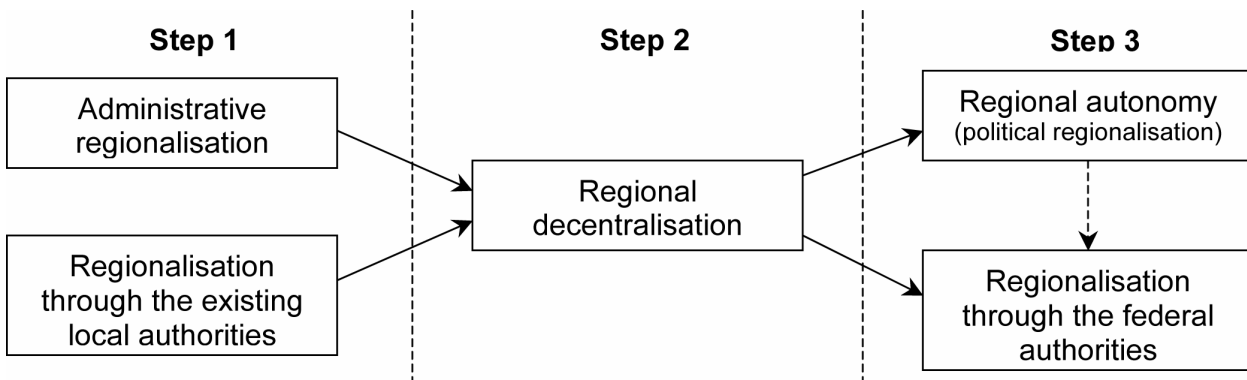


Figure 23 The Regionalisation Dynamic

The dynamics behind the evolution towards strong regional entities can be separated into three distinct steps. The first step dealt with the administrative nature of the regions. In some cases, the regions were created from existing entities, which did not have that purpose. In other cases, the regions were built from scratch by central government. The latter confirmed that administrative regions often did not correspond to cultural or functional regions: i.e. the Ruhr Region in Germany does not have a representative regional entity; while the administrative Brittany Region in France is smaller than the actual cultural and historical one. This first step was mainly a 'top-down' process. Administrative decentralisation was already a fact in most of the EU15 countries, but this step was also increasingly witnessed in the new Member States. This move towards the decentralisation of the State was partly fostered also by the need to comply with EU Regional Policy demands.

The second step in this process was that of regional decentralisation, where the central government granted more legitimacy and responsibility to the regions, though final accountability was still retained by the state. Elected regional assemblies led the regions, though these assemblies had almost no legislative powers. This step began as a 'top-down' process, but as the general public became more involved, the debate widened. Voters made their decision about the reapportioning of State level tasks (initially conceived by the State level as a *functional* rather than a *political* question) on the basis of the question over regional assemblies: public participation led to multi-speed regionalisation as the notion of elected regional assemblies was either refused or accepted in regions within the same country (Example of rejection: North-East England in November 2004). This example of the North-East of England illustrated rather well the problems inherent in a 'top-down' led process of political decentralisation, as it is not always that the citizens feel the need to create a new layer of bureaucracy or to dilute the power and the accountability of the centre.

The final step was mainly a 'bottom-up' process, as though the States were satisfied with the process thus far, but pressure for an even greater level of decentralisation and autonomy in some communities led to a deepening of the regional institutions in these cases. The main result of this stage of the process was that a significant level of political autonomy was given to the regions. To reach this step took some time, some countries had reached this stage as early as 2000, some by 2010, while for others it took rather longer. Nevertheless, the process was a general Europe-wide one, and it had now been firmly established. The time frame for progress on this issue was dependent on three main factors: the willingness of the central government to devolve a measure of power to the regional entities, the readiness of the regional institutions themselves to handle this greater level of responsibility, and the need for the general public to feel closer to the decision-making process.

The political decentralisation process was undoubtedly also facilitated by the Europeanization of Member States' policies, it being later acknowledged that EU regional policy had played an enormous role in convincing the EU States, but also their regions, that a 'Europe of regions' was the optimal development path to take. This fostered the development of regional civil society, due in the main to the new partnership and contract styles of public management. The role of the Region as a political arena for debate was also reinforced: regional political parties arose in place of the former decentralised national parties, while regional interest organisations also became more influential. As a result, public participation in policy-making is now much higher than before.

In parallel with the phenomenon of the empowerment of the regions, the approach to policy-making throughout Europe has fundamentally altered. Indeed, a more territorial approach increasingly replaced the former sectoral approach that was typical of both the EU

and most of the member-States. After the White Paper on European Governance was published in 2001, the debate on this issue increased in both volume and importance, involving the different layers of government in Europe: i.e. not only the EU and the member-states, but also the regions and municipalities were becoming increasingly interested in the development of a new approach to policy-making, based on the specificity of each territory. The demanding challenges the EU was confronted with at the dawn of the new century led to a more balance reallocation of duties among institutional actors, as well as other stakeholders. The informal ministerial meeting of November 2004, focusing on governance issues, proved in this sense to be the real beginning in terms of the new policy-making approach. The process of actually implementing territorial governance was of course to take a considerable amount of time however, as the different actors did not always agree on how to actually implement this strategy on the ground.

At the outset, the notion of territorial governance was not easy to define. In policy-making language, it became synonymous with the implementation of the strategic development of a specific territory by integrating the cross-sectoral approach and the notion of multi-level governance. This approach proved to be closer to the needs of the territories themselves, being optimal in terms of the use of available resources and as regards support for local/regional interests.

Sectors

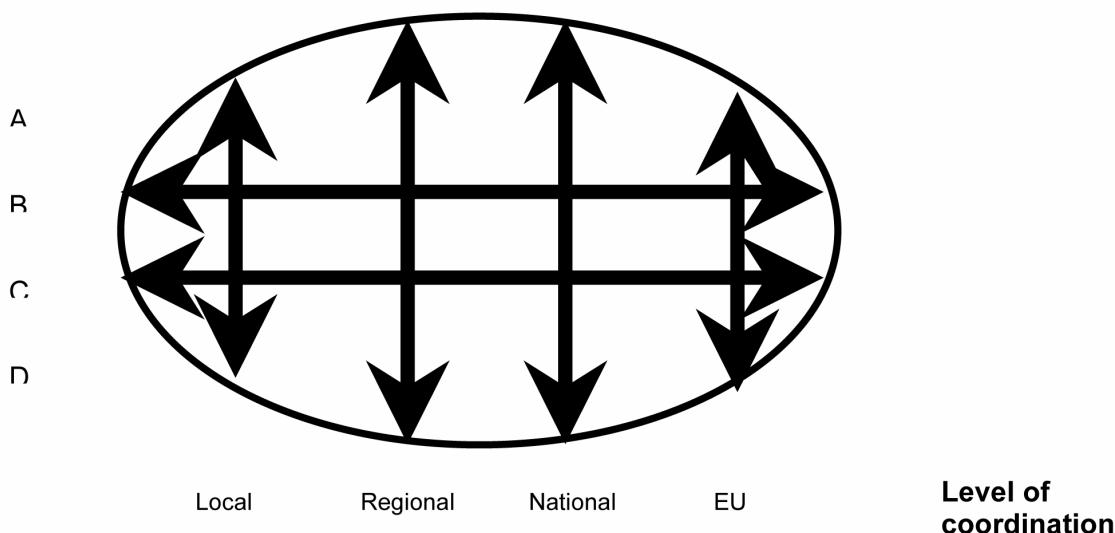


Figure 24 Integrated cross-sectoral and multi-level approaches - Territorial governance

Implementation of this new strategy was however not to be as easy as was initially believed. The first step was to convince the European Commission and the Member States that reform of the sectoral approach to policy-making was not only needed, but was vital for the territorial cohesion of Europe.

The multi-level governance approach, first initiated in some parts of the EU around 2000, thus became a guiding principle for policy-making though the 'sectoralisation' of policy remained. The different territorial entities (local, regional, national and EU) agreed initially to coordinate their actions and policies on a selected panel of sectoral policies, subsequently extending it across all sectoral policies. The clearer definition of each level's responsibilities engendered by these new arrangements provided a major fillip to the process more generally having results far beyond original expectations. By 2016, all of the former EU15 countries had reached this stage, while by 2021 the States that had joined in 2004 had also

done so.

The second wave of development dealt with a thematic approach rather than a sectoral one. It was evident to all that an integrated strategy was needed. Thus, the first step here was confirmed and implemented in the framework not of sectoral policies but of thematic strategies. For instance, the transport, energy, agriculture and environment sectors were grouped into a wider 'ecology' theme; Public health, education and training, civil protection and social affairs were grouped under a 'society' theme; Information society, industry, commerce and competition were grouped under an 'economy' theme. The sectoral regrouping process was difficult, and often subject to controversy, but ultimately it was seen as a further important step towards achieving a workable form of territorial governance. The success of this thematic approach was less immediately obvious, though the mixed results were due in the main to what we may term 'transitional issues.' Institutional actors were now informed by a broader perspective on the main issues, whilst also having access to an increased level of resources.

The final step in the institutionalisation of a territorial approach to policy-making was the integration of all of the above themes into a common territorial strategy, defined by the actors for each territory. The use of partnership arrangements developed rapidly in an attempt to build the most coherent and capable coalitions possible. Progress was swift here as non-governmental actors quickly agreed to participate proving to be useful contributors. The territorial approach to policy-making requires a certain degree of maturity from the institutions across the various levels, as it needs a clear definition of the responsibilities and accountabilities of each. In 2010, the German and Austrian regions became the first to implement this kind of territorial approach, mainly because they already adhered to most of the prerequisite conditions from an early point in the process.

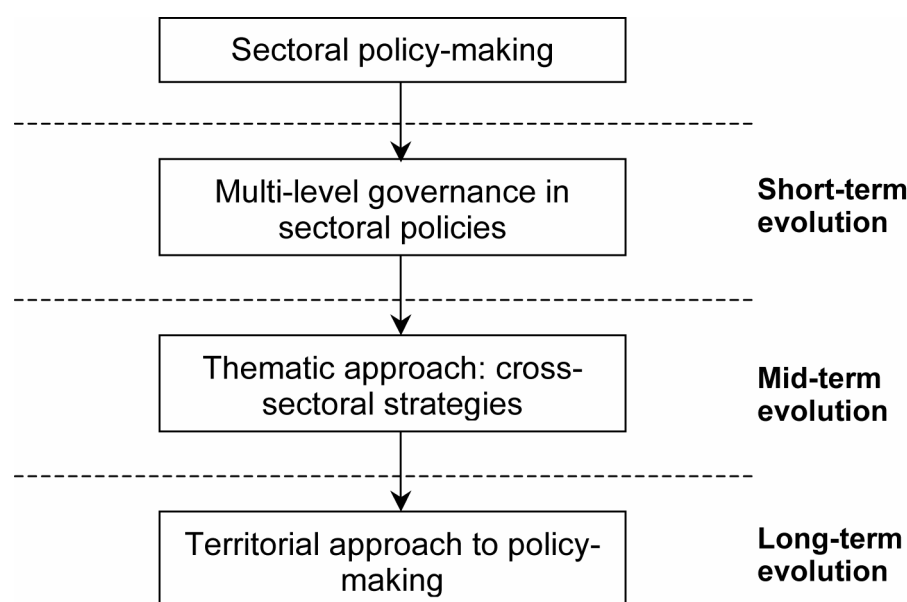


Figure 25 The dynamic towards territorial governance

The political factor was not alone in promoting the stronger role played by the regions, the emphasis put on the region as an integrated functional and economic area was also

decisive, pushing the Member States to acknowledge the relevance of the 'regional arena'. The development of Mega-regions as the motors of EU economic development was also a major factor in the overall economic development of the EU and its goal of greater global competitiveness. Moreover, the trans-national nature of these new functional regions gave the various regional political entities upon which they were constructed the means to act more autonomously towards central government. Acknowledging the need for greater polycentricity in Europe, the regions seized upon the opportunity to foster their economic development in their own way. The Öresund (Copenhagen-Malmö) Region was perceived as one of the most prominent examples in this respect as it became one of the leading economic areas of Europe, despite being outside the so-called Pentagon. The Vienna-Bratislava area also made tremendous progress. The notion that the Pentagon was the sole motor of European economic development thus became progressively out of date.

The stronger political role played by the Regions, as well as the territorial approach to policy-making, fostered trans-national regional co-operation throughout Europe. Having both the ability to draw up comprehensive regional plans and the means to implement them gave the Regions the opportunity to collaborate with other Regions, both within and across national borders. Indeed, in some areas, it quickly became obvious that the territorial approach would not be optimal unless it was drawn up on a cross-border basis. The best example of this was the development of co-operation between the French region of Nord-Pas-de-Calais and the Belgian region of Wallonia.

The results of these two parallel developments described above, the significant political and economic development of the Regions on the one hand, and the territorial and integrated approach to policy-making on the other, brought significant changes in the way public policy was made and the way in which civil society helps to shape it.

Spatial impacts of the scenario

At the macro level, polycentric development was fostered by the process of regionalisation, as the number of Mega-Regions and Global Economic Integration Zones increased, moderately in the Pentagon, but significantly in the more peripheral areas. The Mega-Regions are composed of a network of regional capitals. Europe has thus become more polycentric in its structure and more balanced as regards economic development. The networks of infrastructure between the Mega-Regions have been considerably improved, boosting the accessibility of regional capitals from a wider European perspective. However, regions that fall outside the Mega-Regions have fallen even further behind, thus increasing disparities.

At the *meso* level, trans-national co-operation between regions has also been fostered. In those co-operation areas, the Regions have developed a joint territorial approach to the development of the area. This was made possible by the new emphasis on territorial governance in most of the member-states. New infrastructure networks have been built inside these areas, making the regional capital cities less reliant on their national capitals for access to other markets. The development of strong physical networks does however raise questions over their impact on the environment, as well as over their potential side effects on the preservation of the natural and cultural landscape.

At the micro level, the settlement pattern initially concentrated around the regional capital. The main effect was thus urban sprawl around these cities and the extension of commuting distances. The regions can thus be seen to be developing in a monocentric fashion, with a strong regional capital, while rural areas are thus becoming increasingly seen as basically recreational, given the increasing need for leisure activities in the main regional cities. In the territorial governance approach developed by most Regions, the rural areas develop their comparative advantage by specialising in agriculture, tourism and leisure activities.

Final image of the territory

In this scenario, the final image of the European territory could be seen as reflecting the idea of 'the bunch of grapes.' The emphasis on territorial governance, coupled with a stronger political role for the regions, fostered a Europe made up of 'islands' of co-operation, i.e. the Mega-Regions. Boosted by the move towards a regionalised form of state, the regional capital cities are the main engines of European development. They have created a tight network of cities, and improved the exchange of flows, whether tangible or intangible. The gap between the central part of Europe, the so-called Pentagon, and the peripheral areas has therefore decreased significantly, but disparities are high between the 'successful' and the 'unsuccessful' regions.

2.5.2.4.3 *Divide and rule*

Hypotheses

In this scenario, most States put the process of political regionalisation on hold and devolve only administrative functions to the regions. The States maintain that their citizens remain strongly attached to their national identities. The introduction of the region as a political entity is perceived by both the states and the municipalities as a threat to their ability to fulfil their prerogatives. Moreover, they argue that the challenges facing Europe were too important to address and that this is not the right time to experiment with new types of policy-making. Emphasis is thus placed on upgrading the efficiency and coherence of existing European and national level policies. Sectoral policy-making thus remains the priority when dealing with territorial issues.

2.5.2.4.4 *The story line*

The ratification of the European Constitution in 2006 was a turning point in the debate against regionalisation. Indeed, the constitution reinstated the role of the Member States as the main level when dealing with European issues. In fact, the Constitution, and more precisely, Article 5.1, put the emphasis on the recognition by the Union of the domestic institutional structure of its Member States. This reinstatement of their 'legitimacy' gave those arguing against more regionalisation a solid legal basis for asking the EU not to interfere in matters of Regional Policy, as this could now be construed as a potential threat to 'the territorial integrity of the state'.

In 2005, regionalisation's supporters used the principle of subsidiarity as a central argument. The principle stated that decision-making responsibilities should be given to the level closest to the problem in order to improve efficiency and accountability. Thereafter however criticism was increasingly levelled against the regions because, in practice, the regional level remained too small to deal with global challenges, yet still too far removed from local concerns. As such, it fell between the two stools of the national/supra-national and the local/municipal levels, neither of which it ever looked like replacing. By 2020 then, the relevance of a regional political entity and its 'value-added' in terms of democratic processes was being seriously questioned, in both the practical political and the academic worlds.

The first two countries that decided to put a stop to the devolution process were the United Kingdom and Sweden. More precisely, the turning point was the rejection of the establishment of elected regional assemblies in North-East England in November 2004. The British authorities interpreted this result as a sign that the citizens were not ready to see responsibilities given to regional entities despite their concern for greater public participation and their disenchantment with the traditional political system. Moreover, it was

increasingly apparent that the citizens of the North-East of England were not prepared to pay to 'institutionalise' any sense of common regional identity that they may, or may not, have had. Basically, the citizens continued to accept the supremacy of the State as the proper level for policy-making. In 2011, despite pressure from Scotland, the British government declared that no new power would in future be devolved to the Scottish and Welsh parliaments. In fact, the main concern now was to deal with the separatist claims emanating from the Scottish Nationalist Party, which had for the first time, in 2010, formed the Governing majority in Edinburgh. Devolution was designed in the main to 'lance the boil' of nationalism in Scotland, this strategy had failed and the level of tension between Edinburgh and London rose daily as argument erupted over the both the *nature and content* of devolved powers and, more contentiously still, over the *right* by London to reassume them.

Sweden was the other country that most explicitly doubted the relevance of the need for stronger political regions. Indeed, in 2015, the central government decided to put an end to the regional experiments that were still ongoing in *Skåne* and *Västra Götaland*, rescinding the special status granted to these regions in 1999. Two main reasons, one domestic the other external motivated this decision. Indeed, a memorandum published in 2007 by a study group appointed by the parliament and made up of experts, stated that the new powers devolved to both regions had neither simplified the decision-making process nor made it more transparent. Consequently, the advantages of having an elected assembly rather than an appointed governor were not clear. The study also raised doubts about the overall efficiency of a political system constituted by three strong layers of power (State, Regions, Municipalities) in such a small country. It was then the usefulness of the region as a political actor, not as an arena for debate that was questioned. In consequence, the Swedish government decided that no further regional experiments would take place. The British decision, made in 2011, to halt devolution moreover reinforced the conviction in Swedish governmental circles that its own decision was the right one. The experiment was officially concluded in 2015, when the 6-year moratorium period put in place by the Swedish government in 2009 expired.

Most EU countries, with the exception of the federal states, re-considered the extent of their commitment to the regionalisation. Moreover, the fact that some countries such as Spain and Italy continued to be faced with strong regionalist claims, even after the process of decentralisation had convinced most States that the experiment simply endangered national integrity.

EU Regional Policy became directly targeted. As a consequence, EU programming periods put progressively less emphasis on Regional Policy. In the Programming Period for 2014-2020, the EU Commission, after much cajoling from the Member States, decided that Regional Policy would no longer be considered an a EU prerogative, and thus would now be a matter of domestic policy-making for each state. The following funding period, 2021-2027, stressed the need for the re-nationalisation of Regional Policy particularly as the funds available for allocation were becoming increasingly sparse, while the complete absence of Regional Policy funding from the latest EU Programming Period, from 2028, effectively removed the regional debate from the European agenda.

As regards the approach to policy-making, the continuing debate over the move 'from government to governance' reinforced concerns for greater transparency, accountability and efficiency. As noted previously, the region as an institution and as a political space was initially thought capable of solving many of these problems, though it was quickly realised in many circles that this was unlikely to be the case. The need was not then for something new, but rather simply for the structures of government that were already in place to be used more judiciously. Thus, the Member States decided that a better level of policy-making coordination and implementation between the State and the local authorities was what was really needed. In consequence, important sectors such as culture, social affairs, local

transportation, and the protection of the environment, were transferred to municipal responsibility. The Nordic countries led this move towards stronger local authorities, the most radical country being Norway, where in 2014, the regional authorities in place were simply dissolved. It was however felt that a new institutional structure, common to the EU countries but based on voluntary adhesion, was needed in order to better publicise the opportunities available for coordinated development at the local level. The countries that, in 2015, signed the agreement on Local Area of Co-operation (LAC) were the ones within which the municipalities already had a strong role, i.e. Norway, Sweden, Finland, Luxembourg, France, Belgium and Ireland. The aims of such entities were to enable the municipalities to better coordinate their resources, policies and actions by gathering together and focusing on particular issues, such as the environment, tourism, or the location of high-tech clusters. Most of the countries that ratified the LAC agreements already had such entities though they worked only on a national basis. The goal of the LACs then was to further develop opportunities for cross-border integration at the municipal level. The involvement of the municipalities was voluntary, which brought more flexibility to such co-operative ventures. In fact, the LACs improved the situation at the local level in a number of ways. Firstly, the municipalities concerned were able to better develop their local comparative advantage. In addition, the LACs were in line with the different EU Commission reports that stressed the need for greater economic competitiveness in Europe. Moreover, previously across many parts of Europe, major cities competed rather than cooperated with one another. The LACs however gave them the institutional capacity to work together, implementing the concept of 'co-opetition' created by the American academics Brandenburger and Nalebuff. Consequently, since 2020, most of the LACs have become coherent networks of small and medium sized cities, improving the overall economic performance of the area in question, as well as developing its polycentric structure. Secondly, the LACs enabled serious problems, such as those connected with the environmental, to be tackled, and have thus proved to be useful tools in the implementation of sectoral policies.

As useful as they seem, the LACs however failed to become fully coherent territorial projects because co-operation was mainly based on a sectoral approach. Individual municipalities often belonged to two or more LACs, with different sectoral aims, which segmented their ability to create a coherent territorial approach.

Another important policy choice was made in 2012, which aimed to strengthen the focus on the sectoral approach to policy-making. It was widely recognized that a territorial approach would be needed, as summarized in the proposals made during the informal ministerial meeting on governance in November 2004, but that the implementation of such a policy was considered to be unrealistic. The Member States were thus reinforced in their conviction that the sectoral type of policy-making was the most appropriate. Moreover, this traditional sectoral type of policy-making proved to be successful. In 2022, the TEN-T project provided the main argument in favour of this type of policy-making. Indeed, the new European transport pattern increased the accessibility of the most remote areas of the European Union and fostered better economic cohesion across the European territory. Other sectoral issues such as energy and the environment have also shown encouraging results. For instance, the share of clean energy production in terms of overall European production reached 40% in 2026, far beyond any previous forecasts or expectations.

The problem was thus not the nature of the policies themselves, but related in particular to the integration of sectoral policies across the different territorial levels (EU, national, local). The goal was to foster a multi-level governance approach in each sectoral policy, by integrating all of the governmental layers, as well as to achieve a better level of coherence between EU and national sectoral policies. In 2012, the EU Commission decided to extend the concept of the European Sectoral Agency (ESA) to all sectors, such that they all had the same internal structure and a more balanced level of participation. By having the same

internal structure, the ESAs were intended to be more comprehensible to the general public, as well as to the actors themselves. They were also designed to foster greater transparency and accountability with regard to sectoral policies.

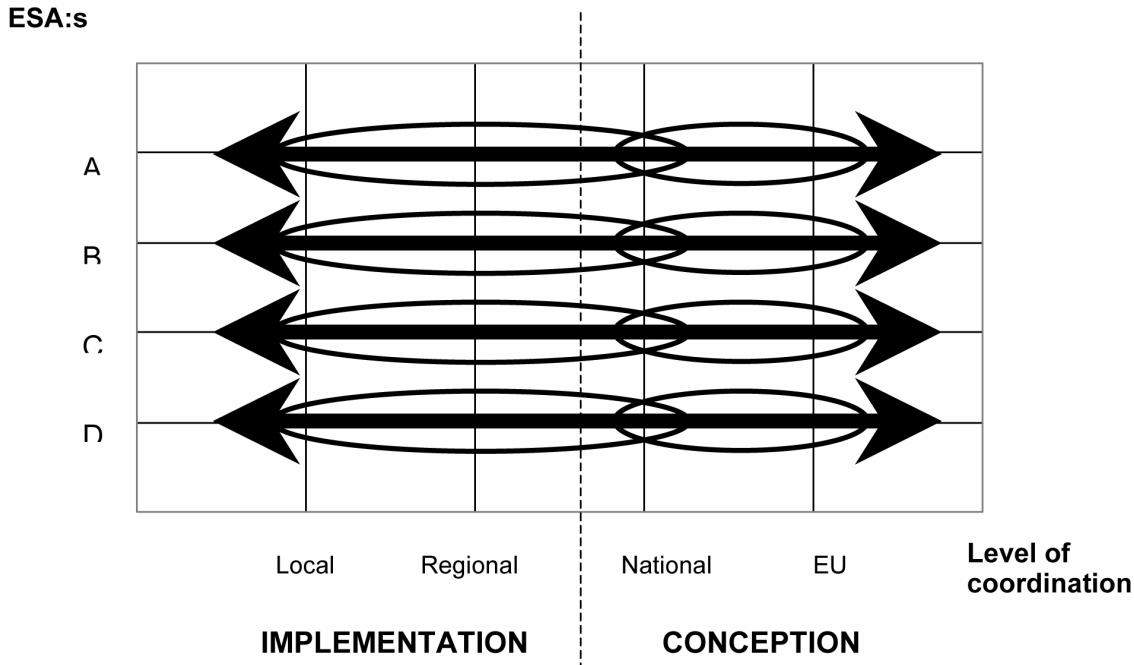


Figure 26 The division of responsibilities in the European Sectoral Agencies

As the figure above illustrates, the ESAs have played an important role in defining the responsibilities of all the actors involved. The guiding principle being, which level is the most appropriate for the conception (or implementation) of sectoral policies? The lead levels of government for the conception phase were the European Union and the Member States, as they have a broader view on the issues at stake. The regions, LACs and municipalities were granted responsibility for the implementation phase, as they are the closest to the potential policy effects. The ESAs put the national level at the centre of the process of decision-making, i.e. at the junction between the conception and the implementation phase, and having an extensive role in both.

In terms of the coherence of the sectoral policies, the next phase began in 2021, and was felt to be a natural development after the creation of the ESAs. Indeed, in 2020, the European Parliament decided to create the Agency for the Monitoring and Evaluation of European Sectoral Policies (AMEES), becoming a reality in the following year. The purpose of such an agency was to ensure that the various ESAs did not have a contradictory effect across the European territory. As such, the AMEES is expected to deliver a report on their activities every three years. The first task for AMEES was at the conception stage. Its goal was to ensure that the ESAs were defining globally coherent policies for the European territory, and avoiding contradictory impacts between the sectors. The second task was to be sure that the implementation of the sectoral policies was smooth and well coordinated.

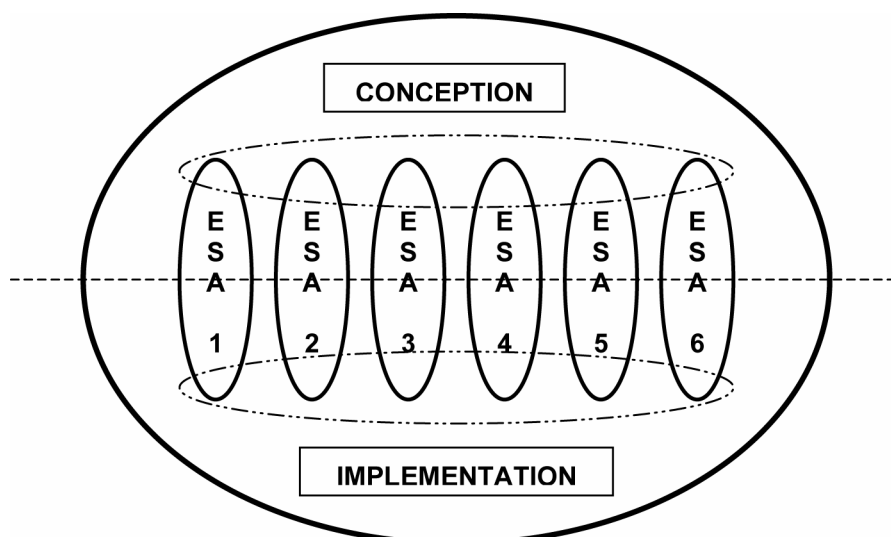


Figure 27 Method of assessment of the sectoral policies by AMEES

The institutionalisation of administrative-only regions and a sectoral approach to policy-making did not however see a retreat from the concerns and issues of territorial governance. In fact, it enabled creative solutions to be found that potentially made the decision-making process more efficient and more transparent to the various levels of government, as well as to the general public. In addition, it also facilitated the reallocation of responsibilities between the various levels of government (primarily the State and the municipalities) as regards territorial matters.

Spatial impacts of the scenario

At the macro level, the focus on a renewed State-municipalities relationship fostered the development of the capital cities, which continue to act as the main gateways for the rest of the country.

At the *meso* level, the capital regions remain at the core of the economic system as well as of the infrastructure networks. The transport network is star-shaped and centred on the capital region. The other larger national cities have good connections to the capital, but poor connections with each other. The urban system within countries is typically hierarchical. The regions along the national corridors are favoured. Regional divides are also getting wider at the *meso* level.

At the micro level, the creation of areas of co-operation between municipalities has fostered the development of networks of small and medium sized cities. In fact, it seems that the development of the main cities has to some extent been decoupled from the development of their hinterlands. Indeed, the LACs have provided an opportunity for rural areas to connect to other rural areas that were faced with similar challenges. In addition, this has enabled important steps to be taken in respect of the preservation of the cultural landscapes at the local level. The cross-border nature of the LACs has thus focussed increased effort on the resolution of sectoral issues such as the treatment of household waste and the creation of cross-border natural reserves. The intangible networks of knowledge are quite efficient, but the infrastructure remains as yet poorly developed, as the focus remains on the corridors between capital cities on the one hand, and between capital cities and the other main cities on the other.

Final image of the territory

The European territory is poorly integrated. Strong connections and exchanges exist between the capital cities, particularly in the European Pentagon, while at the local level co-operation between small and medium sized municipalities has had some success in tackling difficult sectoral issues. Nevertheless, in terms of these networks, an obvious lack of integration to the closest regional FUAs remains an issue to be tackled. Moreover, disparities between the development of the capital cities and the more peripheral areas are increasing, while the emphasis remains on significant infrastructural investment, threatening the environmental equilibrium of the regions crossed by the transport corridors.

2.5.2.5 Territorialisation

Rough elements (not yet language checked) / Part to be completed by June 2005)

ESPON Categories (From database navigator)

- ✓ 012 Spatial Classification
- ✓ 14 Social situation
 - 141 Poverty
 - 143 Standard of living
 - 144 Institutional structures
- ✓ 18 Public sectors
 - 181 Institutional structures
 - 182 Budgets
 - 183 Regional policy
- ✓ 192 Regional classification of Europe

The idea that lies behind the notion of territorialisation of the scenarios is about being able to spatialize the changes that occurred because of the evolutions of the driving forces in the scenarios. It would be interesting to compare the picture in 2005, beginning of our scenario period, to the one in 2030. One of the main aims of such territorialisation is to know if the same factors cause the same effects over the European territory. It is also about drawing a map of winners and losers, and consequently extracting some lessons from it. For instance, if we can measure the degree of empowerment of the region, we will certainly expect that its effects (economic, functional...) will be the same whether it occurs in Spain or in the United Kingdom.

It would be interesting to compare the evolution between empowerment of the region and the ESDP goals (polycentricity, cohesion...): are they linked with one another? Can we draw general conclusions?

Does the empowerment of the regions foster the implementation of the strategic European goals?

In this part, we will try to include some important themes that have already been treated in other ESPON projects like polycentrism or urban-rural relations. We will then try to use some of the indicators they have developed in order to spatialize the scenarios and their potential impacts.

For instance, it would be also interesting to see if a higher degree of regional autonomy implies a polycentric or monocentric regional structure of settlements, economic assets, decision-making centres... As regards polycentricity, it would be interesting to see the effects of regionalisation on the macro, meso and micro levels.

First of all, we could map the degree of regional autonomy in 2005 and in 2030. This map

would give a broad picture of the evolution on our vertical axis, that is to say the 'empowerment of the region'. The question is how to select the relevant indicator for doing so. Here are some proposals:

- Number of policy sectors under direct (or shared) responsibility of the regions
- Number of trans-national co-operation treaties signed by region

Second, we would focus on our second axis of evolution, between sectoral and territorial approach to policy-making. The difficulty with our theme is to find direct indicators that give clear information, as it is not directly dealing with tangible problematic.

2.5.2.6 Summary

In this summary chapter, our project team decided to use a table to clearly illustrate the structure of the two prospective policy scenarios developed previously in this paper. The table will give a broad picture of the hypotheses, the changes and dynamics as well as the main resulting issues that are at stake in these scenarios.

| | Let a hundred flowers bloom... | Divide an rule |
|-----------------------|---|--|
| Hypotheses | <ul style="list-style-type: none"> ✓ Empowerment of the regions ✓ Territorial approach to policy-making | <ul style="list-style-type: none"> ✓ Administrative regionalisation ✓ Sectoral approach to policy-making |
| Changes and Dynamics | <p>Three steps towards regionalisation: creation of administrative regions, regional decentralisation and regional autonomy and/or federalisation.</p> <p>Three steps towards territorial governance: multi-level governance, thematic approach with cross-sectoral strategies and finally territorial approach to policy-making.</p> | <p>Regionalisation process has been stopped in order to focus on more efficient state-municipality relations.</p> <p>Restructuring of coordination between EU and national sectoral policies, with the creation of European Sectoral Agencies (ESA:s).</p> |
| Main resulting issues | <ul style="list-style-type: none"> ✓ Strengthened political role of the regions ✓ Multi-speed regionalisation ✓ Territorial governance ✓ Development of Mega-regions | <ul style="list-style-type: none"> ✓ Strengthened role for the State and the municipalities in policy-making ✓ Re-nationalisation of Regional Policy ✓ Creation of Local Area of Co-operation (LAC) between European municipalities ✓ Creation of a Monitoring entity (AMEES) of sectoral policies |

Table 19 Scenarios summary table

2.6 Enlargement

2.6.1 Scenario base

2.6.1.1 Sources of Information

The bibliographical sources for this paper are eclectic and diverse, ranging from historical monographs on the nature of 'European identity' (Le Goff, 2005) to previous ESPON reports on the spatial impacts of enlargement. The general International Relations/Political Science literature on 'the EU and enlargement' is of course extensive, though concentration here has largely been confined to the major English language texts specifically on EU enlargement (i.e. Preston, 1997, and Nugent (ed) 2004), which have been used extensively in outlining the basis for the historical reconstruction of the enlargement *trends* and *driving forces*²⁷. As a source of additional 'up to the minute' material for content relating both to current events and the analysis and long-term policy goals, the EU documentation, policy information, and press coverage of the major policy-makers available on websites such as *EurActiv* and the Commission's own *EUROPA* site on 'enlargement' have also proved invaluable, as have the materials used in relation to the methodology of 'scenario building' and the previous attempts of those in the business of designing 'future scenarios' for Europe, such as for instance those connected with the *Four Futures for Europe* study.

2.6.1.2 The Current Situation and the context of EU 'enlargement' policy

2.6.1.2.1 *Towards the question of identity*

The purpose of this paper is to advance a number of prospective long-term scenarios for the future of EU enlargement in the period 2005-2030. This is a process that could potentially range in scope from being merely that of a 'tidying-up' exercise, wherein the final remaining 'geographical' European countries – primarily in the Balkans – are allowed to accede to the Union in basically the same fashion, and under the same rules as all previous enlargements, to one where the very nature, purpose and identity of what has hitherto been considered 'European' will fundamentally change, as Turkey, Russia, the Ukraine, the south-west Caucasus and the Maghreb are given, at the very least, an 'EEA-style' partnership role in a new Europe that no longer thinks in territorial terms about 'external relations' but instead conceives of such 'neighbourly' relationships primarily in functional economic terms. Thus essentially blurring the boundary between 'inside' and 'outside' and rendering meaningless the perennial questions over 'European' identity.

2.6.1.2.2 *The relationship between enlargement and integration in the EU*

Any attempt to discuss the *driving forces* behind the nature of, and prospects for, future enlargement is fraught with difficulty not only because of the specific historical issues at hand in each individual case, but also because of the very real problems encountered in

²⁷ Also useful in this context, though referred to only after the initial drafts of this paper had already been written, was former Dutch Prime Minister Wim Kok's influential report to the Commission on 'Enlarging the European Union – Achievements and Challenges' (2003).

setting out the parameters of such a discussion in the first instance. Moreover, a further layer of difficulty is added by the fact that basic definitional questions in respect of identity or ultimate purpose, such as: *what is Europe, or, what is the purpose of the EU and the European integration process more generally*, cannot be definitively answered²⁸. In addition it could be argued that, over time, the answers that have been given to such questions have often been designed simply to conform to the prevailing economic, political and ideological needs of the period in question. As such, the purpose of integration has variously been seen in the context of post-war Franco-German reconciliation, as a Cold War 'bulwark' against communism, and as a post Cold War stability pillar in an increasingly 'chaotic' world, in addition to conforming to the wider set of peace, security and prosperity goals commonly associated with the integration process.

Integration is then more a *process of becoming* than a *clearly definable political end state*, and thus it simply cannot be tied down to one specific historical outcome or narrowly defined set of institutional expressions. This is perhaps best illustrated by reference to the fact that the actual historical decision to adopt the particular institutional set that the EU now has reflected a fundamental ideological choice between the competing *federal* and the *intergovernmental* approaches to integration, each of which advocated a rather different 'roadmap' to European unity. Moreover, while a clear characterisation of the two is useful in reminding us of their explicit differences, the reality is of course that, in practice, they are often interlinked and thus far less immediately distinguishable than theory alone would have us believe.

The question of *enlargement* is then almost impossible to detach from that of the *integration process* more generally, and this is what makes it so difficult to postulate an 'end state' for either the final size of the EU's membership list or the ultimate range of its competences. Within the context of the continuing debate over 'deepening or widening'²⁹ however the dynamic of the struggle between the internal and external driving forces of the integration process was, historically, more often than not played out with the pace of integration almost directly correlating to the positive economic performance of the countries involved. As the EU increased in size however from a 'relatively exclusive' club of West European 'Atlantic' and 'Mediterranean' nations to encompass first Northern, then Central Europe, with the Balkans and perhaps also the space 'west of the Urals' still to come, the old dichotomy between *deepening* and *widening* is itself being increasingly problematised as the political costs of 'exclusion' for any particular territory increasing rise to outweigh the economic costs of their 'inclusion' on the EU as a whole. In effect, the very success of the

²⁸ This is perhaps the crux of this most contentious issue. Art 237 of the Rome Treaty – updated as Art. 49 TEU – states simply that 'any European state' may seek entry though of course the notion of what it means to be 'European' was not defined. Turkey 'tested the boundary' by gaining Association status in 1963 and again by subsequently applying for membership in 1987. This has remained a highly problematic issue for the EU, and one that was not ultimately to be resolved by the December 2004 EU Amsterdam Summit, where Turkey was given a target start date for the opening of accession negotiations (3rd October 2005), *but* was also told that the process was essentially 'reversible' and thus that it was contingent upon Turkey's own performance in respect of the general accession criteria. Note should also be made of Morocco's 1987 bid for entry which was rejected 'out of hand' because Morocco was *not European*, even though Morocco had also had an Association agreement since 1969. This situation in respect of future accession was however basically resolved in 1993 with the adoption of what later came to be known as the 'Copenhagen Criteria' for EU entry, which basically stated that prospective entrants must be liberal democracies in which the rule of law is respected; have functioning market economies that can cope with the competitive pressures of the market forces of the Union; be capable of implementing the *acquis communautaire*; and be willing and full participants in the EMU and CFSP. As such, entry was now, ostensibly at least, to be based on rational/functional rather than cultural/identity-based criteria.

²⁹ This theme will be constantly referred to throughout the paper. Basically speaking, it encapsulates the inherent tensions within the integration process from its existential 'purpose' to the practical realities of *le quotidien* of integration (i.e. the day-to-day realities). It is a question that is usefully posed, as it enables us to delimit the boundaries between continuing enlargement and the need for cohesion, but it is generally agreed that the EU would go to almost any length to avoid definitively answering it. See for instance Romano Prodi's Lubin speech (18/10/04) 'A shared destiny in the new Europe', where he notes, 'I have always felt it was pointless to get involved in the discussion between the Union's widening and deepening [...] the issue was not to choose but to convince.'

integration process has precipitated the emergence of questions over entry to the club that perhaps many hoped would never be asked.

In the next section then we will undertake a brief thematic overview of the enlargement process to date. This will be done within the context of providing baseline material for a 'scenario' approach (to be used in the second half of this paper), which uses 2005 as its base year and projects equal periods of 25 years back and forward from that point. This gives us a historical period encompassing the years 1980-2005, in addition to a futures period of 2005-2030. In the historical period we will undertake a brief overview of EU enlargement to date, beginning with the Mediterranean enlargements of the 1980s, continuing with the Northern enlargement of the 1990s, and concluding with a look at the most recent enlargement, which included much of post-communist Central Europe. For each *tranche* of enlargement we will briefly also note the impact of the new member(s) on the EU, both in respect of basic population, employment and GDP indicators, and with regard to each enlargement's impact on the driving forces of change in respect of both *widening* and *deepening*.

The purpose of this 'historical' section is – in line with the methodology of scenario construction – to pose a basic question relating to the issue in hand, the answer to which will help us to crystallise the basic *trends* that will, in turn, help to generate the basic *drivers* (outlined in section 3) that will subsequently be used to delimit the future scenarios. Section 4, will then attempt to show the likely results of the continuation of such trends into the future, by reference both to policy documents and expert analyses, while the second half of the paper will see the drawing up of a number of plausible 'scenarios' for EU enlargement, while also illustrating the potential territorial and regional impacts of significant further enlargement comprising both the Western and Eastern Balkans, Turkey and the Ukraine etc, and the problematic nature of distinguishing such a group of potentially privileged 'insiders' from those who, it is currently believed, will continue to be dealt with within the context of the EU's external relations machinery via the new 'neighbourhood/proximity' policy, such as Russia and the Maghreb and Mashreq countries of North Africa and the Middle East. In addition, consideration will also be given to the possible emergence of a much more narrowly configured multi-speed EU, where the inherent tensions between deepening and widening may even see some countries choose to leave the EU. The scenario base section of the paper concludes with a summary, questions for the ESPON 3.2 expert group and a bibliography of the sources used.

2.6.1.3 The historical experience of enlargement, 1980-2005: Identifying the trends and driving forces

2.6.1.3.1 The enlargement process in historical perspective: conceptual analysis

As noted previously, the 'deepening versus widening' dichotomy is lodged at the heart of the European integration process, and as such it has had a significant effect on the ongoing process of enlargement. It was however the end of the Cold War and the demise of the Soviet Union that brought these wider questions over the grand purpose of integration and, by extension, the ultimate location of the political, cultural and geographic boundaries of 'Europe' - of which the 'deepening versus widening' debate formed an intrinsic part – to centre stage. Moreover, the nature of the increasingly 'globalised' world that was to emerge during the 1990s, where the process of economic integration began to outrun the ability of nation states to politically 'control' or micro-manage such matters, made this issue all the more acute. Indeed, these tectonic events were to fundamentally change the strategic

environment for enlargement, challenging the comfortable notion that integration proceeded on the basis of a shared notion of core West European 'values'. As such it would be useful at this juncture to briefly sketch out the salient points in respect of the 'classical' method of enlargement, and use this as a convenient framework upon which to relay the historical record of enlargement and the driving forces for change in the period 1980-2005. This essentially historical *exegesis* will thus provide us with our long-term policy *trends* while also suggesting the nature of the *driving forces* behind them.

A cursory glance at the historical record in respect of EU enlargement may give the impression that such events occur as essentially random occurrences, dominated by the 'tyranny' of wider geo-political developments such as the personal views of De Gaulle, the demise of military dictatorship as a governance option in Southern Europe, or the end of the Cold War. This would however be to consider only one half of a much broader picture.

The actual process of enlargement is firmly rooted in the origins of the EC/EU and the particular historical choices made at its inception over the approach to integration by the original six members. Rather than settling for the minimalist approach - envisaged by the OEEC and subsequently adopted by EFTA - focusing solely on economic integration, the original members of the EEC opted for a maximalist approach that envisaged the overall goal of European integration to be *political integration*, which was to be achieved initially through a process of functional economic integration. Two salient points can be inferred from this analysis, which together form in shorthand the basis for all subsequent enlargement policy while also helping us to conceptually link the issues of *deepening* and *widening* so prevalent in the wider historical debate. For the purpose of brevity they can be stated as follows:

- (1) Progress towards further integration - i.e. *deepening* - has always depended on the existence of favourable economic circumstances.
- (2) Enlargement - i.e. *widening* - only proceeds when the risks of dilution have already been minimalised.

Taken together they form the basis for what we can term the *classical method* of enlargement³⁰. As such, the EU has always sought to maintain a fundamental linkage between *deepening* and *widening* by invariably seeking to link successive waves of enlargement to new integratory projects. This is a pattern that is generally supported by the historical record, where we can, for example, link the Mediterranean enlargement with the SEA, the EFTA enlargement with the Maastricht Treaty and the 2004 Enlargement with the Amsterdam and Nice Treaties and thus to the prospective new European Constitution.

In their dealings with prospective entrants the EC/EU has been very consistent in terms both of the negotiating strategies for each enlargement and the basic structure of accession negotiations. It is then possible to highlight six key 'implicit' principles that underpin the formal procedures of the classical enlargement method, and as such, define the limits of compromise, thus helping to shape mutual expectations during each accession process. These can be summarised as follows:

- (a) Applicants must accept the *acquis communautaire* in full. No permanent 'opt outs' are available.

This has been a core component of the 'Community method' since its inception, best illustrated perhaps by De Gaulle's rejection of the UK's application in 1963. In addition, it should be noted that the ongoing expansion of the *acquis*, such as for example into the CFSP area, significantly raised the threshold of membership for the 'neutral' countries of

³⁰ This section, dealing with the *classical method*, is taken from Preston (1997) pp18-22, and expanded with the help of Nugent (ed) (2004) pp56-69.

Sweden, Finland and Austria that applied for membership in the early 1990s. Though it undoubtedly reduces the risk that new accession negotiations will undermine the complex package deals that already exist between existing members.

(b) Accession negotiations focus exclusively on the practicalities of the applicants taking on the *acquis*.

Here the focus is on negotiating time-limited transition periods and setting target duties for the reciprocal reduction and removal of tariffs and quotas, legal harmonisation, and policy alignment. Perhaps the best available illustrative example here is that of the creation of the *Objective 6* regions (based on population density rather than GDP *per capita*) to satisfy the needs of the new Nordic members in the mid-1990s. It is perhaps however in this area that we have seen the biggest changes in respect of the 2004 enlargement (see below).

(c) The problems arising from the increased diversity of an enlarged community are addressed by creating new policy instruments to overlay existing ones, rather than by fundamental reform of the existing instruments' inadequacies.

Each new enlargement inevitably raises problems with the 'fit' between the prospective applicants' economic structure, the Community's own policy priorities, and existing problems with Community expectations and receipts. This is best illustrated by reference to the situations pertaining to both the UK and Spain after their accessions, both of which, for rather different reasons, had significant problems with the CAP as it was then constituted. In both cases, given the overriding need for new members to accept the *acquis* in full (see point 1 above) the UK and Spain, as new members, were forced to continue to bear the costs of the CAP, though of course once inside the Community they could attempt to work for its reform. Of more immediate interest however were the attempts to essentially 'buy off' those concerned with new instruments such as the ERDF (1975), which compensated the UK to some extent for the significant imbalance in its expenditure/receipts from the CAP, and the IMPs (1984), which were designed to compensate other Mediterranean-produce countries (particularly Greece) for Spanish entry.

(d) New members are integrated into the EU's institutional structure on the basis of limited incremental adaptation facilitated by the promise of a more fundamental review after accession.

With every enlargement the issue of institutional reform is raised in response to the view that increases in size make the original decision-making machinery ever more unwieldy. Nevertheless, explicit linkage between enlargement and institutional reform has always been avoided. As such we can see that the issue of institutional reform raised in the context of the 'EFTA enlargement' of the mid 1990s was deliberately held over until the 1996 IGC. The UK had initially challenged this approach because it felt disadvantaged by the new representative arithmetic that was to pertain after accession, where it felt that the proportionate increase in the number of votes needed to form a blocking minority in the Council would increase the bias towards the small states. Although a compromise was found the UK's core argument was however rejected, and the basic principle retained.

(e) The Community prefers to negotiate with groups of states that already have close relations with each other.

Such an approach allows the EU to obtain certain economies of scale in the negotiations process while also allowing existing members to defray the adjustment costs of enlargement more widely. The only occasion when this 'rule of thumb' was broken was over Greek accession in 1981, when the Greeks cited the pressing need for entry before being enveloped in the wider 'Southern Mediterranean' process that was to include Spain and Portugal, in order to bolster their new democracy and ensure that the anti-EU PASOK (Greek Socialist Party), if it were to be elected in the forthcoming elections, would be faced with the *fait accompli* of Greek entry. On a similar note, given that Portuguese accession was seen as largely unproblematic while Spanish accession was fraught with difficulty, the

Portuguese tried to de-couple themselves from Spain during the subsequent stage of the Iberian enlargement process. They were however completely unsuccessful in this attempt. Similarly, it was felt that, notwithstanding the Commission's initial views (1997) on the ability of the former East-bloc states to meet the requirements of the *acquis*, that as many as possible should be included in the latest 'big-bang' enlargement into Eastern Europe which thus became known as the 10+2 (rather than the 5+1) enlargement, with only Romania, Bulgaria (expected to be admitted in 2007), Albania, and the remnants (except Slovenia) of the former Yugoslavia missing out.

(f) Existing member states use the enlargement process to pursue their own interests and collectively to externalise internal problems.

As the decision to enlarge the EU requires unanimity this presents current member states with the opportunity to effectively 'hold to ransom' the whole negotiating process, as was the case for example with the Greek demand for 'compensation' by way of funds from the Integrated Mediterranean Programmes in return for removing its opposition to Iberian enlargement. Similarly, and perhaps even more contentiously, the story of the Common Fisheries Policy has from its inception been intimately intertwined with the machinations of horse-trading over enlargement. As early as 1970 an agreement was cobbled together on the basis of the fact that four new members with extensive fishing resources were soon to accede, with the new CFP becoming part of the *acquis* that they were now expected to implement, and though the price was to prove too high for Norway, the UK, Ireland and Denmark all reluctantly signed up. When Iberian enlargement loomed this then led to the conclusion of a 20-year CFP regime in 1983, which disadvantaged the Iberian candidates, while Spain and Portugal themselves subsequently demanded their early inclusion in the CFP regime as their 'price' for agreement to the 'EFTA enlargement' in 1995, where again the terms of the fisheries deal, among other things, proved unpalatable for Norway. In addition, Spain also received a significant increase in receipts from the Cohesion funds. Again, with the 2004 enlargement the rules over access to receipts from the CAP and the Cohesion funds were altered dramatically at the insistence of the current members, with Cohesion fund payments to the new members being capped and phased in, while CAP support for the new members will be gradually phased in up to 2013. Both of these decisions significantly impact on the new member states.

As such then we can see that historically the process of enlargement has a certain 'durability' with the same methods, rules and strategies generally being applied in each case (although this began to change significantly for the 2004 enlargement, of which more below)³¹ and while 'institutional reform' and the need for a more strategic approach are perennial demands during each new enlargement impulse, the basic 'rules of the game' established in 1957 certainly became entrenched thereafter, defining the EU's approach to prospective new members and the burdens that must be shouldered by candidates and members alike, at least until the 2004 enlargement.

³¹ Moreover, a major point of interest that was to emerge from the deliberations of the Amsterdam Summit of December 2004 was that the somewhat *ad hoc* set of arrangements used to framework negotiations with the 2004 entrants was now to be adopted as the 'official' doctrine. This new approach sees a number of significant changes to what we have termed the 'classical method', perhaps the most controversial of which (particularly in the context of prospective Turkish membership) is that under the terms of the new framework arrangements, 'the objective of negotiations is accession, but the outcome cannot be guaranteed beforehand'.

2.6.1.3.2 The enlargement process in historical perspective: temporal analysis

We will now briefly consider each enlargement in turn from a temporal perspective.

1981: Greek entry

The first Mediterranean enlargement saw the entry of Greece, a country of some ten million people, into the EC. The most important aspects of this particular enlargement were that the EC gained a non-contiguous member in the southern Balkans, far from the central core of Europe, and one that was at the time, surrounded by potentially hostile neighbours. In addition, the entry of Greece saw the beginning of a switch, in CAP terms, towards greater support for southern European produce. Thirdly, as Greece was the poorest member in both GDP and GDP *per capita* terms – and likely to remain so for a considerable period of time – this enlargement saw the beginnings of the move towards significant re-distributive policies in terms of the development of what were later to become known as the Cohesion funds.

1986: The Iberian enlargement

The second Mediterranean, or Iberian, enlargement brought into the Community roughly another fifty million people. It 'tidied up' the political business of the movement from dictatorship to democracy held over from the mid-1970s, but, as with Greek entry previously, it brought in two countries that were significantly poorer in both GDP and GDP *per capita* terms than the Community average, while also reinforcing the switch towards Mediterranean produce in the CAP and a further focus on the need to finance 'cohesion'. In addition, the entry of Spain in particular brought the issue of fishing, in the context of the CFP, to the boil, as Spain had, by far, the largest fishing fleet in the Community.³² In wider political terms, this enlargement was to precipitate the desire for a much deeper analysis of the Community's needs in the Mediterranean basin, which was to culminate in what was later to be dubbed, the 'Barcelona process', which now envisages the emergence of a free-trade area across most of the Mediterranean basin by 2010.

1990: German re-unification and the impact of the new German Länder

The re-unification of Germany in 1990 saw in effect a *de-facto* enlargement of the Community by another 17.5 million people. Politically, this 'enlargement' was perhaps more important in that it 'set the tone' for the EU's geopolitical response to the end of the Cold War and the demise of the Soviet Union. Germany in particular was adamant – even to the extent of pushing Mitterrand and Thatcher closer together at one point – that a further drive towards a new *ostpolitik* was necessary. Primary among the EU programmes designed to promote 'stability' in Eastern and Central Europe was the PHARE, while the setting up of the EBRD should also be mentioned in this context.

1995: The EFTA enlargement

Undoubtedly, once again, the end of the Cold War proved to be an important driver of this particular enlargement as the former 'EFTA-neutrals' were freed of the constraints – both physical and legal – of the previous period, and more able thus to 'finesse' the still difficult questions over their ability, technically as neutrals still, to assume the full responsibilities of the *acquis* in the area of *security* and increasingly now also, though more controversially, *defence*. With a significant caveat in respect of Finland however this point about the importance of the end of the Cold War should not be overstated, for the rather more prosaic issues of economics also played a significant role. As such, the negotiations over the creation of the EEA that sought to bring together both EU and EFTA countries under the same economic roof was simply overtaken by events, and thus in quick succession Austria,

³² It should also be noted here that 1985 saw Greenland actually choose to leave the EC after it was given a significant measure of autonomy by Denmark.

Sweden, Finland, Switzerland and Norway all applied for membership - a process from which Switzerland was subsequently to withdraw after the EEA referendum was narrowly voted down, and Norway was, again, to vote against in its second accession referendum. The three new members that did join however were, unlike the previous Mediterranean enlargement candidates, all above average in GDP and GDP *per capita* terms, while between them, they brought roughly another twenty two million people into the Union. The focus of this enlargement - perhaps the smoothest in EU history - was generally to be seen in three areas. In institutional terms the EFTA newcomers brought with them strong 'parliamentary' traditions and a focus on fiscal probity and public service (i.e. the instigation of the EU Ombudsman). In policy terms perhaps two 'issues' stand out, namely, the desire to improve environmental standards, and in foreign policy terms, a refocusing on North-Eastern Europe, and in particular on the need for what was termed, *the Northern Dimension*, which was basically an attempt to include Russia in a wide set of cooperative multilateral processes, whilst also preparing the way for Baltic accession to the EU.

2004: Enlargement to Central and Eastern Europe³³

The 2004 enlargement was significantly different from all previous enlargement rounds for a number of reasons. Not only was it different in scale, with, in effect, the potential doubling in size of the Union now at stake, but the applicants were in themselves unlike all who had gone before them. This is perhaps best illustrated with reference to GDP *per capita* figures which show that while Spain and Portugal, at the opening of their accession negotiations, were at around 70% of the EU average, in the CEEC's this figure was much closer to 40%, while, for the next batch of prospective entrants - Bulgaria and Romania - in 2007, it was less than 30%. In effect, though EU GDP as a whole rose by 5% after enlargement, GDP *per capita* across the Union actually declined by 18%. As such, it was clear from the outset that each applicant would face a number of serious difficulties and/or challenges in respect of both economic modernisation and the administrative capacity to actually implement the *acquis*, which, in itself was a body of law that now simply dwarfed in size that which, for instance, the UK in 1973, or even Greece in 1981 had had to digest.

It is for this reason then that the 'classical method' (outlined above), had to be significantly amended for this round of enlargement. Unlike previous rounds, which focused on the candidates' *willingness and ability to accept the acquis communautaire*, and where accession negotiations generally centred on *the extent and length of transition periods*, the 2004 enlargement saw the EU having to do much more to assist applicants to actually meet the conditions of EU membership. In particular, financial and technical assistance was given to prospective members in the form of PHARE, or through the EIB (European Investment Bank). In addition, by 1993, the Association or 'Europe' agreements initially seen in the context of providing an alternative to entry, were now explicitly viewed as pre-accession frameworks, while by 1998, as a part of the Commission's reinforced pre-accession strategy, *Regular Reports* on the progress of the applicants towards accession, and finally *Accession Partnerships* had been introduced to help provide a smooth transition towards membership. The 'flip' side of this extra pre-accession help was however that the entry requirements became in many respects rather tougher. Concerned over a whole host of issues such as employment and FDI 'diversion', the prospect of mass immigration from the east, the operation of the single market, the administrative capacity of the prospective members to enforce the *acquis*, and the potential for corruption, as well specific questions over continuing access to receipts from the Cohesion funds, the EU 15 thus sought to ensure that no applicant would enter the EU unless it met the exacting terms of entry. This

³³ This section is based on the account by Nugent (ed) (2004) pp34-55. In addition, an interesting contribution was made to the debate by Maniokas (2001) (unpublished paper) who argues that the 2004 enlargement was characterised by four salient points: *Increased Complexity* (more stages, more and improved controls to access): *Differentiation* (whole sets of conditions developed for each negotiating stage): *Conditionality* (conditions became more detailed and flexible throughout the process): *Asymmetry* (instruments based on contractual and more or less mutual negotiations were gradually replaced by instruments based on unilateral obligations).

strategy was twin-tracked, with the laying out of the 'Copenhagen Criteria' on the one hand providing the wider political dimension, and the findings of the Commission's document, *Agenda 2000: For A Stronger and Wider Union* (1997), providing the Economic basis for enlargement 'within the existing limit of 1.27% of GDP' on the other, which in effect saw very unfavourable settlements in respect of the CAP and the Cohesion funds for the prospective new members. Finally in terms of the 'knock-on' political effects of the enlargement, and notwithstanding the various outstanding issues in respect of institutional reform that it raised, perhaps the most interesting issue has been the desire of some new members, Poland in particular, (as with, for example Finland re: Estonia in the previous round) to 'champion' further enlargement to the east in the form of Ukrainian entry, something that would have been inconceivable barely ten years ago³⁴.

2.6.1.3.3 Identifying the 'trends'

As far as enlargement is concerned, perhaps because it is a discrete policy area with limited political inputs and outputs, identifying the *trends* from which we can then discern our *driving forces* is a fairly straightforward exercise. The long-term trend has seen the context of European integration develop in a certain fashion – basically within the parameters of the *federalism versus intergovernmentalism* dichotomy. This ongoing 'debate' at the core of Europe has thus had a profound effect on how the EC/EU has then set itself up to deal with those on the 'outside' – both in terms of those who have been identified as potential future members (i.e. the enlargement mechanism) and in terms of those whom it was believed would never qualify for membership (i.e. the external relations mechanism). Though of course the 'boundary' between the two mechanisms has never been watertight, as the case of Turkey may eventually prove. The major defining question that essentially structures debate over enlargement then is that over *widening* versus *deepening*, or, to put it differently, how to balance diversity and durability.

Initially, in the immediate aftermath of its inception, the EEC and its members sought stoutly, in response to those in the UK and Scandinavia who argued for a much looser and less 'politicised' approach, to defend their interpretation of how the institutions of European integration should be structured. Enlargement thus occurred at a very slow pace until integration's initial economic success began to outweigh the original sceptics' political reservations. Even at this point however significant controversy surrounded the actual admission of new members (the UK in particular), with some of the original members (France in particular) remaining sceptical of the applicants' conversion to the goal of political union over and above the desire to achieve economic integration and its attendant benefits³⁵.

By the 1980s, with at best grudging acceptance of the EU in the UK and Denmark a new phase of enlargement beckoned. With the major economies of Europe now all members, and the list of unreconstructed sceptics – who still placed political concerns over economic necessity - dwindling to its Nordic/neutralist hardcore, the EU embarked upon a new phase of enlargement to include the 'new democracies' of the Mediterranean, namely Greece, Spain and Portugal.

³⁴ Indeed this implicit strategy on the part of the Poles (and Lithuanians) played a significant role in bringing to a successful conclusion the Ukrainian Presidential Election crisis, as Poland's President Kwasniewski helped broker a compromise deal enabling the original flawed result to be overturned, with the 'western-leaning' Yushchenko finally being elected, much to the *chagrin* of Russian President Putin.

³⁵ Although one can of course argue that there were much more prosaic reasons for De Gaulle's desire to bar UK entry to the EEC in the 1960s, the gist of his public argument – that the UK was not 'European enough' and as such maintained too close a relationship with the USA and the Commonwealth – squares with the notion that De Gaulle was a defender of 'the Temple', which was in effect what he maintained as 'a certain idea of Europe'.

While economic factors of course played a role here new potential drivers also emerged as wider political factors played an important part in the decision to enlarge – reaffirming the Mediterranean countries' impulse towards democracy – while at the same time enabling the current members to ameliorate the long list of tensions currently animating them³⁶. To some extent then we can also postulate that – from the perspectives of both the current and prospective members – political considerations joined economic ones in terms of the desire for enlargement, while a certain amount of 'bureaucratic prompting' occurred in a number of fields in an attempt by the guardians of the European institutions themselves to combat the virulent strain of *euroclerosis* that emerged at the political level during this period.

By the 1990s, and in the context of the end of the Cold War and the fall of Communism, a further impulse towards enlargement saw the application of the remaining original sceptics and neutrals, with Austria, Finland and Sweden finally acceding in 1995, leaving only Norway and Switzerland outside. While the then Member States were more than willing to accept new 'wealthy' members – suggesting again perhaps the importance of the economic driver – this can be countered to some extent by the fact that the three new members were already in the EEA, and thus already party to the full force of EU legislation in this respect, as such it is necessary to once again look to other potential drivers. First and foremost here could perhaps be the desire on the part of the new members to avail themselves of the opportunity to help shape their own futures that full membership offered, moreover, with the former Communist countries of Central and Eastern Europe by now beginning to seek membership it was felt in Austria, Finland and Sweden that their own entry should now come as swiftly as possible in order for them to be able to 'negotiate from a position of strength' when the next round of enlargement discussions inevitably began³⁷.

The trend away from economic drivers continued with the 2004 enlargement. From the current members' point of view, enlargement to Central and Eastern Europe was thought to be unlikely to bring any immediate economic benefits, indeed it was likely instead to generate significant levels of additional cost in the medium term, while for the prospective new members themselves it was acknowledged that accession would bring transitional economic burdens, which would only be partially offset by EU transitional payments and access to Cohesion funding. In reality then this particular phase of enlargement was driven much more by wider political concerns similar to those that had played a part in the Mediterranean enlargements of the 1980s. Notwithstanding this laudable public stance of support for democracy – which was perhaps at its most poignant in respect of Polish and Czech entry – the broader political rationale here was that the EU should be in the business of 'exporting stability' if only in the final instance to avoid 'importing instability'. Similarly, in economic terms the changing nature of the global economy during the 1990s saw a subtle but important change in the nature of the European integration's regional economic role, with the EU now being viewed much less as the sole economic generator of integration and much more as its regionally based political guarantor.³⁸

³⁶ The period between Greek entry in 1981 and that of Spain and Portugal in 1986 was undoubtedly one of the most turbulent in the history of European integration. Notwithstanding the British budgetary issue, with Mrs Thatcher demanding 'we want our money back', which was only to be 'settled' in 1984 at the Fontainebleau summit, many other issues also caused concern, with perhaps the *nadir* being reached at the infamous Athens summit of 1983, which for the first time saw the participants were so riven by disagreement over the future of Europe that they could not agree upon the wording of the final communiqué.

³⁷ It could be argued that this was certainly a pertinent issue in Sweden and Finland in respect of both agriculture and Cohesion funding, particularly with regard to Interreg Objective 6, where 'getting ones feet under the table as quickly as possible' was perceived as being of major importance. Additionally, for Finland in particular, wider security concerns were also prevalent in the decision to apply for membership.

³⁸ This is perhaps best understood within the context of the changing nature of the overall economic goals of European integration and in particular the contrast between the Eurocentric *dirigisme* of Monnet and the 'globalism' of the Lisbon goals' competitiveness agenda.

2.6.1.3.4 **Discerning the historic 'driving forces' of enlargement**

As we can see then there are basically four main historical 'driving forces' defining this process. Although in their starkest form they are each necessarily rather stereotypical, and no one single explanation, of itself, is likely to be sufficient to capture the institutional or social complexity of any specific decision, taken together as a rough guide they do however adequately chart the range of motivations behind both the decision of individual states to seek entry, and the motivations behind the Member States' proclivity to endorse the entry of new members. The driving forces are as follows:

(a) Economic Success

It is undeniable that the EC/EU has been a resounding economic success. Whether or not this success can be attributed directly to the Customs Union and the Cohesion policies, or more generally to the simple fact of the 'stability' it has brought to Europe after WW2 is however not really the issue, as undoubtedly both played their part. Nevertheless, the economic success factor continues to act as a powerful magnet, ensuring that those on the periphery of the Union are eventually pulled into its orbit. Below the rarefied level of 'high politics' however it is undoubtedly the case that it was the reduction and elimination of tariff and non-tariff barriers to trade (i.e. the envisaged creation of a 'single market') that originally, in practice, drove the integration process. This of course had a significant number of 'knock-on' spatial effects within the context of enlargement.

The pace of this process is of course quickened when the attractiveness of the integration project – or the expected benefits of membership – precipitate indigenous 'push' dynamics from within the group of countries currently outside the Union. This was perhaps most evident with the Mediterranean enlargements of the 1980s, though the realities of the 'classical method' of enlargement generally ensured that current members' interests were protected at the expense of those of prospective entrants. As such, entry on the basis of short-term economic gain has rarely been an important driver of enlargement. Note should however also be made of the fact that the power of this particular driving force – in relation to some of the other driving forces – has declined in recent years for a number of reasons, with the nature of globalisation in particular playing an important role here. As such, where previously the focus of economic integration was 'regional' it is now increasingly global. This significantly impacts on European integration to the extent that the EU itself is no longer viewed as the primary *economic* generator of integration, but rather as its regionally based *political* guarantor. Thus the EU's role in this sense is subtly changing. Moreover, as the major economic 'players' in Europe are almost all now already members, the power of the economic driving force to continue to 'push the borders of the EU outwards' has waned with the decline in the number of economically attractive prospective applicants, while additionally, EU membership itself is no longer seen as a necessary prerequisite to participation in either regional or global economic integration³⁹.

(b) The fear of being 'left behind'

While the economic success driver historically acted as a powerful force 'pulling' the States of Europe into the Union, the fear of being left behind predominantly acts as a 'push' factor on prospective members. Basically, as the EU became increasingly successful,

³⁹ This point relates in particular to the fact that since the end of the Cold War, and with the ever-increasing march of globalisation, the accrual of the traditional economic benefits of 'free trade' to any non-member state has become somewhat detached from the need for actual EU membership *per se*. As such, non-members such as Norway and Switzerland have the EEA 'option' which gives them the economic benefits of membership without the political 'entanglements', while Turkey already has its own free-trade agreement with the EU – notwithstanding the fact that membership status was also being pursued. Moreover, this approach will be further expanded with the completion of the Mediterranean Free Trade Area in 2010, and has been adopted as the basis for EU interaction with the post-Soviet States. See the section on the Neighbourhood policy concept below.

encompassing ever larger swathes of Europe, the costs of non-membership increased exponentially for most countries, but particularly for those rather more fragile non-members who sought not only economic, but also political and *civic* benefits from entry. (Obviously, a much stronger case here can be made for the 'new democracies' of Central and Eastern Europe than, for instance, in respect of Switzerland or Norway). Moreover, this is, in itself, a rather dynamic process as the actions of ones immediate neighbours can potentially fundamentally affect ones own decision-making processes. We can therefore postulate that this factor perhaps played a role in respect of the various EFTA countries applications to the EU in the early 1990s, where each country undoubtedly sought to avoid being 'left behind' and where it was perceived to be important to get ones feet 'under the table' before the onrush of new applicants. Similarly, the Central and East European countries that were eventually to accede *en masse* in 2004 were each very keen to ensure that they were not 'slow tracked' – a fate that was eventually to befall Rumania and Bulgaria – with all the consequences that such a decision would have for their economies when they finally got down to the 'nitty-gritty' of the accession negotiations, with their neighbours and often direct competitors (in terms of industrial and agricultural production, the need to 'export' labour to gain remittances from the stronger economies of the Union, and in respect of attracting either FDI or 'cohesion' financing) now on 'the inside' and thus able, in part, to 'dictate' the conditions of entry for prospective new members⁴⁰. Thus the practical implementation of the 2004 enlargement framework saw the grouping together of a number of hitherto rather distinct groupings of applicants, namely, the Mediterranean island mini-states, the Baltic States, and the so-called Visegrad States, with Slovenia providing a fourth grouping as it managed to politically detach itself from the rest of the Western Balkan grouping – who were deemed unready for membership given the various continuing 'ethnic' conflicts across the region.

(c) Institutional/Bureaucratic 'Dynamics'

Although the EC/EU has never made it its policy to actively 'tout' for members, one could postulate that in the past a certain amount of institutional or bureaucratic 'drift' existed in respect of the issue of enlargement, particularly in terms of the wider implications of the intimate relationship between *deepening* and *widening*. As such, one could postulate that, on the one hand, perhaps in order simply to avoid 'bureaucratic sclerosis', and on the other, driven by the desire to maintain the holy shibboleths of integration theory, that the EU institutions themselves have at certain times sought to cajole the Member States towards opening up the Union to continual expansion. The institutions themselves then have thus acted as a subtle factor prompting evolution in this regard. We should of course stress that this has never been a major driving force in EU enlargement, but it is useful to consider this point nonetheless because it functions to remind us of the important role played initially by the Commission, and now also by the European Parliament, in the enlargement process, and in particular in respect of the accession procedures. In essence however this is a potential driver only in particular circumstances – such as when profound disagreement exists between the current members over the long-term goals of the Union as was the case between 1981-84 – and thus where the need for enlargement can be used to defray or redistribute the costs of such disagreements to prospective new members, or to reaffirm the status of the 'integration project' more generally.

⁴⁰ As was of course the case with Greece in respect of Spanish and Portuguese entry.

(d) Political stability/wider 'civic' duty⁴¹?

Finally, we can see that political factors have also been of fundamental importance in this ongoing enlargement process. Independent of the economic benefits of accession or enlargement (depending on whether one is a candidate or an existing member) there is certainly a strong case to be made for promoting the notion of the political stability⁴² that membership invariably brings – although in some cases this may be merely the displacement of a previous area of instability to a position beyond the 'new border' – as an increasingly significant driving force in the enlargement process. Not only does this however relate to the desire for what can now be termed 'soft security insurance' on the part of prospective members, but also to what we may term, the EU's 'wider civic duty' to admit all those that pass the 'entrance exam' essentially laid down by the 'Copenhagen Criteria'.

2.6.1.4 Future trends**2.6.1.4.1 Current EU enlargement policy and planned developments**

The historical overview undertaken in the previous section enabled us to generate specific *driving forces* from the *trends* discernable from that history. It is also clear that the resonance of each driving force has differed across time, with economic factors originally predominating only to be gradually complemented by political and 'psychological' ones, and while 'bureaucratic dynamics' explanations have played a role only during specific and limited periods, political 'stability' and 'civic duty' concerns would now appear to be of prime importance. With this framework pattern in mind we can chart existing policy projections into what would in effect become a 'baseline' scenario – i.e. that which is likely to occur if current trends persist.

The EU's enlargement policy is constantly evolving to meet the needs of current and prospective members. As such, even though the Union has just undertaken the largest and most challenging enlargement in its history the development paths and 'entry trajectories' for even more new members are already being laid out in detail. As noted previously, EU membership is now an 'imminent certainty'⁴³ for Bulgaria and Rumania after the Amsterdam Summit formally agreed their accession. This decision completes the process for the last of the twelve candidate countries that entered the pre-accession phase as far back as 1997. In addition, the summit launched the next phase of the enlargement process by agreeing to open negotiations with two more candidate countries, with accession negotiations beginning with Croatia in the Spring of 2005⁴⁴ and with Turkey in the Autumn of 2005. Moreover, EU

⁴¹ Without digressing at great length here, this civic duty element can be seen to lie at the heart of the 'core values' of the whole European Integration experiment, though such an approach only became practical after the end of the Cold War. Its theoretical roots undoubtedly lie in Kant's idea of 'perpetual peace' (Kant, 1795, 'Toward Perpetual Peace: A philosophical Sketch'), while the notion itself was again explicitly forwarded by Prodi in a speech given to the Catholic Lubin University on 18/10/04, where he noted that, 'when the European Council designated me as the President of the Commission in Berlin in March 1999, my main objective was clear, we had an historic 'duty' to unify the continent of Europe' (Prodi, Speech/04/463).

⁴² For example, just as Finland after its own entry immediately sought to promote the interests of the Baltic countries, Poland and Lithuania are now 'promoting' Ukrainian entry. This new 'stability' or 'civic duty' driver is thus perhaps now the most potent in the enlargement process, although one should not exclude economic motives.

⁴³ See the Enlargement Weekly section of the Commission's EUROPA website for 21/12/2004.

⁴⁴ A significant question mark was raised over the issue of Croatian accession on 16/3/2005, when for the first time, EU Foreign Ministers decided to postpone the commencement of accession talks with a prospective new member. The reason for this related to the EU's demand that Croatia fully comply with the Dayton Peace Accords and fully assist in the detention of General Ante Gotovina, who is wanted by the International Court in the Hague for war crimes committed during the 1991-95 war with Serbia. Gotovina is however seen as a hero in Croatia with a recent poll showing some 70% of Croats support him. Some EU Member States remain convinced that the Croatian government is not only failing in its promise to apprehend him, but is actively protecting him. Concerns have also arisen that this may now have a 'knock-on' effect on the commencement of Turkish accession talks due to begin on 3/10/2005. See, 'EU shelve Croatia Talks' *EurActiv.com* 16/3/2005. The EU did however adopt the 'negotiating framework' and it is generally felt that the decision was based on the EU's need

leaders also reaffirmed their commitment to work with Albania, Bosnia-Herzegovina, the former Yugoslav Republic of Macedonia, and Serbia and Montenegro to reinforce the membership prospects for all the countries of the Western Balkans⁴⁵.

The EU could of course also be joined relatively speedily by the remaining EFTA and EEA members, Switzerland, Norway and Iceland, should they choose to do so⁴⁶, while definitive decisions as to the potentialities of the Ukraine, Belarus, Moldova, Armenia and Azerbaijan have yet to be made, with, in addition, Russia, the Maghreb and the Mashreq countries providing a further grouping of states likely to be dealt with predominantly under the auspices of the new Neighbourhood Policy arrangements. It is to this issue that we will now briefly turn.

2.6.1.4.2 The new Neighbourhood Policy

The limits of enlargement: dealing with the EU's new 'neighbours'

As with any major policy decision we can search for the 'roots' or genesis of the idea. More often than not we discover that no one 'decision' was responsible – policy fields tend to have a life of their own, and a 'path dependence' that appears random and chaotic to all but the most knowledgeable observer. The EU's new Neighbourhood Policy at first sight seems to fall into this category. One can point to numerous decisions and strands of policy to highlight the fact that it is merely the continuation of past practice (i.e. one can seek to plot a direct lineage running from the original Association Agreements of the 1960s to the Europe Agreements and the 'Barcelona Process' arrangements of the 1990s and beyond), only in an updated form. As such, this is to suggest that the policy is evolutionary rather than revolutionary in nature. Moreover, much of the Commission's own rhetoric often seems to confirm this view, particularly when the Neighbourhood Policy is discussed in relation to the spatial impact of the current round of enlargement. This would however be to confuse the NP's *aims* with its *practical implementation*.

Two dates in particular stand out as being vital in shaping the current policy. The first was undoubtedly June 1993, when the Copenhagen European Council took the 'strategic decision' to open up the EU to the former Communist countries of Eastern and Central Europe, with as we have seen the conditions that they laid down for entry later becoming enshrined as the 'Copenhagen criteria'⁴⁷. The second important event in this context was the Cologne European Council of June 1999, for not only was the introduction of the *Euro* and the success of the *Agenda 2000* process triumphantly announced (points 5 and 39 of the Presidency Conclusions document) but tucked away in point 59 of the same document we find the following statement:

to be seen to be serious on the issue of 'conditionality'. As such, and with this caveat in mind, the rest of the paper will continue under the presumption that Croatian accession will still take place around 2007.

⁴⁵ The EU's Thessaloniki Summit of June 2003 set the integration of the Western Balkans as the next major goal for EU expansion, with a further meeting of interested parties (which included Germany and Austria) in Mamaia (Romania) concluding that, 'Serbia-Montenegro, Bosnia-Herzegovina, the former Yugoslav Republic of Macedonia, and Albania [will hopefully be] able to join the EU between 2010 and 2015,' depending on their fulfilment of the necessary criteria. (see, http://en.wikipedia.org/wiki/Enlargement_of_the_European_Union).

⁴⁶ While there has been little public change of attitudes to membership in Switzerland, a decline in Swiss prosperity, combined with the fact that membership was never 'ruled out completely' could see movement here, while in Norway, Prime Minister Bondevik recently intimated that a new debate on membership will be launched, after the next election, in 2007. In Iceland meanwhile the return to power of the centre-right Independence Party in the 2003 elections probably headed off any suggestion of this issue opening up again for a while – though significant movement in Norway could precipitate changes here too.

⁴⁷ We should also note here that the 'strategic' decision was taken to some extent with a view to lessening the impact of the American inspired 'hyper-liberal' economic reform process that swept across Eastern Europe immediately after the fall of Communism in the hope of creating an alternative 'European' model of capitalism in such countries, where the prospect of future accession was premised on such states' implementation of a whole set of far-reaching reforms in the political and social – as well as the economic – fields.

[The European Council] emphasises once again the conclusions reached by the European Council in Luxembourg that decisions on the opening of further [enlargement] negotiations can only be taken on the basis of the criteria established by the Copenhagen European Council. *At the same time it highlights the importance also attaching to the prospect of accession for applicant countries with which negotiations are not yet under way. For this reason it invites the Commission, in its next progress reports, to consider measures which can help crystallise that prospect for all applicant countries* (my italics). The European Council welcomes the constant progress in the candidate countries and encourages them to continue their reforms and adjustment efforts.

This again highlights the intimate linkage between deepening and widening by illustrating that the latter is impossible without the former, while on occasion the former needs the latter to 'kick-start' it. Taken together, the decisions reached in 1993 and 1999 suggest something that was altogether separate from the intentions of all previous 'association' or 'partnership' policies, and it was here then that it was decided that the EU would become 'continental' rather than 'exclusive' in scope.

The decision to undertake the 'historic' step of endorsing the broad continental strategy was taken then without reference to a clear definition of what 'Europe' was, (i.e. where its 'natural' borders, if such a thing indeed existed, lay) nor could it have been otherwise, for behind the decision lies the belief that the benefits of the integration model are 'universal truths' and thus beneficial to all. In practical terms however it was seen as vital that, after accession, a new dividing line or 'paper curtain' did not replace the old 'iron curtain' of the Cold War period. What has subsequently driven the practical development of the new Neighbourhood Policy then is the realisation that the bold rhetoric of this 'universalist' approach had ultimately to be balanced by the need to maintain institutional coherence and economic and social cohesion within, and political stability beyond, the current borders of the EU. We can hear this point vividly in Commissioner Verheugen's remarks to the Prime Ministerial Conference of the Vilnius and Visegrad Democracies in Bratislava (19/3/04) when he instilled a dose of realism in those who believed that the Neighbourhood Policy would provide a 'conveyor belt' of new candidates for accession, saying 'let me make it clear once more that our NP is distinct from enlargement. It neither prepares for enlargement, nor rules it out at some future point. For the time being the accession of these countries is not on our agenda'⁴⁸. It is in this context then that we turn to the actual development of the Neighbourhood Policy.

In a speech entitled 'A Wider Europe – A Proximity Policy as the key to Stability' (5/12/02)⁴⁹ Commission President Romano Prodi set out the basis for the new Neighbourhood Policy, stating that the 'EU's aim is to work in partnership to develop a zone of prosperity and a friendly neighbourhood – 'a ring of friends' – with whom the EU enjoys close, peaceful and cooperative relations.' The major assumption behind his vision of a Wider Europe was that, after enlargement, the EU must now become a truly 'global player' on the international stage. Enlargement had both internal (i.e. the need for coherence and cohesion) and external implications, particularly in respect of creating a more robust foreign and security policy structure and redefining the EU's relations with its new neighbours.

Prodi continued by then laying out the rationale for the new policy, grounded in the realistic practicalities of the current situation but infused with the idealism that had driven the integration project since its inception. He thus noted that the EU already 'projects stability' beyond its current borders and that we should therefore recognise that this creates 'legitimate expectations' among the EU's neighbours. Indeed, the mere prospect of

⁴⁸ See SPEECH/04/141. Gunter Verheugen – The European Neighbourhood Policy.

⁴⁹ This approach was subsequently to be firmed up in the Commission's communication of March 2003 on 'Wider Europe – Neighbourhood: A New Framework for Relations with our Eastern and Southern Neighbours, and endorsed at the Thessaloniki European Council Summit of June 2003.

accession, he argued, had been enough to drive the process of reform in Eastern Europe. As such he concluded, the EU looks certain to remain a 'pole of attraction' for its neighbours as historically, each new enlargement has brought new neighbours and ultimately, new candidates for membership.

The crux of the matter was however touched upon when he noted, in relation to the traditional model of enlargement alluded to above, that 'we cannot go on enlarging forever. We cannot water down the European political project and turn the European Union into just a free trade area on a continental scale. We need a debate in Europe to decide where the limits of Europe lie and prevent these limits being determined by others'⁵⁰.

The ultimate question of borders was however successfully finessed in the practicalities of the new arrangements as he noted that: 'We have to be prepared to offer more than partnership and less than membership, without precluding the latter.' This concept was summed up in the key phrase 'sharing everything with the Union but institutions.' The aim then was to 'export Europeanness' by extending to countries neighbouring the Union, from Morocco to Russia, a set of principles, values and standards that define the very essence of the European Union. Such a policy would not start with the promise of membership, but neither would it exclude eventual membership, thus neatly finessing the question of EU's ultimate size.

The spatial implications of the European Neighbourhood Policy⁵¹

Notwithstanding the questions over the policy's roots and strategic purpose, the mere fact of enlargement in 2004 threw up a number of significant spatial issues, the most obvious of which being that the EU's land border with the countries involved in the new Neighbourhood Policy increased from 1,300 Km to 5,100 Km, while the accession of Malta and Cyprus also brought a number of North African and Middle Eastern countries much closer to EU territory.

The practicalities in respect of how the ENP would be realised were further developed in a Commission policy paper entitled 'Paving the way for a New Neighbourhood Instrument.'⁵² Here the Commission outlined its view of how cross border and sub-regional cooperation should be promoted with the EU's new neighbours, with the New Neighbourhood Instrument defining the financial mechanisms underpinning such arrangements. The Commissioner for Regional Policy, Michel Barnier echoed this point on the centrality of cross border and sub-regional cooperation to the new Neighbourhood policy by noting that, 'promoting regional development in border areas, is a key element in boosting prosperity and stability on both sides of the Union's external border. In this context, the proposals in the communiqué offer the opportunity to build on the experience already developed under the INTERREG Community Initiative on the external borders of the Union and take it a significant step forward in co-ordinating our efforts on these borders'⁵³. Thus it quickly became clear that

⁵⁰ He continued this section of his speech by rehearsing the traditional 'Article 49 formula' on potential future accession candidates, but this all became rather tautological as he had just called for a full debate to discover where exactly the 'limits' of Europe actually were!

⁵¹ The list of countries covered by the newly titled ENP is as follows: Belarus, the Ukraine, Moldova, Georgia, Armenia, Azerbaijan, Morocco, Algeria, Tunisia, Libya, Egypt, Israel, Jordan, Lebanon, Syria, and the Palestinian Authority. In addition, Russia has a somewhat 'differentiated' position in terms of ENP. The St Petersburg Summit of May 2003 placed the Russia-EU relationship on a slightly different basis by seeking to develop a Strategic Partnership through the creation of four common spaces. The partnership will however draw upon elements of the ENP, which will also lead to increased opportunities for cross-border and regional cooperation. The Commission also recommends that Russia be offered support for implementing the relevant parts of the strategic partnership from the proposed European Neighbourhood and Partnership Instrument. Bulgaria, Romania, Turkey, and Croatia are either about to become members, or are about to begin the accession negotiating process, and are thus excluded from the ENP. Similarly, the remaining countries of the Western Balkans, namely, Serbia-Montenegro, Albania, Bosnia-Herzegovina, and the FYR of Macedonia are all viewed as having what is termed, 'a perspective of membership' and thus they are also now excluded from the ENP.

⁵² COM (2003) 393 final

⁵³ See, IP/03/922 - 'Wider Europe: Commission to strengthen cross-border cooperation with new neighbours.'

the New Neighbourhood programmes would be inspired by the experience of cross-border cooperation among the border regions of the then current and future (2004) members (i.e. the PHARE, Tacis, and INTERREG programmes)⁵⁴.

Focus would be put on four areas of cooperation:

- (1) Promoting sustainable economic and social development
- (2) Addressing common challenges such as the environment, health, and fighting organised crime
- (3) Ensuring efficient and secure borders, and
- (4) Promoting local 'people to people' actions.

Such programmes were to be designed and managed by local and/or regional authorities, and were to begin in 2004.

The Commission also noted that while considerable progress had already been made in respect of improving co-ordination between INTERREG and PHARE CBC and INTERREG and Tacis CBC, the problem remained the existence of different legal and budgetary frameworks for internal and external funding sources. In their view then the new Neighbourhood Instrument offered the opportunity to develop a single approach to cooperation across the external borders of the Union, which would address the problems then faced. Given that the current financial perspective was due to run until the end of 2006 however it was decided to adopt a two-phase approach in respect of implementation.

As such, during the 2004-06 period, programmes will be financed from existing financial instruments such as INTERREG III and Tacis, while from 2007 onwards the new Neighbourhood Instrument will provide funding for both sides of the EU's external border. As noted in the Commission's 'Wider Europe' document, the Neighbourhood programmes will include *inter alia* the following key features:

- (1) Programmes will enable funding to be allocated on both sides of the external border
- (2) The programmes priorities will take account of necessary objectives and activities on both sides of the border and the aims and objectives of the 'Wider Europe' *communiqué*.
- (3) The rules governing the programmes' management and committee structures will ensure a balanced membership for both sides of the border, and include appropriate Commission representation. A single application procedure and joint decision-making for the project selection covers both sides of the border.
- (4) The procedures that govern the operation of the existing instruments will be streamlined to meet the needs of the new NPs.

Beyond 2006 the new Neighbourhood Instrument will be applicable to all areas covered by the Union's existing cooperation programmes in the border areas. Such an instrument it is hoped will allow for a mix of cross border and regional cooperation activity to be developed around the external border of the enlarged EU, with the instrument combining both external policy objectives and economic and social cohesion goals.

In a further *communiqué*⁵⁵ the Commission outlined its practical Action Plans (i.e. the main operational instruments of the ENP), which will be based on the need for *joint ownership* (i.e. supposedly not an imposition of 'European values') but at the same time on a

⁵⁴ The MEDA programmes connected to the Euro-Med Partnership arrangement and the CARDS (Community Assistance for Reconstruction, Development and Stabilisation) programme for the Western Balkans, see [Council Regulation](#) (EC) No 2666/2000 of 5 December 2000, where also mentioned here.

⁵⁵ See, COM (2004) 373 final: 'European Neighbourhood Policy – Strategy Paper'

commitment to shared values, (i.e. respect for human and minority rights, the rule of law, good governance, the promotion of good neighbourly relations, acceptance of the principles of the market economy and sustainable development, as well as certain key foreign policy goals generally relating to 'soft security' issues such as drug and people trafficking, terrorism and migration). In addition, the pace of the development of these relationships will reflect the extent to which these common values are effectively shared. The limit between 'shared' and 'imposed' values is, thus, very fuzzy.

The Action Plans contain a number of priorities intended to strengthen commitment to these values, and cover a number of other key areas:

- (1) **Political dialogue**; covering key issues including the fight against terrorism and the proliferation of weapons of mass destruction as well as efforts to resolve regional conflict.
- (2) **Economic and social development policy**, offering neighbouring countries the prospect of a stake in the EU internal market based on legislative and regulatory approximation, as well as participation in a number of EU programmes (education, training, research and innovation) and improved interconnections and physical links with the EU (e.g. in the fields of energy, transport, the environment and the information society).
- (3) **Trade**: the ENP foresees a greater market opening in accordance with the principle of the WTO and a convergence with EU standards.
- (4) **Justice and Home Affairs**: close cooperation to include issues like border management, migration, the fight against terrorism, trafficking in human beings, drugs and arms, organised crime, money laundering and financial and economic crimes.

The Action Plans will however be *differentiated* i.e. 'tailor-made' to reflect the existing state of relations with each country, its needs and its capacities. This interim structure then will shape relations in this area until 2007, after which, if Action Plan priorities have been met, the next step could see them being replaced by new privileged partnerships in the form of European Neighbourhood Agreements.

As regards the issue of financing, assistance from existing sources, mainly *Tacis* and *MEDA*, will be complemented by the creation of a new financial instrument in 2007 (the European Neighbourhood Instrument), which will focus on cross-border cooperation along the external border of the enlarged EU. For the period 2004-06, the funding for ENP under external assistance programmes amounts to €255m, while approximately €700m will be provided for the corresponding EU internal borders under the INTERREG programme. For the 2007-13 fiscal period the Commission proposes a substantial increase in the annual amounts to be allocated to the ENI compared to the sums allocated for cross-border cooperation during the 2004-06 period.

In essence then the ENP is an attempt to manage relations with the countries on the EU's external border. While lip service is paid to issues such as cultural differentiation through the notion of joint ownership, and an institutional 'firewall' has been constructed between the ENP process and enlargement *per se*, the reality is that this can really only be seen as the EU's Plan 'A'. So much of the ENP is based on the same set of liberal values and assumptions – the projection of European 'values' – that came so spectacularly unstuck when the EU tried initially to intervene in the Balkans crisis in the early 1990s⁵⁶ while the means to achieve this policy goal – its 'spatial' driver – is provided by the INTERREG 'model' designed, culturally and institutionally if not politically, to prepare non-members for entry. The likelihood then is that the policy will be seen by some, such as Moldova and the Ukraine

⁵⁶ See, C.J Smith 'Conflict in the Balkans and the possibility of a European Union Common Foreign and Security Policy' *International Relations* Vol.XII(2) 1996 pp1-21.

for instance, as definitively leading to accession⁵⁷ and as such they will try to break free of its constraints as quickly as possible. While for others, predominantly in the Islamic world, the NEP is already viewed as both inadequate economically and controversial politically⁵⁸. Finally, in respect of the inherent problems facing the EU-Russia 'strategic partnership' the ENP is likely to have little more than a minimal effect particularly in respect of the 'energy security' issues that lie at the heart of the proposed partnership. The question is then, does the EU have a Plan 'B'?

2.6.1.4.3 The future implications of enlargement: Regional disparities and EU structural policies⁵⁹

The potential further enlargement of the EU to countries that currently show limited economic potential, such as Turkey, the states of the Western Balkans, and potentially also others such as Moldova and the Ukraine will have a significant effect on EU regional disparities. Moreover, this is an issue that will impact significantly on the future of the EU's structural policy regime. Although concern over future EU regional disparities will probably *not* be the determining influence on the political decisions taken over the future of EU enlargement, this remains nevertheless an issue of some concern. As such, these effects need to be further examined together with those pertaining to the recent (2004) enlargement and to the coming enlargement to Bulgaria and Romania (and, very probably, Croatia) in 2007.

We will focus here on three crucial issues: (a) the effect of population size and GDP level in respect to recent and future accession countries (b) the impact of the potential accession countries on the EU's 'eligibility for assistance' rules (c) the time needed for the GDP of the potential accession countries to 'catch up' with the EU-25 average.

Only two countries currently have official candidate status, namely, Turkey and Croatia (which will, if the 'Gotovina issue' [see footnote 44 above] is quickly dealt with, probably enter the Union in 2007). It is likely also that the Western Balkans' countries of Albania, Bosnia and Herzegovina, the Former Yugoslav Republic of Macedonia (FYROM), and Serbia - Montenegro⁶⁰, as well as the EEA/EFTA countries of Norway, Switzerland and Iceland will all apply for accession before 2030. For the purpose of this analysis then we will term all of these countries 'Potential Accession Countries' or PACs.

It is moreover possible that the Ukraine and indeed other parts of the former Soviet Union, as well as, potentially, some members of the Maghreb/Mashreq group of States, may also apply⁶¹. We will however limit ourselves here to a consideration of the potential effects of the accession of the countries we have labelled 'PACs.' Nevertheless, the line of argument

⁵⁷ See EurActiv.com. 'Yushchenko sees Ukraine in EU' (13/12/04), and 'Ukraine wants to upgrade new Neighbourhood Action Plan' (16/12/04).

⁵⁸ For a more pessimistic view on the likely impact of the ENP across North Africa see for example the interview with Prof. Chourou from the Univ. of Carthage in Tunisia, entitled, 'More Intensive Contacts – Throwing the South off Balance' in SEF (Stiftung Entwicklung und Frieden) News (No.17-June 2003) 'The Neighbourhood Policy of the Enlarged EU – Stability and Prosperity as Realistic Goals?'

⁵⁹ This section draws to a large extent on the Commission Staff Working Document on Issues arising From Turkey's Membership Perspective (2004) and particularly its sub-chapters on regional and structural policy as well as that on the EU budget. We have also taken into consideration the analysis of the EC Third Cohesion Report (TCR) (2004) on issues such as 'eligibility for assistance' and the 'catching up process'.

⁶⁰ There is increasing tension in the Serbia-Montenegro relationship, so much so that the Montenegrin government looks set to call a referendum on 'independence from Serbia' in February 2006. See, 'Montenegro seeks to part ways with Serbia' EurActiv.com 25/2/2005.

⁶¹ After recent political developments in both the Ukraine and Moldova the likelihood of this has increased further. For the States of the Arab world of North Africa and the Middle East however the outright rejection of Morocco's 'application' by the Commission in 1987, with all that such an unequivocal decision implied, remains a significant barrier.

that we seek to develop also covers the effects of the accession of the other potential candidates, as the main characteristic of these states is their poor economic status, which is similar to or worse than that of Turkey and the States of the Western Balkans.

Population size and GDP level of the recent and future accession states

It is obvious that the population weight in relation to the GDP level of the 2004 enlargement countries will have very important implications for national / regional disparities as well as for EU structural policies for some time into the future.

The 10 new Member States (see Table 1) have added much more to the EU's population (+20%) and to its surface area (+23%) than to its GDP (around 5% in terms of Euros). As a result, average GDP *per capita* in the EU25 is around 9% less than the average in the EU15. Bulgaria and Romania together add a further 6% to EU population as well as 9% to its size, but less than 1% to its GDP. The 10+2 new Member States then increase the area, population and GDP of the EU15 by 33%, 28% and 7% respectively.

For the purpose of this analysis, the population and GDP levels of accession candidate Turkey, as well as that of the two previously identified 'potential candidate' groups, i.e. the states of the Western Balkans and those of EEA/EFTA, (together termed the PACs here) would also have significant though rather differentiated implications in terms of their various impacts on national / regional disparities and on EU structural policies.

| | SURFACE AREA | POPULATION Millions – 2004* | TOTAL GDP – Billions EUR 2004* | TOTAL GDP – Billions PPS 2004*** | PER CAPITA GDP PPS 2004*** | AVERAGE PER CAPITA GDP PPS (EU25 = 100) 2004*** | AVERAGE PER CAPITA GDP PPS (EU15 = 100) 2004*** |
|---------------------------------------|------------------|-----------------------------|--------------------------------|----------------------------------|----------------------------|---|---|
| EU15 | 3.244.479 | 383,7 | 9731 | 9311 | 24267 | 108,8 | 100,0 |
| New members (2004) | 734.059 | 74,0 | 477 | 897 | 12117 | 54,3 | 49,9 |
| EU25 | 3.978.538 | 457,7 | 10208 | 10208 | 22303 | 100,0 | 91,9 |
| Bulgaria, Romania | 348.873 | 29,7 | 76 | 204 | 6860 | 30,8 | 28,3 |
| EU27 | 4.327.411 | 487,4 | 9783 | 10411 | 21361 | 95,8 | 88,0 |
| Turkey | 769.604 | 71,4 | 245 | 464 | 6500 | 29,1 | 26,8 |
| W. Balkans | 264.482 | 24,4 | 58 | 109 | 4487 | 20,1 | 18,5 |
| Norw., Switz., Icel. | 468.510 | 12,1 | 506 | 372 | 30657 | 137,5 | 126,3 |
| Potential Acc. Countries (PAC) | 1.502.596 | 107,9 | | 945 | 8760 | 39,3 | 36,1 |

Table 20 The impact of potential PAC accession as well as that of previous EU enlargements

* Eurostat latest forecasts for 2004 population - For the W. Balkans' states estimates taking into account Popul. 2002 (EC / DG Economic and Financial Affairs 2004) and recent population change rates.

** For 2002

*** Eurostat latest forecasts for 2004 GDP - For the W. Balkans' states estimates taking into account GDP in Euros 2002 (EC / DG Economic and Financial Affairs 2004), recent GDP change rates and ratio GDP Euros / GDP PPS for Turkey for 2004

W. Balkans: Albania, Bosnia & Herzegovina, Croatia, Former Yugoslav Republic of Macedonia (FYROM), Serbia – Montenegro.

As we can see, Turkish accession would have a far greater impact on the level of EU- wide disparities than the inclusion of either the Western Balkans or EEA/EFTA states as the share of Turkey's population as a percentage of the total population of the PAC is very high.

Moreover, we should also point out here that the *per capita* GDP in the Western Balkans countries is close to that of Turkey. The respective GDP in the 3 EEA/EFTA countries is much higher, but given that their total population is much smaller than that of Turkey plus the Western Balkans, the overall effect of the EEA/EFTA states' accession in respect of regional disparities across EU, would be marginal. Indeed, the scale of the statistical effect of PAC inclusion in terms of reduced average *per capita* GDP is comparable to the effect of the accession of the 10+2 new Member States⁶². The changes brought about by the 10+2 enlargement as well as those implied by the inclusion of the PAC states are illustrated in Table 20.

Commenting briefly on the contents of table 20, we can see that Turkey's population and size is comparable to that of the 10 new Member States considered together. Moreover, the total PAC population (105 million) is equal to that of the 10+2 new Member States. The PAC states would increase the EU27 area by some 35%, which is nearly equal to the percentage increase of the EU15 area in respect of the 10+2 enlargement. In addition, we can see that Turkey's GDP *per capita* in PPS terms is much lower than the average GDP of the 10 new Member States (at 28,5% of the EU25 average as compared to 52% for the 10+2 states). Obviously then Turkey has a much lower GDP *per capita* level than the 10+2 new Member States. If Turkey were in future to join the likely EU27 it would add 15% to EU27 population as well as 18% to its size, but only 2,2 % to its GDP. The average GDP *per capita* of the EU27 would fall by 9%. If all of the PAC states were to join a future EU27, they would add 22% to the EU27 population as well as 35% to its size, but only 7,7 % to its GDP.

The impacts of PAC accession on the EU's 'eligibility for assistance' rules

On the basis of the data outlined above and on current eligibility criteria, after accession, the entire territory of Turkey as well as that of the Western Balkans⁶³ would be eligible for assistance under Objective 1 of the Structural Funds in addition to assistance gained under the Cohesion Fund. The enlargement to EU25 brought about an increase in the number of people living in regions eligible for Objective 1 support (e.g. where GDP *per capita* is below 75% of the EU average) of some 51 million. In 2004, some 69 million people living in the 10 new Member States became eligible for Objective 1 support, while 18 million people, predominantly located in the EU15, became no longer eligible as a result of the lowering of the EU average income level. The entire territory of Bulgaria and Romania would also be eligible for assistance under Objective 1.

As the entire populations of Turkey and the West Balkan states would be covered by the Objective 1 criterion after accession, some regions in the post-2007 EU27 would lose their eligibility status because of the general lowering of the EU's average GDP level that would take place. It is very possible that on the basis of current income levels this effect would be similar to that of the enlargement to EU25+2, such that the net overall increase in population eligible for Objective 1 support would also be on a comparable scale. Moreover, in the regions that would lose their eligibility for structural assistance, the level of GDP *per capita* would remain the same after enlargement as it was before, just as the structural problems that underlie their relatively low levels of GDP *per capita*, prompting the need for structural assistance in the first place.

How long will it take the new member and accession countries to 'catch up'?

The time necessary for the GDP *per capita* level in the 10+2 countries to reach the EU15 average is very important for our evaluation of the future impact of enlargement on national

⁶² i.e. the countries of the (2004) enlargement *plus* Bulgaria and Romania, both of which will enter the EU on 2007.

⁶³ Including Croatia.

/ regional disparities across the EU. The duration of this catching-up process influences considerably the 'eligibility for assistance' of both the potential accession states and the 10+2 states, as well as the eligibility of the EU15 countries who currently benefit most from EU assistance (i.e. Greece, Portugal, Spain).

In the Third Cohesion Report / TCR (2004) the EU presented a very interesting illustration of this catching-up process using 'catch-up scenarios' based on simple assumptions about growth rates in the 10+2 states relative to the average rate in the EU15. Two scenarios were considered here. In the first, **growth is maintained in these countries at 1½% a year above the EU15 average**, the average being that which was achieved over a seven year period from 1995 to 2002, while in the second, **growth is sustained at 2½% above the EU15 average**. Both start from the latest forecast of GDP *per capita* in the different countries for 2004⁶⁴.

According to the *first scenario* (1,5 % a year above the EU15 average, i.e. 4% a year if growth is 2½% a year in the EU15), average GDP *per capita* in the 12 countries concerned would remain below 60% of the enlarged EU27 average until 2017 (Graphs 1 and 2). By 2017 it would exceed 75% of the EU average in only in four countries (see the TCR 2004). If growth were to continue at this rate, Slovakia would reach 75% of the average by 2019, while Bulgaria and Romania would still have a level of GDP *per capita* below 75% of the average in 2050.

According to the second scenario (2,5 % a year above the EU15 average, i.e. implying growth of just over 5% a year if growth in the EU15 is 2½%), convergence would, of course, happen within a shorter period of time. Nevertheless, the number of years involved remains considerable for many of the countries. For Poland, for example, even at this rate, it would still take twenty years or more for GDP *per capita* to reach 75% of the EU average, and many more years to converge to the EU average or close to it. For Bulgaria and Romania, it would take much longer than this. Nevertheless, at this rate of growth, the number of regions in the new member and accession countries that would require structural support because their GDP *per capita* remained below 75% of the EU average would obviously be reduced rather more swiftly than if growth were to be slower.

The TCR (2004) stresses that 'these scenarios should not be taken to imply that growth of 4% or 5% a year in these countries is the most that can be expected. First, the experience of Ireland over the past decade shows what can be achieved in terms of rapid growth. Secondly, growth potential in the new Member States will be greatly enhanced by improvements in the capital stock as a result of EU cohesion policy.' The TCR (2004) also stresses that, 'even if rates of growth well above the average in the EU15 can be sustained in the long-term, these scenarios demonstrate that for most of the countries, catching-up to the EU average is likely to be a long-term process.'

We should also point out here that the implementation of the current approach to the structural/cohesion policy regime could lead in future to 'catching-up' rates in the 10+2 new countries fluctuating between those of the first simulation and those of the second. Taking into account the fact that GDP *per capita* in Turkey as well as in the Western Balkans is much lower than that of the EU15, EU25 or EU27, the duration of the corresponding 'catching-up' process (to 75% or 100% of the EU15 GDP average), in terms either of the first or the second scenario, will exceed considerably that of the 10+2 states.

⁶⁴ Under the condition that the necessary regional data is available for the PAC countries, the MASST model could be used for this exercise once it is operational.

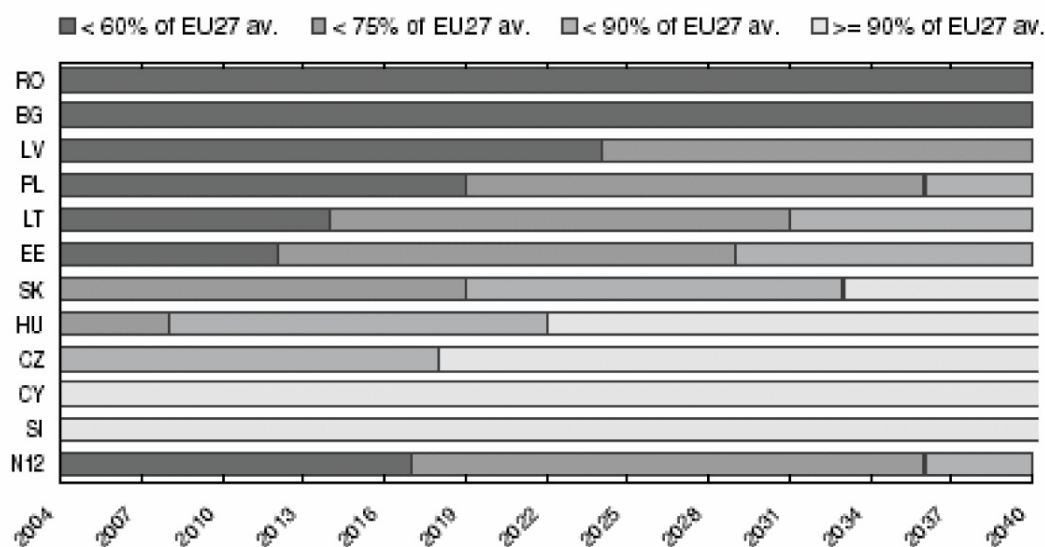


Figure 28 Simulation of GDP *per capita* (PPS) in the accession countries, 2004-2040 (relative growth assumption 1,5% per year above EU15 average)

Source of data: DG REGIO calculations based on Eurostat, National accounts

N12 = new Member States plus BG and RO; MT: no data

Source: TCR 2004

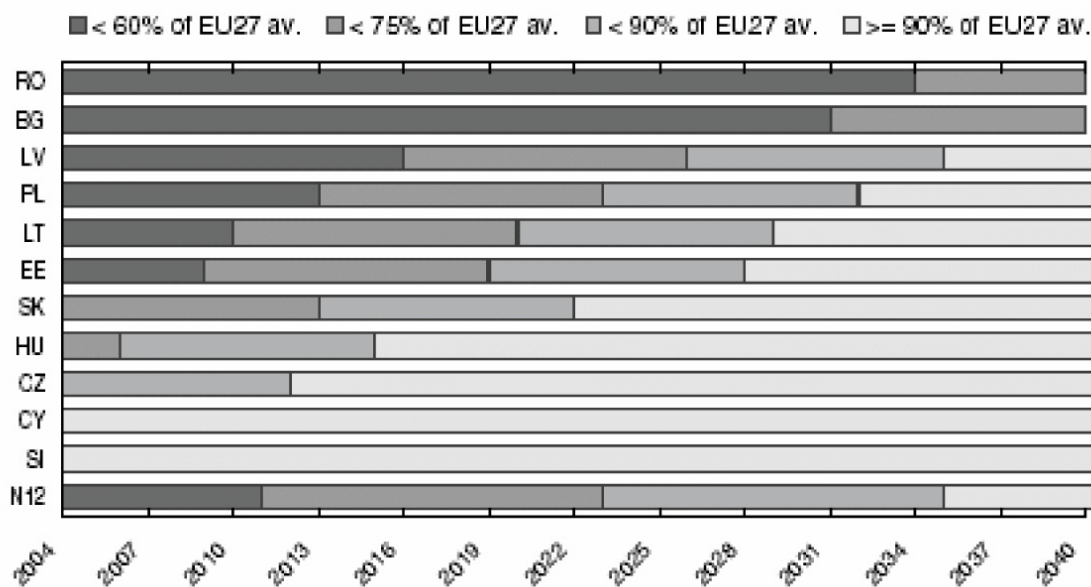


Figure 29 Simulation of GDP *per head* (PPS) in the accession countries, 2004-2040 (relative growth assumption 2.5% pa above EU15 average)

Source of data: DG REGIO calculations based on Eurostat, National accounts

Source: TCR 2004

2.6.1.5 Summary

To conclude then, the main trends in respect of EU enlargement are as follows; enlargement has historically occurred in an increasingly regular set of 'impulses', the pace of which we can see has perceptibly quickened since the end of the Cold War. Initially, two camps existed supporting different views of the nature and purpose of integration, though due in the main to the economic success of the EEC experiment the grouping with the wider 'political' view of integration prevailed. Once this point was reached the economic necessity of membership became the predominant driving force for a number of countries, however enlargement could only take place if two basic factors were in place, namely, where favourable economic circumstances existed, and when plans had already been put in place for further integration in new fields. The reason for this relates, in part, to the equivocal nature of the compromise agreement between the two sides of the integration argument and in particular to the desire by the EEC's original members to avoid 'dilution' as the organisation increased in size. As such, deepening and widening have been umbilically linked from the outset. Between 1973 and 1995 enlargements were handled in roughly the same manner – i.e. what Preston has termed the 'classical method' – where, basically, the onus was on the prospective entrant to align itself to the *acquis* and bear the short-term fiscal burdens of entry in the expectation of long-term political and economic gains.

This pattern was however fundamentally altered in the 2004 enlargement where significant levels of pre-accession assistance – both fiscal and politico-administrative – were required by all the new entrants, and with the EU set to expand still further with concrete plans for four new members already being developed, the existence of three EFTA/EEA members that could, under the right circumstances apply at any time, and as many as twenty more countries, seeking either full membership or, at the very least, a partnership agreement in the context of the new Neighbourhood Policy, questions over European identity, the 'boundaries' of Europe and the ultimate size of the EU look set to continue.

The drivers of enlargement have however evolved over time, with the end of the Cold War and increasing globalisation being the major exogenous variables for change here. Although we identified four discrete drivers, namely; *economic success*, *the fear of being 'left behind'*, *institutional/bureaucratic 'dynamics'* and *political stability/wider civic duty*, they are not equally potent across time. Thus if we were to consider this question in terms of defining an 'exit trajectory' from the period 1980-2005 we would see that the most important driver, for current members at least, was currently that of political stability, though the personal dynamism of Romano Prodi and his desire to see through the process of enlargement saw the bureaucratic and institutional dynamics factor also rise in importance, while for prospective members the fear of being 'left behind' probably continues to outweigh considerations of short-term economic gain. With no significant change in this pattern – i.e. no unforeseen cataclysmic event that will fundamentally change political expectations in either the Member States or in the prospective members - it is likely then that, at the very least, three more enlargements will occur before 2030 (Bulgaria and Romania in 2007, Croatia sometime thereafter and eventually also Turkey and the countries of the Western Balkans).

2.6.1.6 Questions for the 'expert panel' (feedback needed from the ESPON 3.2 group)

- (i) By simply projecting 'current trends' into the future it seems clear that the EU will continue to widen to 'export political stability' in order to avoid 'importing political instability', can this major strategic policy goal be achieved without significant further widening? - i.e. what are the political costs of non-enlargement?

- (ii) Do you agree with my analysis in respect of the displacement of economic success with that of political stability as the main driver? And what impact has globalisation had in this process?
- (iii) What are the economic costs of non-membership for a country like Moldova?
- (iv) The new Neighbourhood Policy has a number of specific 'spatial' impacts in particular relating to the new financial 'European Neighbourhood Instrument' (ENI), which will replace the *MEDA* and *Tacis* programmes. Is the new (i.e. post 2007) funding regime likely to have a significant effect on the delivery of assistance to the targeted countries, and will it enable the development of better cross-border co-operation initiatives?
- (v) What would the political implications for the wider 'stability strategy' be of a decision to effectively terminate the accession prospects for all, perhaps for 'a generation' let us say, after Bulgaria and Romania accede in 2007?

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2.6.1.8 Annexes

Annex 1

Some methodological aspects of the evaluation of the effects of 'PAC' accession on regional disparities and EU structural policies.

As the report on Turkey's potential accession points out, the implications of 'PAC' accession for the EU's structural policies are likely to be substantial, given the size and the economic features of the states concerned. It is however extremely difficult at this stage to effectively evaluate these implications, as economic developments in the interim are uncertain, while quantitative assessments remain highly speculative. We have essentially therefore been limited to undertaking a description of the challenges both to the EU and to PAC in the context of accession.

The analysis of the effects of PAC accession on cohesion policy is based on the following assumptions: (a) the tentative calculations of disparities given below are based on the current GDP levels of the EU27 and the PAC. By the time however that each member of the PAC grouping enters the Union, the levels of disparities could well be significantly different, depending on relative economic performance in the intervening period; (b) the *acquis* remains unchanged, even though a major reform of cohesion policy has been proposed by the Commission and may be implemented by the end of 2006.

While these static assumptions represent methodological limitations, it should be borne in mind that the low-income levels and wide regional disparities in both Turkey and parts of the Western Balkans are such that the analysis is not likely to be fundamentally modified by different growth scenarios and/or amended eligibility criteria. It should also be recalled that, under the current *acquis*, the level of transfers from the structural funds is limited to a maximum of 4% of a beneficiary's GDP.

Annex 2

| | Population | GDP per capita (1) | GDP Total |
|--------------------------------------|------------|-----------------------------|-----------------|
| | millions | EUR | Billions EUR |
| | 2002 | 2002 | 2002 |
| Albania | 3,4 | 1602 | 5,4 |
| Bosnia and Herzegovina | 4,3 | 1383 | 5,9 |
| Croatia | 4,4 | 5420 | 23,8 |
| Former Yugoslav Rep. of Macedonia | 2 | 1972 | 3,9 |
| Serbia and Montenegro | 8,1 | 2055 | 16,6 |
| Kosovo | 1,8 | 710 | 1,3 |
| Western Balkans | 24,0 | 2380 | 57,1 |

Table 21 Population and GDP in the Western Balkans (2002)

(1) Nominal GDP at current exchange rates. Data for Kosovo is a preliminary estimate, which may be subject to significant corrections. Kosovo remains part of the territory of Serbia.

Source: EC / DG for Economic and Financial Affairs 2004

Sources of data: National authorities, IMF and European Commission

2.6.2 Scenarios

2.6.2.1 Introduction: Creating the scenario field

The historical analysis undertaken in the scenario base section, further enhanced by an investigation of current policy trends in respect of, for example, the ENP and the future implications of enlargement on regional disparities and EU structural policies, enabled us to construct plausible driving forces for enlargement from the trends illuminated. In this context the dichotomy between *deepening* and *widening* was chosen as the most fruitful framework upon which to base the scenario creation process, as it neatly encapsulates the defining limits of policy choices in this particular field, whilst also providing a concrete link to the nature of the integration process more generally.

Our historical analysis suggests that the integration process itself is propelled by the twin 'impulses' of deepening and widening – i.e. attempts to deepen for mutual benefit, and where appropriate, the level of integration across a whole range of sectors and issues, while at the same time, attempting to extend the Kantian zone of 'perpetual peace' ('political stability') to an ever wider group of states. As such, the tension between deepening and widening is always present, for it is obvious that the relationship between the two needs to be carefully managed, as a too precipitous enlargement would have a detrimental effect on the EU's institutional coherence and socio-economic cohesion, while strictly defining the EU's borders in an arbitrary cultural sense, in an attempt to close down the possibility of further future enlargement, would precipitate the re-emergence of the very 'dividing lines' – with all the implications that this would have for 'stability' across the region – that the EU is currently trying so desperately to avoid.

It is for this reason then that while the deepening versus widening dichotomy is useful as an illustrative device, the point, as Prodi notes, 'is *not* to choose.' As such, EU policy in this sense continues to be a 'high-wire' balancing act that attempts to avoid the pitfalls of doing anything other than walking in a straight line¹. It is, moreover, for this reason that the 'Future Trends' section in the scenario base is 'bullish' with regard to future enlargement, as simply extending the current policy envelope into the foreseeable future – thus effectively giving us a 'baseline' scenario based on a simple forecasting methodology – suggests that it is unlikely, *ceteris paribus*, that the EU will change course.

In the diagram below the labelling of the x and y axes within the context of the widening/deepening framework produces four 'cells':

- (1) Europe as a 'marketplace'
- (2) Historic policy 'continuation'
- (3) 'Unravelling' of the European project
- (4) Europe as a 'temple'

In what follows we will seek to expand upon scenarios (1) and (4). As noted above, scenario (2) has, to all intents and purposes, been covered in section 4 of the scenario base, while scenario (3), while interesting in itself from the perspective of the dynamics of disintegration, is essentially a *null hypothesis*, and as such is too radical and negative an outcome to be of much use in the construction of the final integrated scenario.

¹ Translated into the rhetoric of enlargement this basically means 'never say never.' The practical reality may be that countries like the Ukraine, Armenia and Morocco will never be allowed to join the EU, but the EU's strategy remains one of avoiding, as far as possible, being placed in a situation where a definitive decision either way must be taken. This is why the ENP is designed, culturally and institutionally – using the traditional INTERREG 'model' – to prepare participants for a future that is 'much closer' to the EU, but where accession *per se* is not 'on the table.' The Prodi formula of offering to share 'everything but the institutions' then is proffered in the hope that ENP participants will ultimately be satisfied with an 'EEA-style' relationship with the EU, rather than full membership.

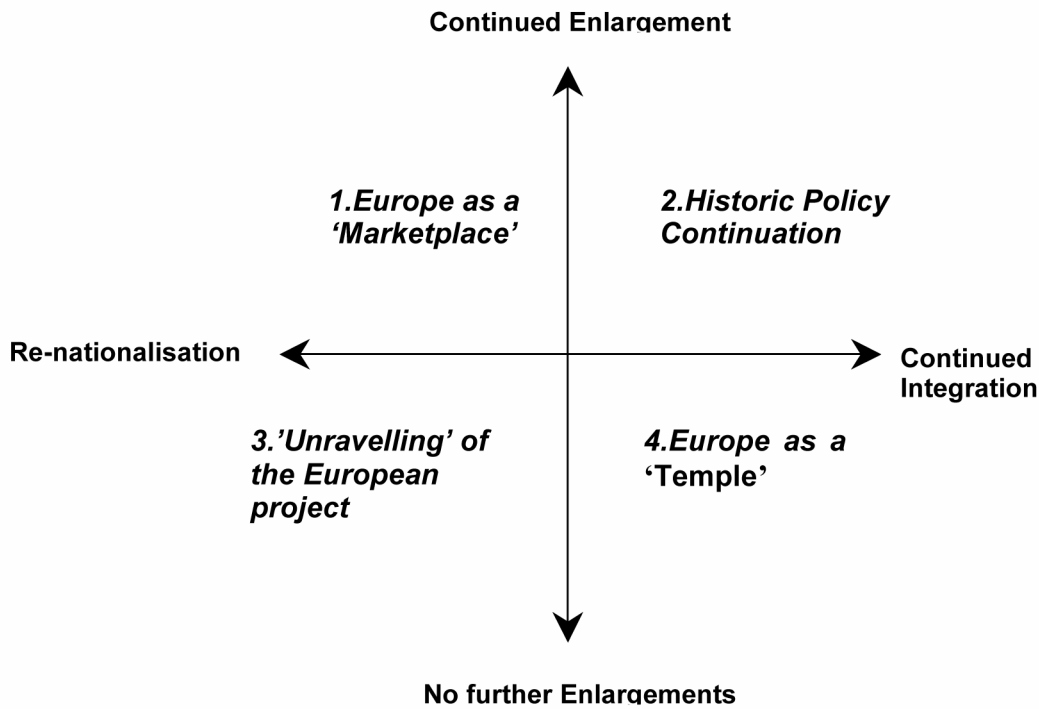


Figure 30 Creating the Scenario Field

The vertical axis tracks the question of enlargement, while the horizontal axis that of integration. In *cell 2* we have the forecast scenario, where the implications of current policy practice are telescoped into the future, the assumption being that – as has historically been the case – further pulses of integration and enlargement, or deepening and widening, will continue to provide the most likely pattern of future developments. In *cell 3* we see a basic unravelling of the European ‘project’ as further enlargement is halted indefinitely while the process of integration is increasingly undermined by a radical phase of ‘re-nationalisation’, with power – in a legal if not actually in a practical sense – increasingly reverting back to the nation-state level. In *cell 1* we can postulate what may happen if the enlargement process continued while the goal of deeper integration was set to one side. This scenario would see the EU – as a specific regional economic institution – decrease in relative importance in the face of ongoing globalisation, yet potential candidates for EU membership would still exist because the EU would now be seen, regionally, as the *political guarantor* of global economic integration. Finally, in respect of *cell 4* we can postulate that a focus on deeper integrative goals at the expense of further enlargement sees the emergence of a much more particularistic and ‘inward looking’ entity, where bold new schemes, relating perhaps to issues such as sustainable development, are undertaken within the EU but this occurs only at the expense of creating an increasingly brittle external border as the differences between ‘inside’ and ‘outside’ increase dramatically.

2.6.2.2 Scenario Category

In this section we will try, briefly, to outline the thinking behind our scenarios, and in particular our approach to their construction. The scenarios outlined below are of the *prospective* type, as laid out in the notes from the TPG meeting of 2-3/12/04, and in more detail in the ESPON 3.2 First Interim Report of 31/05/04. As such they include elements

relating both to potential changes in respect of the *driving forces* outlined in Section 3 of the 'Enlargement' scenario base document, where significant change occurs in the behaviour and actions of the principals (i.e. the Member States, the Commission, and potential candidates for EU membership), as well as in one or more areas of public policy (i.e. prospective policy scenarios).

The assumptions behind the occurrence of such changes then relate to potential changes in the perceptions of the principal actors, where for example a significant change in political perceptions leads to a change in public policy.² As the scenario base document argues at some length however, there are a number of reasons to believe that – given the continuation of current assumptions – a significant change in EU policy is unlikely to be generated by endogenous factors (i.e. the driving forces for 'enlargement' outlined in Section 1.6.1.3 of the scenario base document) alone.

As such, for the foreseeable future, it is likely that the core members of the EU will continue to see 'instability' as a threat and thus see a 'stability policy' as the major counter to this. In addition, the economic model of integration is likely to continue to prove attractive to those on the outside, not just for the obvious 'economies of scale' and 'transaction cost' reasons in respect of single markets and currencies, but also because economic integration is now seen as the essential 'glue' for wider political processes.

Similarly, potential candidates for EU membership will, in all likelihood continue to be driven, ultimately, by the perception that it is a major disadvantage to have an 'arbitrary' barrier (i.e. the external EU border) placed between them and their neighbour(s). Such countries are moreover acutely aware of the fact that even the promise of 'future' EU entry brings with it significant disadvantages, if ones neighbours (and potential political rivals and/or traditional economic competitors) are already members, and are thus able, to some extent, to shape the entry conditions offered. The 'fear of being left behind' looks set then also to remain a potent force.

Finally, in terms of endogenous driving forces, the power of the EU institutions, and in particular the Commission, to cajole the Union forward in times of crisis, as in the early 1980s, or to articulate a 'vision' for the future as Romano Prodi did as EU Commission President in the late 1990s is much less easily discernable, relating as it does to the outlook of a small group of people.

What then could markedly change these perceptions? It is obvious that significant change is more likely to be precipitated by developments relating to factors exogenous to the specific enlargement process, though by their very nature such factors are of course more difficult to predict.³ These may either take the form of fairly predictable (i.e. already identified as low probability/high impact) events, such as for example the emergence of a less-cooperative Russia on the EU's periphery, the descent into a major 'civilisational clash' with the nations of Islam, or the occurrence of a major global financial or environmental crisis. Or they could become manifest in the form of 'wild cards' that perhaps nobody has as yet foreseen. It is here then that the methodology of the mere extrapolation of past events no longer suffices. Yet it is not particularly helpful if we attempt to drive our prospective scenarios by relying solely on a procession of 'wild cards' or low probability/high impact events. As such then, it is important that we endeavour to identify, in general terms, what the key medium-term issues for Europe are likely to be, and from this we can generate a

² It is conceivable also that a routine change in public policy subsequently precipitates a fundamental change in political perceptions, though this is perhaps less likely.

³ Perhaps, in the short term, the major 'endogenous' exception to this is the debate over the ratification of the European Constitution. Undoubtedly this decision will have a significant effect on the future course the EU adopts.

number of plausible scenario 'breakpoints,' many of which will have a territorial or spatial component.

In addition to the particular (i.e. endogenous) and wholly predictable 'breakpoints' facing the EU, such as the ratification of the new EU Constitution, the continuing dynamism – or otherwise – of the Commission, the need to maintain cohesion, and the success of the ENP in limiting the demand for future enlargement⁴, we can also see that Europe in general – and the core states of Western Europe in particular – are currently also facing a number of major, interlinked and often intractable 'crises' (for want of a better term). These 'crises' generally relate to the problems faced by what has been variously termed the 'post-industrial', 'post-material', 'post-national' or 'post-modern' state, with a particular emphasis on the problems emerging from the decline in 'productivist' and 'welfarist' values and the changing nature of the way in which society is therefore structured. As such then we are often told of the emerging 'fiscal', 'demographic', 'pensions', 'production' or 'identity' crises (i.e. perhaps encompassing a backlash to continuing immigration) that are about to engulf us. These medium-term issues are then likely to have a significant impact on future EU developments in the period 2005-2030, (even though, at present, they are predominantly national rather than EU-level issues *per se*), particularly as they interact with the entirely predictable 'breakpoints' already outlined above, and for good measure with the occasional 'wild card'.

2.6.2.3 Underlying scenario hypotheses

2.6.2.3.1 *Of markets and temples...*

The choice of these labels was made to help us better characterise our scenarios. The notions of *market* and *temple* were chosen because of the evolving nature of their intimate interrelationship in European historical consciousness, as for example can be seen in respect of the examples of the *Agora* of Athens and the *Forum Romanum*. Both of these sites originally combined the institutions and infrastructure of the *market* and the *temple* – usually at opposite ends of a central square complex – and as such this relationship provides a metaphor for the EU today where policy is designed to maintain a balance between diversity and durability, coherence and cohesion, deepening and widening etc.

We should however be aware of the fact that there is an alternative, though of course still mainstream view, that the workings of these two sets of institutions should remain separate – basically that the baser workings of the marketplace should not be allowed to 'infect' the purer form of what is created and/or maintained in the temple. In this sense then the *marketplace* represents a society where tangible, or more precisely, fungible goods are seen as the arbiter of things, while the notion of the *temple* represents a society where rather more intangible and less materialistic beliefs are seen to predominate.

Care should of course be taken in trying to stretch this metaphor too far however as, in reality, neither notion is ever likely to be acted out in policy terms to the complete exclusion of the other. As such then they function as useful 'illustrative devices' to better differentiate and characterise the potential choices/possibilities available, and to highlight perhaps the deeper forces behind what would amount to a fundamental change in the EU's direction, and thus a significant move away from the current policy trajectory, as expounded in the scenario base section.

⁴ We know with some certainty that many of these issues will play a significant role in future developments, and although they have already been factored into current calculations in respect of the 'trend scenario' they could potentially turn out to be much more problematic than that scenario initially envisages.

Scenario 1: Europe as a 'marketplace'

This scenario postulates that the *marketplace* increasingly becomes more important than the *temple*. The forces of marketisation, individualism, liberalism, and de-centralisation (from the EU-level at least) win out as *intergovernmentalism* prevails over *federalism* in the EU, and the choice is thus made for *widening* over *deepening*. The EU contracts in terms of functions to conform to the liberal ethos of the 'night-watchman' state, providing only for 'soft security' and the overseeing of the proper and unfettered functioning of the market, introducing also, where necessary, a measure of *variable geometry*⁵. The *raison d'être* of the new EU is enshrined as the Lisbon goal of 'competitiveness.' The EU Constitution is ratified to consolidate this vision, while the EFTA/EEA states (Norway, Switzerland, Iceland) as well as Turkey and the Western Balkan states all accede to membership of the Union before 2030. The EU however becomes far less cohesive given the difficulties of integrating so many new and, for the most part, relatively poor members in such a short space of time. The main objective of the European Neighbourhood Policy (ENP) is to promote the establishment of Free Trade Areas in the large neighbourhood zones on the EU external border in the Mediterranean region and in the states of the former Soviet Union. EU Cohesion Policy is gradually nationalised, as it is assumed that the member states themselves can better deal with the question of regional disparities. As a result, the EU's Structural and Cohesion Funds are essentially starved of resources, and thus the pressure of enlargement on the EU budget is lightened considerably.

Scenario 4: Europe as a 'temple'

The 'historic mission' of Europe has always been about more than simply economics and the provision of welfare, in a material sense. The essence of the 'experiment' has always been about undertaking an innovative approach to international affairs, and to the problems of the modern world. It is this light then that this scenario postulates that the *temple* remains as a fundamental constraint on the 'invisible hand' of the *marketplace*. The Lisbon goal of 'competitiveness' is still highlighted; though its implementation is now handled rather differently as the Gothenburg principles in respect of 'sustainability' are given a more prominent role. Here the broad forces of communitarianism, welfarism, sustainability, and integration continue to temper the 'market-centred' *intergovernmentalist* approach, while a choice is made for *deepening* over *widening*. As such, only Romania and Bulgaria – to whom promises were already made – gain entry (the EFTA/EEA members declined to apply), while Turkey is finally denied entry once and for all. Europe then concentrates on acting as a 'torch bearer' for sustainability and for the new 'hydrogen' economy which attempts to integrate environmental, welfare and territorial cohesion concerns in an attempt to develop a 'Euro-centric' approach to the demands of globalisation. This can however only be done through further integration, which in itself is only practical if it is undertaken on the basis of the 'variable geometry' approach. Increasing tension however arises between the 'inner' and 'outer' cores over the *ad hoc* nature of the variable geometry approach, and in particular over the costs involved, causing some in the 'outer' core to contemplate leaving the Union altogether. Meanwhile, the potential for the Union's 'neighbours' – now certain of their 'marginalised' status to become increasingly troublesome increases.

⁵ The notion of 'variable geometry' was coined originally in relation to the emerging European security debate of the 1980s, where different bodies carried out different tasks in the security field. It has since come to encapsulate a much wider vision of the EU experience where rather than one uniform approach being taken, issues are addressed in different ways by varying groups of states, and/or at different speeds. EMU is a good example of this process in action.

2.6.2.4 Scenario Line

2.6.2.4.1 Europe as a 'marketplace'

After much debate, the EU - driven by the more sceptical anti-federal members - decided on the need to focus on widening at the expense of deepening. The major reason being that for the EU to effectively compete with the other global trade zones in North America and East Asia, the primary objective remained the need to *quickly* become the most innovative and competitive economy in the world (i.e. the Lisbon strategy). As such, the fundamental improvement of its economic performance required the further, and indeed substantial, widening of the internal market and its socio-economic disciplines to those territories still outside the EU.

As the power of market forces remained a major driver of enlargement, the internal market and the EMU constituted the institutional context in which such forces were given free reign to operate, with the process of policy and market competition determining to what extent differences between Member States could be maintained with respect to welfare state and other arrangements.

The driving force here was the desire by many of the larger contributors to the EU budget (i.e. Germany, the UK, the Netherlands and Sweden) to ensure that the projected shifts in aid flows in the EU25+ would not entail the need for a 'blank cheque' to be written to the new members, as the size of the Regional Aid budget was predicted to rise by some 50% merely to cope with the new 2004 entrants. In addition, the main recipients of such aid in the former EU15 'fell into line' with the tough stance adopted by the major contributors as they themselves were set to lose most of their aid in any case. Indeed, Ireland and Spain would now become 'net contributors', with Portugal and Greece retaining only a small amount of aid for their poorest regions

After the 2004 enlargement, technological advances and new forms of production raise substantially the number of jobs in the new high technology fields in the old (EU-15) centres of innovation, replacing lower level production and service jobs. These latter jobs were then displaced to the new Member States. For various reasons, relating in particular to the availability of skills and the material and business infrastructure however it was to the capital regions, i.e. to cities such as Warsaw, rather than the peripheries, that these jobs went. As such, though this was beneficial in terms of European polycentric development at the national level it significantly increased disparities at the regional level because of the difficulty of dealing with Foreign Direct Investment in a primarily endogenous strategy for growth. This process moreover is ongoing, as while, in 2005, the region around Warsaw was a major importer of semi-skilled manufacturing jobs previously located in Germany, by 2012 it was beginning to create a significant amount of its own more highly skilled high technology jobs, particularly in the computer processing field. Moreover, by 2021, the lower level production and service jobs were being re-exported to the neighbouring countries, giving a significant boost to the development of those neighbouring the EU in areas such as Cairo and Kiev. By 2026, the new (2004) Member States' high-tech companies were themselves beginning to export production and service tasks to the centres of the neighbouring EU zones.

A majority of the Member States began to give priority to widening at the expense of deepening as, by 2008, the EU constitution was finally ratified after a number of the more sceptical countries had held second referendums to overturn the original 'no' votes. Given

the level of scepticism over the Constitution it quickly became clear that a choice had to be made between continuing with the widening process or 'taking stock', with a view to refocusing the EU's efforts on deepening once again. In the meantime, the aspects of the Constitution relating to subsidiarity and States' rights were given prominence over grand schemes for further integratory projects.

The basic choice facing the EU thus concerned the tension between the centralisation and the de-centralisation of powers, which was perhaps exemplified most clearly in the final decision of 2013 taken on the basis of the report by the 2nd High Level Expert Group (i.e. The Tarschys Report), and designed to coincide with the end of the 2007-13 financial period, to renationalise both the CAP and Regional Policy. Significantly however although the need for 'growth' was again stressed as paramount this was no longer, as was the case in the Report of the 1st High Level Expert Group, couched within the context of the risks of 'non-growth' to *further integration*. Growth was now seen as *the end in itself*, not merely as the means to support further integration.

It was the debate over this issue in particular then that finally brought to the surface the deeper tensions that had existed, at least since the abortive discussions on the meaning of 'subsidiarity' in the early 1990s, over the issue of de-centralisation. Moreover, the impending entry of Turkey, envisaged sometime after 2015, which would bring the EU up to 32 in size (Romania, Bulgaria and Croatia having joined in 2007, Norway, Iceland, Switzerland in 2012) further exacerbated tensions in this regard. A point that was duly made in the conclusions to the 5th Cohesion Report published in 2016.

From here onwards the integration process then began to evolve in a much more 'intergovernmental' direction. Increasingly then the EU's responsibilities were confined to those policies that were deemed relevant to the maintenance of the internal market, e.g. commercial, fiscal and transport policies, with the supranational level's role in welfare, environmental, and other policies being reduced to a minimum, and often – in the context of the pervasive mood in respect of subsidiarity – simply re-delegated to the national level. Moreover, where the EU was able to maintain its position in the policy hierarchy this was generally done within the context of *variable geometry*.

A significant amount of time and political capital was however devoted to neighbourhood relations, and to what Romano Prodi called 'the completion of Europe,' namely, the accession of the countries of the Western Balkans. This, together with Turkish accession, was a long and arduous process, which was not finally completed until 2022, thus bringing the membership roster up to 38 with, Turkey, Albania, Serbia, Montenegro, Bosnia-Herzegovina, and the FYR of Macedonia all acceding at this point.

Within the context of the European Neighbourhood Policy (ENP) a number of European Neighbourhood Agreements were also unveiled between 2008 and 2013 with the Maghreb and Mashreq countries. Moreover, with the emergence of the Mediterranean Free Trade Area in on a solid politico-economic footing 2020, the Southern and Eastern Mediterranean countries were now better placed than ever to contribute to the development of the region as a whole.

The main policy objectives in respect of the states of the former Soviet Union remained assuring political stability and reinforcing democratic institutions and the free market. Ukraine, Moldova, Armenia, Georgia and Azerbaijan all moved forwards in the Neighbourhood 'process'; while countries such as Turkey, Romania, Slovakia and Poland supported future entry for their neighbours, though by 2030 these countries still had not been granted an entry 'perspective'.

2.6.2.4.2 *Europe as a 'temple'*

Sustainable development and 'renewability' (the Gothenburg 'goals') became the driving forces of the post-industrial economies of Europe. Competition could not realistically take place with the newly industrialising and emerging market countries on the basis of reduction to the cost base. Rather the need to add 'value' was seen as the correct approach. Europe's competitive advantage lay in doing things cleaner, more quietly and at less cost to the environment. As such, though the Lisbon 'goals' of greater competitiveness remained important, this was so only to the extent that they were buttressed by the wider 'Gothenburg agenda'.

The impetus to move in this direction was given by the speedy ratification of the EU constitution in 2007. Although, initial misgivings existed among some sections of the populace, it was quickly acknowledged across the board that the measures contained within the Constitution, particularly in respect of its approach to institutional and voting arrangements, were vital if the EU was to maintain any semblance of coherence, politically. Moreover, the internal market reforms needed necessarily entailed further economic integration to be undertaken.

Although the Constitution – within the context of subsidiarity – set out the limits of rights and responsibilities between the Union's constituent parts, its effect was actually rather more profound. In effect, rather than simply drawing a legal border between what was, and was not, a power reserved to the Union, in typical 'neo-functionalist' style it generated the potential for many new forms of political spillover to occur, as effective functional cooperation in one field suggested the need for further beneficial cooperation in another contiguous area.

Perhaps the first concrete indication of this emerged in the context of the debate over the remodelling of the Union's Cohesion and Regional policies that took place in 2006 in the aftermath of the 2004 enlargement. At this point, a significant body of opinion existed arguing that we should, in effect 're-nationalise' these policies. The impact that the Structural Policies in particular had on cohesion, it was argued, was minimal, and the costs of enlargement were set to grow exponentially some claimed, particularly in the period after 2013 when the new financial perspective would need to be put in place, at the same time as the 'GDP subsidies,' in the form of fiscal transfers from the core members to the 2004 entrants, reached their peak.

Such concerns generally reflected the view that enlargement had been taken as far as was feasibly possible. Indeed, the accession of Bulgaria and Romania scheduled for 2007 was drawn out for over three difficult years of final negotiations, and it was not until the beginning of 2010 that they were allowed to accede. While under the pretext of failing to comply with the EU's 'conditionality' clause over the surrendering of those indicted for 'war crimes', Croatia's application was eventually denied. The entry of Bulgaria and Romania rekindled old arguments over 'who pays' for enlargement, effectively poisoning the debate over the Structural and Cohesion funds for some time to come. Moreover, the bureaucratic *driver* which saw the process of enlargement being tied to that of integration more generally, with the Commission as the main 'cheerleader' for this approach was decisively checked when, in 2009, a number of Commissioners made it clear that 'enlargement could go no further.'

Although the 'integrationists' appeared to have won a significant battle here at the expense of the 'globalists,' the price was rather high, in that the only way to now avoid the emergence of a *Europe a la carte* was to officially endorse *variable geometry*, essentially, endorsing a multi-speed Europe.

In this light, the need to straighten out 'once and for all' the issue of how the goal of cohesion was to be paid for, and at what level it was to be implemented at, effectively concentrated minds on the need for deepening at the expense of widening. Debate over this issue was further focussed by the impending entry of Turkey, though its continuing refusal to recognise the legitimate Government of Cyprus provided an effective block on accession as the need to deal with this issue had been explicitly raised at the outset of the Turkish negotiation process in 2004.

The years after 2010 were however to prove some of the most difficult and indeed darkest in the history of European Integration, as concerns over budgetary issues and re-distribution/cohesion became interlaced with what can only be described as an anti-globalisation 'backlash' across large parts of the Union, specifically in respect of both 'economic' and 'identity' issues.

There were essentially three elements to this. In terms of 'identity issues' two separate groupings of disgruntled Member States could be identified. Firstly, the then still 'new' Member States of 'Catholic Central Europe', such as Poland and Lithuania – with no small measure of support from France – argued vocally against the widening of the Union to include non-Christian countries. They argued that the social consequences of such a significant 'cultural' widening of the EU would be disastrous. A second group of countries also sought to prevent further widening, again citing its potentially disastrous social consequences, in particular with respect to the tensions raised by the fear of further immigration, particularly from Turkey. Paradoxically, included in this group were some of the countries with, historically speaking, the most 'liberal' immigration policies in Europe, i.e. countries such as Denmark and the Netherlands, backed by Germany and Austria.

In more purely economic terms, Sweden, Spain and Ireland became increasingly hostile to further enlargement because of what they saw as the unenviable economic and fiscal consequences it had for them. Not only were they expected, in effect, to 'export' medium-level skilled jobs to the new member countries (a process that began after the 2004 enlargement, and continued with the accession of Romania and Bulgaria in 2010), but they were now also expected to increase their contribution to the EU's cohesion goals through continuing fiscal transfers. Such a situation was of course nothing new for long-term integration sceptics such as Sweden, but to those, like Spain and Ireland, that had benefited themselves for so long from such transfers it came as a rather rude awakening to so abruptly join the ranks of the EU's 'net contributors'.

Similarly, the effective de-coupling of the 'widening' and 'deepening' processes signalled an end to the EU's perceived 'civic duty' function in the context of enlargement, as it was now increasingly felt that 'the time for sentiment was over' and with communism a fading memory for most, the EU would now increasingly seek to impose the most stringent criteria on prospective entrants. It was this context that the EU finally rejected Croatia's application for membership in 2008, and in 2017 the EU informed Turkey that it was suspending indefinitely accession negotiations on the basis that Turkey had not yet recognised Cyprus and was indeed still in 'possession' of the northern half of the island.

The underlying reason for this decision was however that important core EU members were still un-reconciled to the EU admitting such large and diverse 'non-European' countries into the Union, with the whole debate over Turkish entry effectively being derailed by the rise to power of anti-immigrant/anti-Muslim parties in Austria in 2014 and in the Netherlands in 2015.

Problems in respect of Turkey however merely mirrored the wider issue of the EU's relations with the Islamic world. Increasingly across the region manifest tension arose between some

sectors of the governmental elites of these countries who hoped that the economic benefits of Mediterranean free trade would help stabilise their uncertain political legitimacy, and the vast majorities of their populaces enraged by other elite factions who either saw the agreements as economically inadequate, or who took a wholly different view of the acceptable level of interaction across the Mediterranean.

As such, the Mediterranean Free Trade Area never materialised, while the ENP in the Southern and Eastern Mediterranean proved to be either 'too little' or 'too much' depending on the view of the recipient. This inevitably however had a significant effect on the whole process of integration as EU 'influence' across its southern border declined dramatically. In addition, the failure to beneficially 'engage' the countries of the EU's southern 'border' had not only the inevitable security implications in a conventional sense, but the significant differences that were subsequently to emerge in terms of environmental standards threatened to dwarf even the most pessimistic security projections in terms of the potential scale of its implications.

The period after 2020 also witnessed the harsh reality of the long-term downturn in European fertility rates, with the impact that this has had on the age dependency ratio of elderly retirees to current workers. The demographic 'crisis' and by extension also the fiscal 'crisis' in respect of pension payments and the level of welfare spending was of course further exacerbated by the drastic downturn in immigration levels, particularly those of working age into the EU witnessed by the decision to effectively end the process of enlargement after 2010.

By 2020 then the EU was in significant difficulty and in retreat across many fronts. Indeed, the inevitable squabbles that resulted from the move towards *variable geometry* combined with the problems over the immigration and enlargement issues, and the wider problems of a fiscal and/or economic nature saw the inherent tensions between the Member States, the Commission and the EU's neighbours stretched almost to breaking point, with a number of Member States (i.e. the UK, Denmark, and Sweden) contemplating, for various reasons, withdrawal from the Union as they individually perceived the general 'bargain of membership' to be becoming increasingly unpalatable.

It was at this point that the decision to move towards the 'hydrogen economy' was taken in an attempt to end the EU's unsustainable over-dependence on fossil fuels. The adoption of this strategy was highly controversial, but with the promises of Kyoto still remaining largely unfulfilled, particularly in terms of the emission of greenhouse gases, significant glacial erosion ongoing in Antarctica, and nineteen of the twenty warmest years on record in Europe occurring between the years 2000 and 2020, the time for rather more drastic action had come. The Commission played the leading role here in gathering together the 'critical mass' of countries necessary to move forward.

The new approach brought with it a significant level of seed-financing in terms of encouragement for the knowledge and innovation based economy that was needed to successfully attain the EU's wider economic sustainability goals, and this in turn encouraged something of a *renaissance* both in the need for general across the board integration (as opposed to the variable geometry that had existed since 2009) and in the economic fortunes of some of the rural and FPU areas that had been in decline, at least since the start of the century. As such, the question of cohesion was effectively solved for the foreseeable future at least by the dynamic gains made in terms of general economic growth and development with new 'clean' technologies as its main driver.

In conclusion, though success had eventually come, significant problems remained, in particular the need to effectively re-model relations with those beyond the Union's now *permanent* external border. Indeed, the gains made across the EU after 2020 in terms of

cohesion, economic vitality and sustainability cannot be maintained if the issue of political stability *beyond* the external border is ignored. As such, for many of the EU's neighbours, accession will – EU declaratory policy notwithstanding – remain their ultimate goal, while others want relations to be kept at 'arms length'. Ultimately however the EU cannot exist in isolation of its neighbours.

2.6.2.5 Specific spatial impacts / Territorial cohesion

2.6.2.5.1 Analysis of the 'Market' Scenario

The population size and the GDP level of the recent and future accession countries

As we have already seen, the accession of both the 10+2 states and Turkey will add considerable surface area and population, while offering only a small additional amount of GDP. The changes in these dimensions are presented in Table 20 of the baseline scenarios. We repeat below this table in which we have added data on the % difference of the EU-36 (EU27 +PAC) from the EU27 concerning the surface, the population, the *per capita* GDP in PPS and the *per capita* GDP in PPS as a % of the EU25 average (as well as that of the EU27 average).

The resulting data suggests that the accession of the PAC to the EU27 would raise the surface of the EU27 by 35%, its population by 22% and its GDP by only 8%. Inversely, the average *per capita* GDP would lower by 8% and 11% compared to the EU27 on the basis of EU25=100 and EU15=100 respectively (data for 2004).

| | SURFACE AREA | POPULATION - Millions - 2004* | TOTAL GDP - Billions EUR 2004* | TOTAL GDP - Billions PPS 2004*** | PER CAPITA GDP PPS 2004*** | AVERAGE PER CAPITA GDP PPS (EU25 = 100) 2004*** | AVERAGE PER CAPITA GDP PPS (EU15 = 100) 2004*** |
|--|--------------|-------------------------------|--------------------------------|----------------------------------|----------------------------|---|---|
| EU15 | 3.244.479 | 383,7 | 9731 | 9311 | 24267 | 108,8 | 100,0 |
| New 10 member c. | 734.059 | 74,0 | 477 | 897 | 12117 | 54,3 | 49,9 |
| EU25 | 3.978.538 | 457,7 | 10208 | 10208 | 22303 | 100,0 | 91,9 |
| Bulgaria, Romania | 348.873 | 29,7 | 76 | 204 | 6860 | 30,8 | 28,3 |
| EU27 | 4.327.411 | 487,4 | 9783 | 10411 | 21361 | 95,8 | 88,0 |
| Turkey | 769.604 | 71,4 | 245 | 464 | 6500 | 29,1 | 26,8 |
| W. Balkans | 264.482 | 24,4 | 5788 | 109 | 4487 | 20,1 | 18,5 |
| Norw., Switz, Icel. | 468.510 | 12,1 | 506 | 372 | 30657 | 137,5 | 126,3 |
| Potential Acc. Countries (PAC) / Scenario 1 | 1.502.596 | 107,9 | | 945 | 8760 | 39,3 | 36,1 |
| EU27 + PAC | 5.830.007 | 595,3 | | 11357 | 19077 | 85,5 | 78,6 |
| EU27 / EU25 | 8,8 | 6,5 | | 2,0 | -4,2 | -4,2 | -4,2 |
| EU27 / EU15 | 33,4 | 27,0 | | 11,8 | -12,0 | -12,0 | -12,0 |
| CHANGE EU27+ PAC / EU27 % | 35 | 22 | | 9,1 | -10,7 | -10,7 | -10,7 |

Table 22 Impacts of previous enlargements of the EU as well as the PAC accession

*, **, *** See the remarks for the Table 20 of the baseline scenarios (section 1.6.1).

Impact of the accession of the PAC on the 'catching up process' and on the eligibility for assistance

On the basis of the current data and eligibility criteria, the entire territory of Turkey as well as that of the W. Balkans⁶ would be eligible for assistance under Objective 1 of the Structural Funds in addition to assistance under the Cohesion Fund.

In the baseline scenario we attempted to evaluate the impact of the accession of the 10+2 states on the eligibility for assistance with the aid of two 'catch up' scenarios. The first sees growth being maintained in these countries at 1,5 % a year above the EU15 average, while the second sees it sustained at 2,5 % above the EU15 average. We have now extended this analysis concerning the 10+2 countries to include coverage of the PAC.

As we noted previously, the continuation of the current approach to structural / cohesion policy in the 'trend' scenario, which stands as a middle course between widening and deepening, could lead to 'catch-up' rates in the 10+2 countries fluctuating between those of the first catch up scenario and those of the second.

In the framework of the *Market Scenario* emphasis is given to widening and to market liberalization in the enlarged EU, while structural policies are eventually, in effect, re-nationalised. In order to evaluate the effects on the eligibility for assistance in the framework of the Scenario 1, we have thus created a proper 'catch up' scenario. We assume that the 'above the EU15 average' growth rate is sustained at 1,5 % for the 10+2 countries, as well as for the 'poor' future accession countries: Turkey and those of the Western Balkans (i.e. 4% a year if growth is 2½% a year in the EU15). This difference of 1,5% might be even lower. Provided that the estimates we give are indicative, even if the 'above 1,5%' is lowered a little (indicatively, by 0,2-0,3%), the substance of the results will not change. In any case, in the framework of this 'catch up' simulation, less than 1% (of the total 2,5 %) is owed to the Cohesion policy. We have also taken into account the fact that SF / Cohesion Fund aid will be allocated to the three EU15 Cohesion countries (Spain, Greece, Portugal) for some period of time after 2005, with an agreement for the programme period 2007-2013 already existing.

The aid that will be allocated to the 'new neighbouring countries' (remaining outside the EU during this period, such as for Moldova and the Ukraine etc) will be limited, consequently we estimate that the % in growth rates in such cases will equal that of the 10+2 new Member States. We also take into account here the fact that high growth rates are justified for new neighbouring countries provided that their initial economic base is very low. Finally, the EEA/EFTA countries growth rates are expected to equal those of countries of EU15.

In the Graph below we present the time moments in which the GDP of the EU15, the three EU15 Cohesion countries, Turkey and each of the Western Balkans states⁷ will reach 60%, 75% and 90% of the EU25 *per capita* GDP.

⁶ Including Croatia

⁷ This analysis assumes that Serbia and Montenegro do not in fact separate and that Kosovo remains part of Serbia.

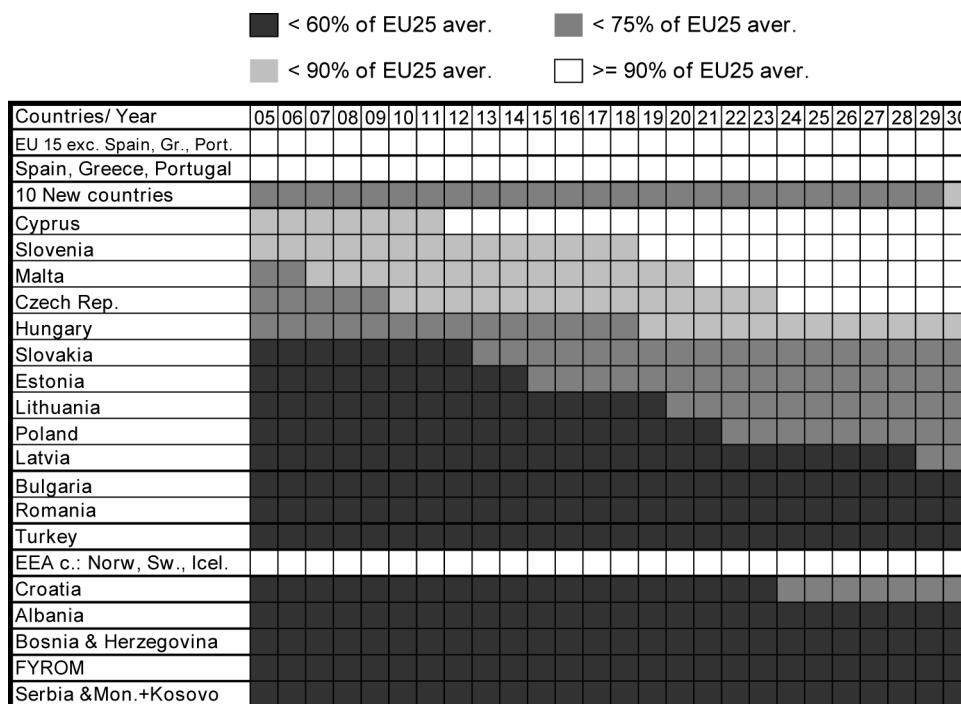


Figure 31 Scenario 1 – Simulation of GDP per head (PPS) in the EU27 + PAC countries 2005-2030

(See text for the inherent assumptions)
 For the data sources see Table 21 notes.

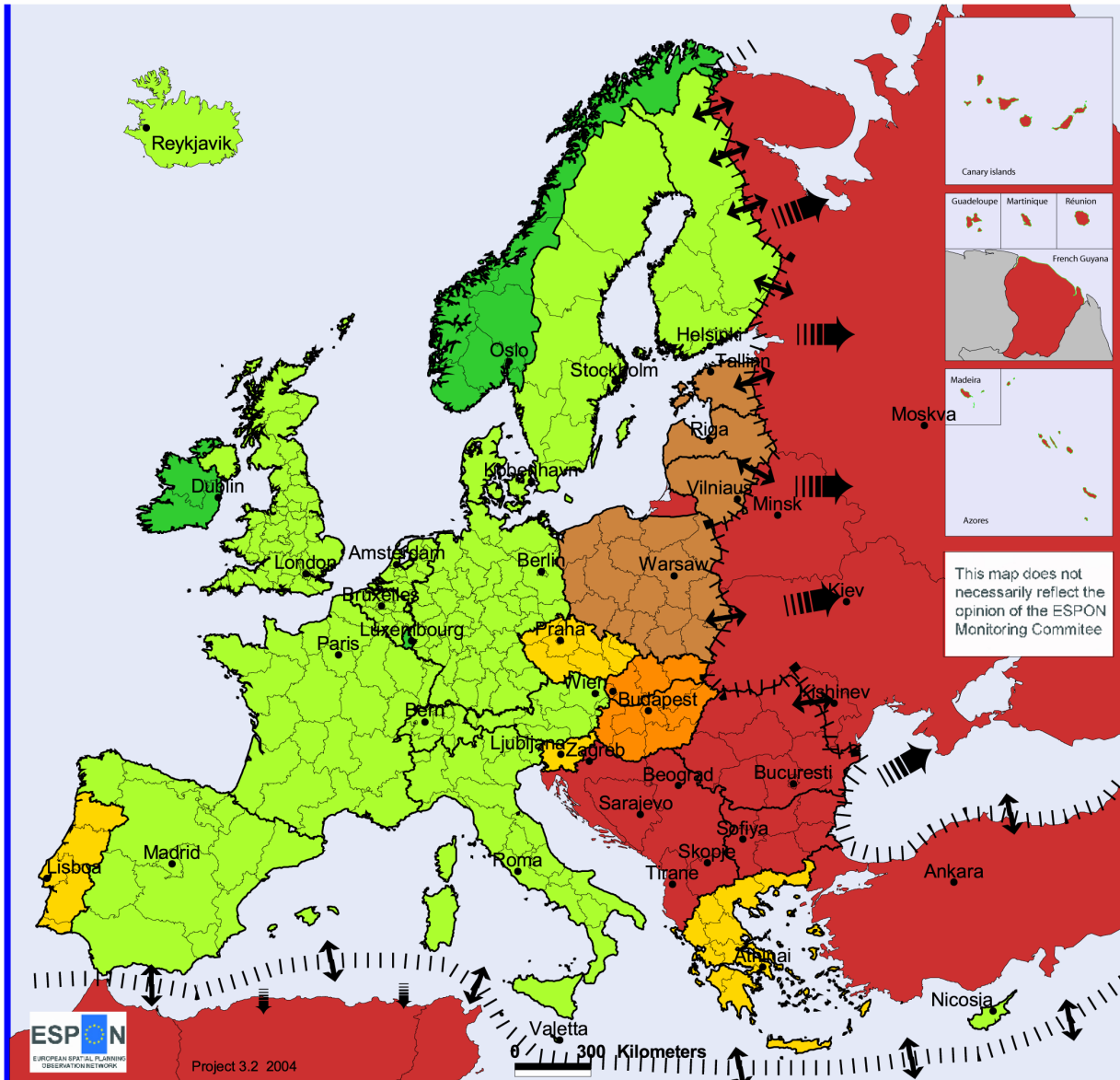
Final image – Impacts on territorial cohesion

From the data produced we conclude the following. The average *per capita* GDP of the 10 new Member States (of 2004) will reach 75% of the EE25 average by about 2030. More specifically, the average GDP of half of these countries will not reach 75% of the EE25 average before 2030, while in the middle of the 2005-2030 period the GDP of three of them will not have reached even 60% of EU25s GDP average. *Per capita* GDP of Bulgaria, Romania and the Western Balkans states (excepting Slovenia and Croatia) will still not have reached 60% of the EU25 GDP average by 2030. Therefore, on the basis of the *Market Scenario*, disparities across national GDPs in the EU36 would be much larger than that either for the EU25 or the EU27.

The same applies in respect of regional disparities. Turkey’s eastern regions together with some regions of the Western Balkans will have the lowest *per capita* GDP in the EU36. We will specify the effects on disparities among regions using the above simulation in the next phase of the project. We forecast then that the difference between the neighbouring (outside EU36) states’ *per capita* GDP and the EU27 average will not dramatically decrease in the period 2005-2030.

The final image of the disparities in *per capita* GDP for the EU36 and the neighbouring countries is shown in the map below. The corresponding values have been calculated on the basis of the above simulation. We have tried to illustrate in this Map the two main aspects of the Market Scenario, namely, the lowering of the ‘barrier’ between EU and the neighbouring countries and the lack of cohesion between national territories in the EU.

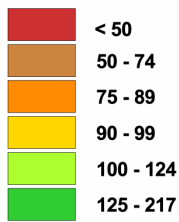
Enlargement Scenario 1: "Widening: / "Europe as a marketplace"



This map does not necessarily reflect the opinion of the ESPON Monitoring Committee

Final image:
Low EU integration

Simulation for 2030
GDP per head PPS
Index, EU25=100



Eurogeographic Association for the administrative boundaries
Origin of data: Eurostat

Basic options

- EU25 + Bulgaria, Romania, Croatia
- Further enlarg.: Turkey, W.Balkans, EEA c.
- Light barrier between EU / non EU
- Strong Extension trend
- European Neighb. Policy: (ENP): Support Free market in Neigh. Areas

- "Declining" EU Cohesion Policy:
-> Growth is maintained in EU36 Cohesion countries at 1,5 % a year above the EU15 average

Figure 32 Enlargement Scenario 1: 'Widening:/'Europe as a marketplace'

2.6.2.5.2 Analysis of the Temple Scenario

Discussing the implications in regional disparities and EU structural policies

In the framework of this scenario, only Bulgaria, Romania and Croatia accede to the EU25 during the period 2005-2030. Turkey, the rest of the Western Balkans and the EEA/EFTA states are thus considered here as 'neighbouring countries'.

The population size and the GDP level of the recent and future accession countries

The corresponding changes in EU area, population and GDP are also described both in the baseline scenarios and the Market Scenario (See Table 22 of the Market Scenario).

Impact on the 'catch up process' and on the eligibility for assistance

On the basis of the current data and eligibility criteria, the entire territory of Bulgaria, Romania and Croatia will be eligible for assistance under Objective 1 of the Structural Funds, as well as for assistance under the Cohesion Fund. In the framework of the Temple Scenario, emphasis is put on deepening (integration) through the intensification of the EU's structural policies. The EU's borders are seen as a strong barrier separating the EU from its neighbouring countries. We will show however that this barrier also entails increasing differences in incomes between those 'inside' and those 'outside'.

In order to better evaluate the effects on the eligibility of assistance in the framework of the Temple Scenario, we have created a proper 'catch up' scenario (See Figure below). We have assumed here that the 'above the EU15 average' growth rate is sustained at 2,5 % for the 10+2 countries, as well as for Croatia (i.e. 5% a year if growth is 2,5 % a year in the EU15). This 'above' 2,5% might be even little higher, although this would not change the substance of the results. In any case, in the framework of this 'catch up' simulation, at least 1% (of the total 2,5 %) is due to the Cohesion policy. We have also taken into account the fact that SF / Cohesion Fund aid will be allocated to the three EU15 Cohesion countries (Spain, Greece, Portugal) for some time after 2005.

GDP growth of the neighbouring states (i.e. those remaining outside the EU during this period, such as Turkey, the remaining Western Balkans' states, the EEA/EFTA states, Moldova and the Ukraine etc) will be lower than that of the 10+2 new Member States, i.e. 'above 1,5 %' of the EU15 average (compared to the 'above 2,5 %' for the 10+2 Member States). The EEA/EFTA states growth rates are assumed to equal those of the EU15 countries.

In the Graph below we present the time moments in which the GDP of the EU15, the three EU15 Cohesion countries, Turkey and each of the Western Balkans' states⁸ will reach 60%, 75% and 90% of the EU25 per capita GDP.

⁸ Again assuming here that Serbia and Montenegro stay together, and that Kosovo remains part of Serbia.

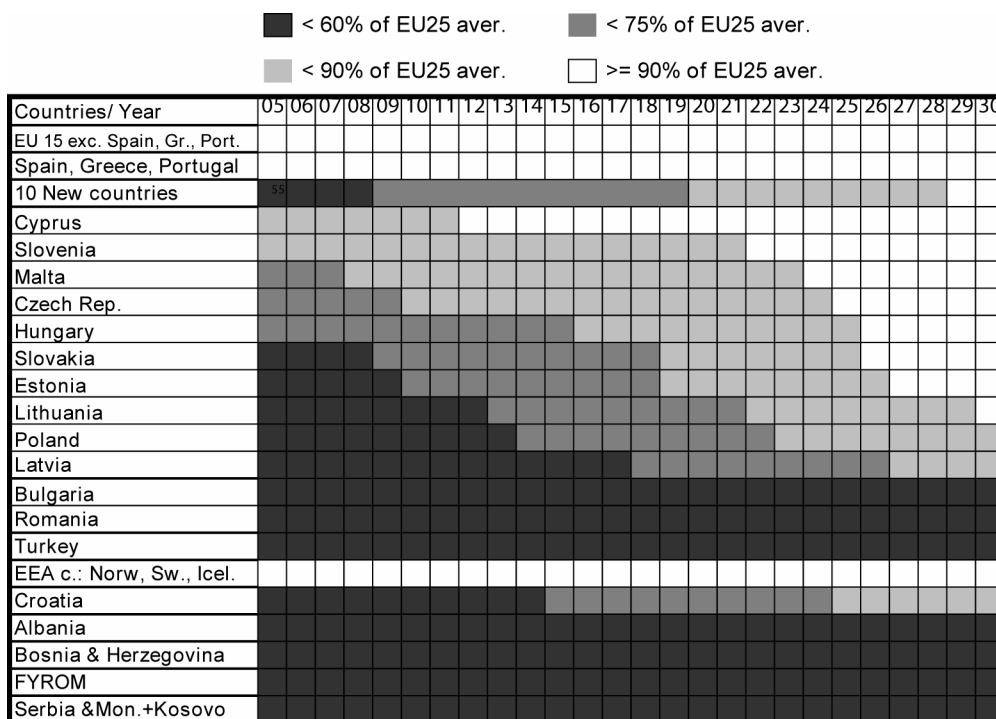


Figure 33 Scenario 2 – Simulation of GDP per head (PPS) in the EU27 + PAC countries 2005-2030

See for the assumptions in the text
 See for the sources of data in Table 21 notes.

Final image – Impacts on territorial cohesion

On the basis of the data we conclude the following. That the average *per capita* GDP of the 10 new (2004) Member States will reach 60 % of the EU25 average in 2008, 75 % of the same average in 2019 and 90 % in 2028. Although, in the middle of the period 2005-2030 the GDP of half of the 10 new countries will have exceeded 60% but not 75 % of the EU25 average. The *per capita* GDP of Bulgaria and Romania will not have reached the EU25 average by 2030, while the GDP of Croatia will reach this level by 2014. Moreover, in spite of the fact that the ‘catch up’ rates are quicker in comparison with the Market Scenario, the GDP of an important part of the EU population will remain under 75 % of the EU25 average in 2030. As such, the pressure for change (i.e. the further strengthening or weakening of EU structural policies) will be considerable.

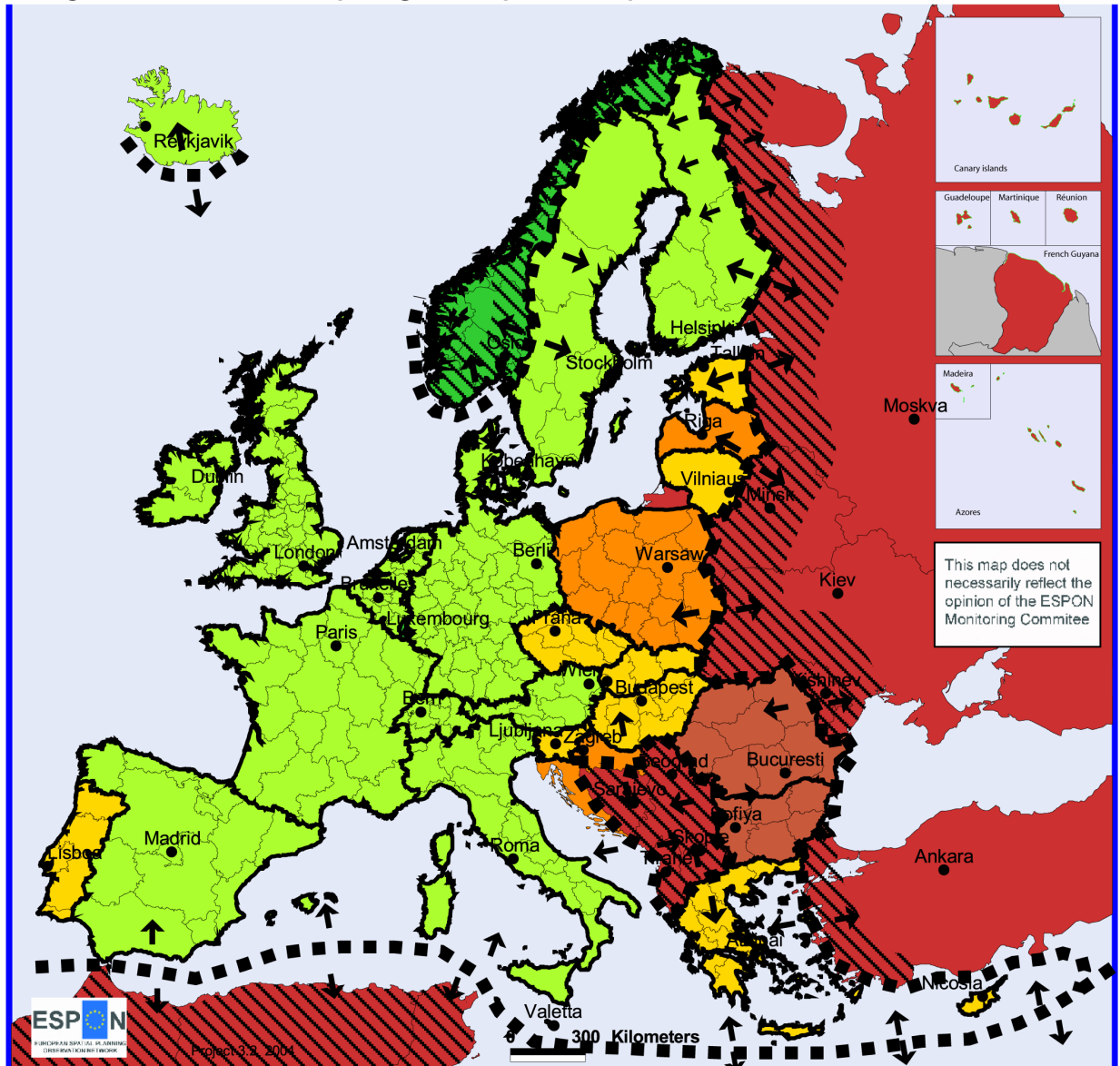
Finally, the *per capita* GDP of both Turkey and the Western Balkans’, as well as that of the other neighbouring countries will be very low. Moreover this difference between all of these states and the EU27 average will further increase over the period 2005-2030.

GDP inequalities *among the regions* of the EU27 (+1) will be rather less than in the case of the Market Scenario, although they will remain significant even during the period 2015-2030. Turkey’s eastern regions together with some regions of the Western Balkans will have the lowest *per capita* GDP in the EU36. We will further specify the effects on disparities among the regions using the above simulation in next phase of the project.

The final image of the disparities in terms of *per capita* GDP for the EU and the neighbouring countries in this Scenario is shown in the Figure below. The corresponding values have been calculated on the basis of the above simulation. We have attempted in this Map to illustrate the two main aspects of the Temple Scenario, namely, the strengthening of the ‘barrier’

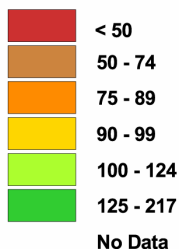
between the EU and the neighbouring countries and the increase in the level of cohesion across national territories in the EU.

Enlargement Scenario 2: "Deepening: / "Europe as a temple"



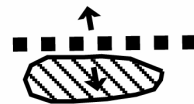
Final image:
Strong EU integration

Simulation for 2030
GDP per head PPS
Index, EU25=100



Basic options

- EU25 + Bulgaria, Romania, Croatia
- No further enlargement
- Strong barrier between EU / non EU
- European Neighb. Policy: (ENP): Low level "Pre-accession aid"



- Strong EU Cohesion Policy:
- > Growth is maintained in EU28 Cohesion countries at 2,5 % a year above the EU15 average

Europeographic Association for the administrative boundaries
Origin of data: Eurostat

Figure 34 Enlargement Scenario 2: 'Deepening:/'Europe as a temple'

2.6.2.6 Summary (1st draft of conclusions)

The scenarios outlined above have sought to tell two interrelated and plausible 'stories' about the development of the Union between 2005 and 2030 through the prism of the deepening/widening dichotomy, where we have attempted to distil the essence of each 'possible future' in such a way that a weaving path of developments and historic 'break points' could be 'reconstructed.'

At a general level, looking at both scenarios together, the differences emerged – both between the scenarios themselves and between each and the baseline scenario outlined previously – in a number of areas.

- (1) Constitutional ratification
- (2) Policy re-nationalisation
- (3) Turkish accession
- (4) ENP success
- (5) Institutional arrangements

In the first four, significant bifurcation took place across the scenarios, while in the fifth, each scenario saw a move towards *variable geometry* in some form or other. The basic hypotheses of each scenario related to the EU's attempt to deal with the problems of globalisation, its answer to which generally drove the logic of the scenario in terms of the enlargement question.

In the 'market' scenario – given the stated assumptions about the development of the global economy, and with the Lisbon goals as its cornerstone – the implications of choosing widening over deepening were played out, where the EU Constitution was not ratified, a significant dose of policy re-nationalisation took place, Turkey gained entry to the Union, and the ENP was a qualified success (qualified only because it did not stop a number of countries from applying for membership). The EU became ever more integrated into the new global economy, struggling hard to remain at the top table. The 'losers' in this scenario were undoubtedly the environment and social cohesion at the national level, though these were now seen as issues that inevitably had to be addressed.

In the 'temple' scenario – given the stated assumptions about the development of the global economy, and with the Gothenburg goals as its cornerstone – the implications of choosing deepening over widening were played out, where the EU Constitution was ratified, a significant level of policy re-nationalisation ultimately did not take place, Turkey was not admitted, and the ENP effectively failed – both in terms of what the EU wanted from it, and as regards the level of expectations placed on it by its potential recipients. The EU prospered economically after its strategic decision to focus on the 'clean' high technology path, but this saw it become increasingly 'detached' from its neighbours as ongoing deepening further increased the divide between 'inside' and 'outside.' The losers here then were the EU's neighbours. Moreover, this was eventually seen to be an untenable position, and it was recognised that some new bargain with those on the outside was needed.

In both scenarios then we see a sharp initial divergence – over Constitutional ratification – followed by the playing out of scenarios' inner logic in terms of their pre-defined outcomes. In each scenario however the consequences of choosing to diverge from the historical path by privileging one or other of the major choices eventually leads to a point where the

realisation of the need for 'balance' occurs, and the issues that that particular scenario previously ignored are then promoted as 'fundamental to the future'.

Behind the 'epiphenomena of mere events' however we can still see the traces of the fundamental forces at work, but as explained in section 2 above, the *driving forces* identified in the scenario base document are only rarely directly discernable. Instead they are, more often than not, indirectly played out within the context of the events portrayed within the scenarios.

As such, each scenario illustrates the importance of the political choices made by the various actors involved, i.e. the Commission, the current Member States, and neighbours/'prospective' members. Here a clear hierarchy is maintained in each scenario, with Member States' interests clearly predominating.

Similarly, the economic and political imperatives of integration and enlargement remain robust across both scenarios in an attempt to avoid slipping into the pitfalls of *determinism* of either stripe. Integration, and by extension, enlargement have as their means an economic imperative, though the goals ultimately remain political.

2.6.2.7 Annexes

Annex 1

Some methodological aspects of the simulations we have used

In addition to the notes in Annex 1 of the baseline scenarios, we should stress that in the simulations we have produced for the prospective policy scenarios, future changes of the per country population have not been taken into account. We have made the assumption that population change rate is the same for all the EU + PAC countries during the period 2005-2030. In future improvements of these simulations we would take into account forecasts for the future evolution of the per country population provided by other scenarios of this project or by other sources. However, the substance of the results of the simulations will not change significantly. We remind that the use of the simulations is limited to support arguments concerning the catching up process and the effects on the eligibility for assistance.

2.7 Rural development

2.7.1 Scenario base

2.7.1.1 Sources of information

As sources of information for the scenario base and the scenarios we have first of all used the results of other ESPON projects. Besides, we have also used additional sources in order to complete the information needed for the scenario base and the scenarios. This section presents the most important sources. The bibliography provides a complete overview.

- AIRDR et al. (2004) ESPON project 2.1.3 The Territorial Impact of CAP and Rural Development Policy. ESPON, Luxembourg.
- CURS et. al. (2004) ESPON project 1.1.2 Urban-Rural Relations in Europe. ESPON, Luxembourg.
- DG Agriculture (2002) European Agriculture entering the 21st Century. European Commission, Brussels.
- DG Agriculture (2003) Reform of the Common Agricultural Policy. European Commission, Brussels
- DG Agriculture (2004) Prospects for Agricultural Markets 2004-2011 Update for EU-25. European Commission, Brussels
- Eurostat (2003) Structure of agricultural holdings in the EU. Statistics in Focus, Agriculture and Fisheries, N° 02/2003, Luxembourg.
- IPCC (2001) Third Assessment Report on Climate Change. http://www.grida.no/climate/ipcc_tar
- IPTS (2002) Scenarios for co-existence of genetically modified, conventional and organic crops in European agriculture, http://www.jrc.es/projects/co_existence/Docs/coexreportipts.pdf
- Nordregio et al. (2004) ESPON project 2.2.1 The Territorial Effects of the Structural Funds. ESPON. Luxembourg.
- Pater, B. de et al. eds. (2004) Europa. Van Gorcum, Assen.
- Ravesteyn, N.R. van & D. Evers (2004) Unseen Europe. NAI Publishers, Rotterdam.
- Robert et al. (2001) Spatial impacts of Community Policies and Costs of Non-coordination. AETS, Strasbourg.

2.7.1.2 State and evolution of agriculture and rural areas

In terms of land-use, agriculture occupies by far the largest part of rural areas in Europe. In terms of economic functions, however, the role of agriculture has significantly declined over the past decades. At the same time a number of other economic functions have emerged and developed in the rural areas, like industrial, residential, tourist, recreation and leisure functions. Urban-rural relations have also strongly developed in a number of European regions. The result is that rural areas have undergone a process of economic and social

diversification and that various categories of rural areas can be identified according to the respective importance of the various economic components.

2.7.1.2.1 State and evolution of agriculture in Europe

Challenge of agricultural structural change

Over the past decades, agriculture has experienced substantial structural changes. This process is still going on and will probably continue in the decades to come. Agricultural change is linked to the agricultural markets. Cost-intensive technological progress (machines, fertilizers, herbicides and fungicides) leads to higher productivity and thereby to higher agricultural production. The increased production causes a rising supply on the markets. The increased supply, together with the competition with cheaper production forms from abroad, causes in turn a spill-over and consequently a decline of farmers' revenues and incomes. In this way a vicious circle is started and continued.

The main indicators for structural change in agriculture are: number of farms, farm size, employees in primary sector, and age of farmers. Data about these indicators are presented below¹. Other indicators that may be considered are: main or additional income from agriculture, products and production forms, and degree of mechanization. Data about these indicators were not found yet. After the publication of the *Second Interim Report* the search for these data will be continued.

Number of farms and farm-size

In 1995, there were 7.37 million agricultural holdings in the EU-15. This number dropped to 6.77 million in 2000. Still, the small farms (0-5 ha) dominated with 3.9 million in 2000. Only 603,000 farms are larger than 50 ha. From 1997 until 2000 the decrease in farm holdings was highest in Germany (-4.8%), Finland (-4.6%), Denmark (-3.5%) and Belgium (-3.3%). In this period, only in Spain the number of holdings increased (+2.6%). This was caused by a sharp rise in small farm sizes (0-5 ha).

Farming in the Central and East European Countries (CEECs) is characterised by the large number of farms (9.2 million), 30% more than in the EU-15. On the other hand, the land they cultivate amounts to 50 million ha, less than 40% of that of the EU-15. This indicates a considerable potential due to the agricultural land cultivated and the number of operating farms. The group with the smallest holdings by size of land cultivated (below 5 ha) dominates in number, (82%) but not with regard to the share of used farmland (27%). The majority of them should be classified as subsistence or part-time farms, which don't provide sufficient income for the farm household. Off-farm activities or social payments are required to generate additional income. In the long run these holdings are probably unable to survive. Farms with a few hectares but specialising in the production of pigs, poultry, fruits or vegetables, however, may be profitable.

Concerning farm sizes a distinction should be made between the physical and the economic size. In 2000, the average area of an agricultural holding in the EU-15 has been 18.7 ha. The difference between the Member States, however, is remarkable. The biggest average farm sizes were found in the UK (67.7 ha), Denmark (45.7 ha), and Luxemburg (45.3 ha), the smallest in Greece (4.4 ha) and Italy (6.1 ha).

¹ Data presented in this section are derived from Eurostat (2003a; 2003b).

The European Size Unit (ESU) is a measure for the economic size of a holding. It corresponds to the sum of the Standard Gross Margins (SGM) of the holding. 1 ESU is equal to EUR 1,200 of standard gross margin. From 1989/90 to 1997 the SGM in the EU-15 rose in all Member States, most of all in the Netherlands, Belgium and Denmark. In 1997, the average SGM per holding was highest in the Benelux, the United Kingdom, France, and Germany. The Figure below provides an overview of the physical and economic size of farms in the EU-15.

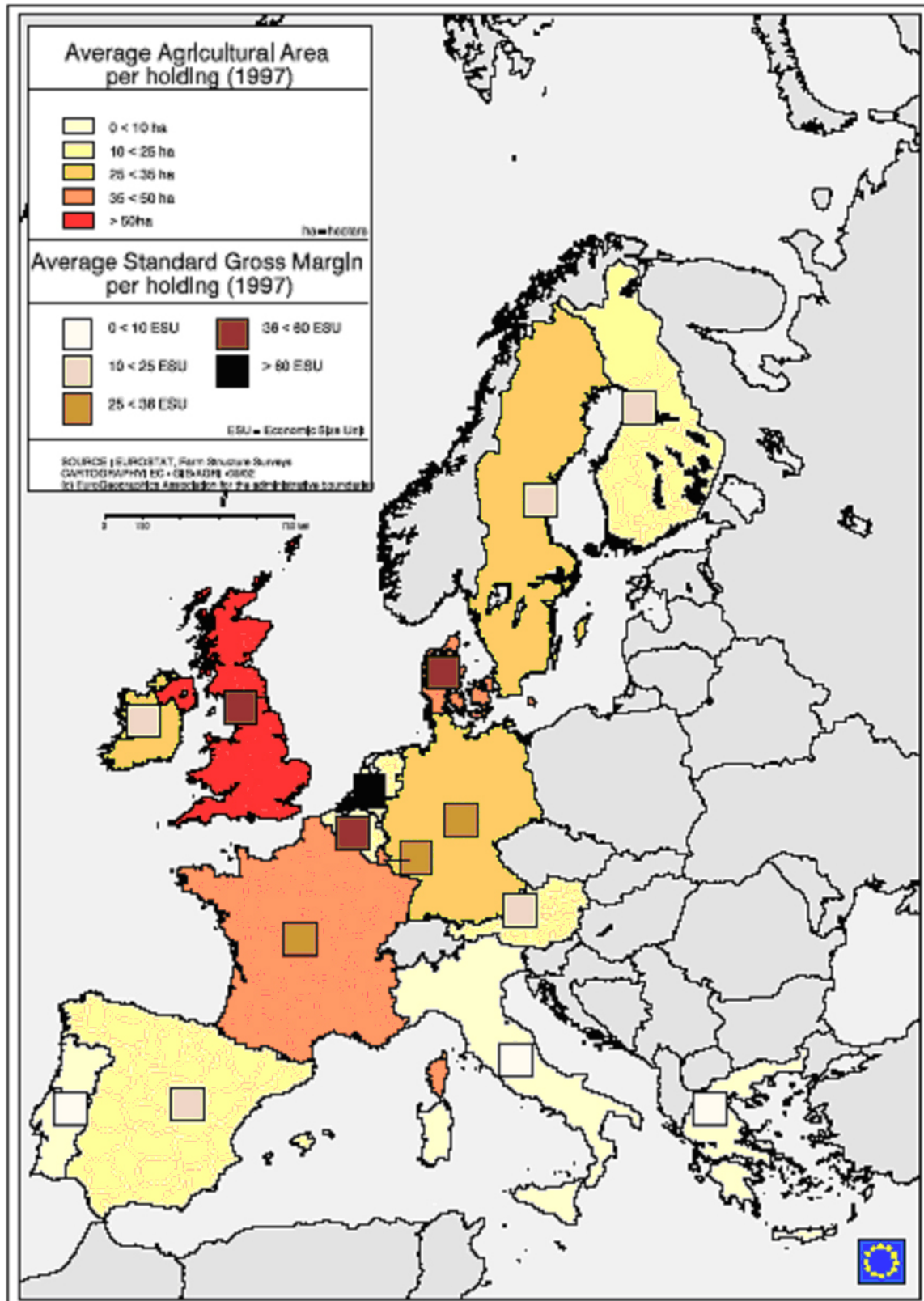


Figure 35 Average agricultural area and average standard gross margin per holding in the EU-15 (DG-Agriculture, 2002).

In the CEECs, farms of medium size (5 to 20 ha) cultivate the same share of land as those belonging to the group with the smallest size (IAMO, 2004). However, in terms of number, the former is 5 times smaller than the latter. These farms, with an average size of 9 ha, have a potential both to earn a substantial part of the farm family income from agricultural production and to grow in the future so as to remain economically viable. Farms belonging to the cluster of 20 – 50 ha may have a better chance of being fully commercially-oriented, while the cluster above 50 ha includes mainly large-scale commercial companies and co-operatives.

Regarding long-term survival, the chance is higher for those holdings, which are currently endowed with sufficient land and/or capital on which an expansion may be based. This is likely the case with farms cultivating 20 ha or more. Nevertheless, smaller enterprises may also have a future. In any case, substantial structural adjustments are required in most of the CEECs to let farmers' incomes grow to a similar extent as the incomes of the non-farming population.

The share of small holdings (< 5 ha) in the total number of farms is high in all countries. It ranges from 42% in Latvia to 97% in Bulgaria. Although the kind of privatisation influenced the structure of agriculture at the beginning of transition, in the following years factors like profitability and opportunities for off-farm jobs determined it too. In Bulgaria (97%), Hungary (94%) and Romania (93%) many persons who lost their jobs in industry or the service sector started to farm the small lands they were given during the privatisation. Patterns in land-use by different farm groups vary. In five of the CEECs the farms exceeding 50 ha cultivate more than 50% of total agricultural land. In the Czech Republic (92%) and in Slovakia (94%), this share is the highest. It is the lowest in Slovenia (8%), Lithuania (10%) and Romania (18%).

Farm types

Van Eck et al. (2002) distinguish four different development patterns of farm types (compare also Smeets, 2002). *Large-scale agriculture* contains arable and diary farming. These farm types can be found for instance in North and Central France, the coastal zones of East Brittany, the Netherlands, in the South of Europe and also in the Central and East European countries (former state-owned farms). Concentration and scaling-up of production are processes which took, take and will take place as long as there are opportunities for farmers to use their production means (land, labour, buildings) in a more efficient way. The process is stimulated by the liberalisation of the markets and by the reforms of the subsidies for diary production as proposed in *Agenda 2000* (De Bont et al., 1999). This forces many relatively small and less efficient farmers to step over to another farm type or to quit agricultural production.

Agro-production parks contain intensive cattle farming and horticulture, including hothouses. These farm types dominate in urbanised regions in the Pentagon and near capitals and other large cities. In these areas intensive farming profits from the highly developed infrastructure (roads, harbours, airports) which enables them to efficiently produce for the EU internal market and the world market. At the same time urbanisation, high land-prices and environmental protection put more extensive forms of agriculture under pressure in these areas. Agro-production parks occur where intensive cattle farming, horticulture or both cluster together with for instance central slaughterhouses and manure proceeding installations. This provides opportunities to further enhance efficiency by reducing transport, combine energy management etc.

Experience farming refers to the feelings of rest, space, health and nature that people link to agriculture. This farm type is found in urbanised regions but also in areas with attractive small-scale landscapes in for instance the West of France, Flanders, the East of the

Netherlands, the Northwest of Germany, and Central Denmark. An increasing number of farmers capitalize these feelings by selling regional products like wine, honey, and cheese at the farm and by providing services like camp-sites, training facilities or day-care for mentally handicapped. They create an added value by providing a 'natural' environment, contacts with animals etc. In recent years this farm type has been stimulated by the so-called experience economy: the increasing willingness of consumers to pay for special experiences. Experience farming has recently professionalized in terms of service-provision, organisation of production chains and marketing.

Agrarian nature and landscape management also characterizes areas with attractive small scale landscapes. It builds on the idea that agriculture is an important bearer of cultural landscapes. In society there is a growing demand for the conservation of cultural landscapes and the natural values (flora, fauna) related to them. At the same time, however, there is a widening gap between agrarian practice required for the maintenance of these landscapes and efficient agricultural production. Therefore, governments on the EU, national, regional and local level have taken various measures in order to bridge this gap. On the EU level Rural Development Policy plays an important role by stimulating agri-environmental farming, farm forestry etc. (see section 2.7.1.3.3). Co-operation among farmers enables them to create larger networks of cultural landscapes and to manage and market (agritourism) them in a professional way.

Employees in primary sector and age of farmers

From 1999 until 2002 the rate of employees working in the primary sector in the EU-15 continued to decrease from 4.5% to 4.0%, which means that 6.5 million people were working as farmers. Within the Central and East European countries, 13.4% were employees in the primary sector, which means another 3.9 million persons.

In the CEECs, agricultural employment in rural areas is higher than in the national average. Besides, the importance of the service sector is lower than in the national average. Rural areas in the Czech Republic, Hungary, Slovakia, Poland and Estonia are relatively highly industrialized. In the Czech Republic, Hungary, and Slovakia the agricultural sector employs up to 7% in the national average and less than 14% in rural areas. Agriculture is, however, much more important or even the main employment sector in Bulgaria (26%) and the rural areas of Romania (74%), Lithuania (51%), Poland (35%), Slovenia (25%) and Estonia (23%).

In the CEECs, agriculture is more important in terms of employment opportunities than in the EU-15. However, there are huge differences across the countries and the regions. In most regions, the share of agricultural employees in total employment is significantly higher than the share of agriculture in gross value added, which indicates low labour productivity relative to the other sectors. This pattern is also observed in the EU-15, but at a lower level.

In some of the CEECs, agriculture plays an important role as a social buffer stock for labour. This is manifested particularly by the existence of the many small-scale, subsistence-oriented farms. In 2001, the official (registered) unemployment rates in the CEECs ranged between 1.6% and 43%. The question is, however, to what extent these differences are determined by different degrees of hidden unemployment and its correct statistical measurement.

In 2000, 52% of individual farmers in the EU-15 were aged over 55 and 29% over 65. Young farmers under 35 made up only 8% of the total. The proportion of farmers aged over 55 was highest (60%) in holdings with mixed crops and those with specialist permanent crops (vines, olive groves, orchards etc.). Since these crops are mainly concentrated in the southern regions of the EU, it is not surprising that the proportion of farmers aged over 55 was highest in Portugal (65%), Italy (62%), Greece (56%) and Spain (53%).

The lowest proportion of farmers aged over 55 was recorded in Finland (25%), followed by Germany (28%) and Austria (29%). It was also in Germany and Austria that the highest proportion of farmers aged under 35 was recorded (16% each). On average the size of holdings measured in terms of Utilised Agricultural Areas (UAA) was greatest in the 35 to 44 age group. The area of holdings then decreased with age: a farmer aged over 55 farmed on average half the number of ha than for a farmer younger than 45.

In the CEECs, despite higher age dependency ratios and death rates in rural areas, the statement that individual farmers tend in general to be over-aged cannot be confirmed. In many of these countries, approximately 25% of the agricultural labour force is younger than 35. Estonia (23%) and Poland (21%) also show high shares of the agricultural labour force older than 65, whereas this is marginal in Slovakia (0.3%), the Czech Republic (2%) and Hungary (2.5%).

Dualism in the systems of agricultural production²

The development of the territorial aspects of agriculture in Europe during the last two decades reveals some major trends. Among the 129 million ha of agricultural land in the EU-15, more than half were occupied in 1995 by arable land and more than one third were covered with surfaces still in grass (STH). Less than 10% was devoted to permanent crops (vine, orchards, olive groves) strongly concentrated in certain regions.

Between 1975 and 1990, there was an important change in agricultural holdings. The traditional agricultural holdings with mixed farming and livestock farming moved back to the benefit of specialised holdings, facing the consolidation of the large agricultural basins. An important share of UAA devoted to self-supply (animal feed, seeds) or to auto-consumption (human consumption) was released and reoriented towards the production of crops intended to be sold outside the holding: cereals (common wheat, grain-maize), industrial crops (colza, sunflower, soy etc.) or dry vegetables (in particular protein peas). The sale crops increased from 32.2 million ha in 1975 to 37.3 million ha in 1990, i.e. an increase of 16%.

In most countries, the UAA regressed slightly between 1975 and 1995, but two phases must be distinguished in this evolution. From 1975 to 1989, agricultural surfaces decreased in the totality of regions. This fall was particularly important in a number of Italian regions (Piedmont, Lombardy, Emilia Romagna, Umbria, Calabria and Sardinia) but also in Hesse.

Between 1989 and 1997, however, the UAA increased up to 129 million ha, in particular in Brittany, in a major part of Spain, in the East of England and in the north of Italy. This rise, which took place rather in the regions of major crops, should be put in relation to the reform of the CAP in 1992 and to the obligation of land set aside. In the traditional livestock-farming areas, it continued falling.

During these twenty years, European agriculture seems to have developed on the most productive land while leaving certain less-favoured areas (mountain areas, foothills) or areas traditionally dedicated to livestock-farming. It also gave up to the urban extension a part of its surfaces, among which high quality arable land. In the period from 1997 to 2000, however, the UAA of EU-15 declined again by 0.6%. Regarding agricultural production the following tendencies were observed.

² This chapter is drawn from Robert et al. (2001).

Major crops

Altogether, the production of major crops continued growing in Europe. Community support to cereals, oilseeds and protein seeds as well as the fall of the number of herbivorous animals induced an increase in the crops for sale to the detriment of surfaces still in grass and of other fodder (meadows and coarse grains). The CAP reform in 1992 only modestly affected these major trends. It represented an important, but insufficient step towards taking environmental aspects connected with agricultural production into account. On the EU level agricultural production was significantly lower in 2003 owing to exceptional weather conditions. Total production of cereals dropped from 263 million tons in 2002 to 229 million tons in 2003. Under normal weather conditions and with a lower set-aside rate of 5% the cereal harvest should reach 264.5 million tons in 2004. About 53 million tons would be produced in the new Member States compared to 212 million tons in the EU-15.

In the 1970s, the developments in farming technologies and the increase in plant health protection, in a context of guaranteed prices and of insufficient cereal production in Europe, made it possible to increase cereal production quickly (primarily in the plain areas). But the surpluses accumulated in the 1980s caused a regular price fall and therefore a lower gross product per hectare as from 1984. The coarse grains (barley, oats, rye etc.) were then forsaken to the benefit of common wheat and maize, owing to their higher yields and prices. At the beginning of the 1980s, dry vegetables (protein seeds) and industrial crops (colza, sunflower, and soy) offered gross products per hectare comparable or higher than those of the cereals. An effective support system allowed the rapid expansion of these crops in all Member States. Thus, the production of sunflower, protein pea and colza made considerable progress. Starting from a few thousand ha, they covered 4.8 million ha in 1990. The plains with major crops were conquered in a spectacular way.

With regard to the fodder crops, the predominance of fodder-maize in the feeding of herbivores was another characteristic fact of the 1980s. Owing to this development, fodder-maize was submitted to a redistribution of its surfaces. It forsook the traditional grain production areas in southern Europe and stretched towards major livestock-farming areas of the northern part. This development of maize also contributed to the retreat of meadow surfaces. Fodder-maize strongly developed in the cattle-rearing areas. The grain-maize remained an important sale cereal in the other producing regions. It remained in numerous regions the main cereal, because it develops better in warm climate and with irrigation.

Numerous natural or permanent meadows were replaced by artificial (made up of legumes) or temporary meadows, the yield of which per hectare was often higher. Traditional crops tended to concentrate in certain regions corresponding to the best pedo-climatic conditions. New crops, including fodder-maize, developed on the contrary even beyond the areas endowed with the best natural or agronomic conditions: displacement of the production of sunflower, soy, maize, and alfalfa to the north of the 45th parallel, concentration of colza in the continental areas.

This development sometimes led to excesses. Certain crops were cultivated almost in monoculture, succeeding one another from year to year. It is also the case for fodder-maize in certain livestock-farming or for wheat in the cereal basins. There is a general trend towards increasing the size of plots in areas of major crops and, locally, to the pulling up of hedges and of insulated trees in order to facilitate the use of more and more powerful agricultural machinery. These changes had serious negative impacts on biodiversity, on the quality of soils (compression, erosion), water and element flows (drainage, infiltration, streaming, wind etc.), and on landscapes (see section 2.7.1.4).

Permanent crops

Permanent crops also decreased. The pulling up of vines intended for ordinary wine production was the main reason for this reduction of surfaces between 1980 and 1995 (0.4 million ha). This results partly from Community support for pulling up. Wine production was concentrated on the name areas (quality wine), with a reorientation towards wines of better quality. A part of the plots of torn off vines with a low agronomic potential probably returned to a waste land state.

The evolution of orchard surfaces was characterised by a high concentration (reduction) of surfaces in the northern Member States and by the maintenance of surfaces in the southern Member States.

Surfaces with olive-trees increased altogether over the period. Greece and Italy increased their plantations while those of Portugal remained stable and those of France decreased by half. In Spain, expansion of plantations was recorded only as from 1995.

Surfaces still in grass

Between 1975 and 1995, surfaces still in grass (STH) decreased by 12% in EU-9. More than 4 million ha of permanent meadows were turned over. France alone lost 2.4 million ha. The cattle and sheep rearing areas in plains were the most affected. Between 1975 and 1990, the fall was higher than 5% in the West of France, in the South-West of the Netherlands, in a major part of Italy, in Flanders and in Hesse. The reduction in the STH was less sharp after 1990.

In the 1975-1995 period, only some cattle-rearing areas (Ireland, Limousin, Umbria) saw their STH increasing and, after 1990, the STH increased by more than 2% a year in particular in Denmark and in some regions of Italy, Spain and Portugal. The period marked by the milk quotas (1984) and the resulting decline of livestock-farming activities released surfaces suitable for ploughing. Fodder crops were intensified. During the same period, arable land increased by 12% in EU-9.

Woodlands

Woodlands, which covered approximately 32% of the European territory in 1997, are very unequally distributed within the EU and correspond to very different situations (forests, maquis etc.). In a general way, woodlands are in slight increase, partly owing to the European measures for the afforestation of land (afforestation of half a million ha from 1992 to 2001). In Ireland, 60, 000 ha of UAA were afforested (+ 16% of all the woodlands of the country). The fire-prevention in southern Europe also encouraged this increase. Lastly, arable land abandonment can lead to waste land and then to natural afforestation.

Irrigation

The development of irrigation can be regarded as an indicator of the intensification in agricultural production. The statistical data published by FAO shows a clear rising trend of irrigable surfaces in Europe, even if this tendency slowed down appreciably in recent years. In the EU-15, the increase in irrigable surfaces was +152,000 ha/year between 1961 and 1980, +146,000 ha/year between 1980 and 1996 and +123,000 ha/year in the 1990s. Thus, the irrigable surfaces doubled between 1961 and 1996, from 6.5 to 11.6 million hectares. Tendencies, however, differ substantially among the Member States:

- The sharpest increase is noted in France (irrigable surfaces multiplied by 4.5 from 1961 to 1996), with acceleration of the movement, contrary to the general tendencies of the EU. The record returns to the Poitou-Charentes region where the irrigated surfaces were multiplied by 10 from 1961 to 1996.
- In Greece, the increase in irrigable surfaces has been regular since 1961 at annual rates of +28,000 ha/year.

- In Italy, a statistically significant increase in irrigable surfaces could be demonstrated only for the period 1980-96 (+ 25,000 ha/year).
- In Portugal, the annual increase in irrigable surfaces was limited and remains lower than 1,000 ha/year.
- The increase in irrigable surfaces has been important in Spain until 1980, but was reduced distinctly since. All in all, irrigable surfaces in Spain increased by 80% over the period 1961-1996.
- For the other Member States, the tendency was clearly towards an important increase in the 1960s and 1970s (+41,000 ha/year). It has been reduced since 1980 to + 12,000 ha/year. Irrigable surfaces have remained stationary since 1990. Nevertheless, the proportion of irrigable surfaces in certain countries of Northern Europe is far from being negligible. It reaches for example 29% of the UAA in the Netherlands.

Maize was the main irrigated culture in terms of surface, but other annual or permanent crops were irrigated in order to regularise or increase the yields. This recourse to irrigation often involved an increase in inputs (fertilisation, plant health protection) and caused a loss of nutrients or of pesticides in the environment.

2.7.1.2.2 Typology and diversification of rural areas in Europe

There are different meanings of 'rural areas'. Rurality may be very different in different areas, at different times and for different people. The search for some kind of 'essence' of the rural should therefore be avoided (CURS et al., 2004). The rural shouldn't be seen as an opponent to the urban either. For the rural and the urban are interdependent in many ways. They are connected physically, economically, socially, and politically through issues such as housing, employment, education, transport, tourism and recourse-use. The rural and the urban should therefore be considered as two components of one system. Any clear-cut distinction between both components seems arbitrary.

Typology of rural areas

In the policy document *Europe 2000+* (1994) the European Commission (EC) presents a typology distinguishing five different categories of rural areas. These categories still seem to be valid.

Rural areas in urbanized regions

These rural areas are situated in the periphery of important agglomerations, especially in the Pentagon and near the capitals and other large cities. They profit from the presence of residential areas, industrial estates, and recreational amenities. Therefore, socioeconomic viability is relatively high. At the same time many of these rural areas are affected by high socioeconomic dynamics in terms of population density and urbanisation. Most agriculture in these areas is characterized by intensified and industrialised production, often causing serious pollution of the environment and damage to the landscape. Extensive agriculture is put under pressure because of urbanisation and high land prices.

Rural areas attractive for tourism

Many coastal areas near the Baltic, the North Sea, the Atlantic Ocean, and the Mediterranean have a well developed tourist infrastructure and can be characterized as rural areas attractive for tourism. The same is true for mountain areas in the Alps and the Pyrenees and to a lesser extent in the Tatra. Because of the incomes the tourist industry generates, socioeconomic viability in these areas is relatively high. The tourist industry also causes the in-migration of many young people from the surrounding areas, which may have a negative impact on the production structure of these areas. In high seasons tourism may

put nature, landscape and environment under pressure. The same is true for the further development of the tourist infrastructure.

Rural areas with a variety of activities

These rural areas are positioned somewhere between rural areas in urbanized regions and rural areas attractive for tourism. They are for instance situated in Devon in the United Kingdom, in regions in the Middle of France, in the Po area in Italy, in Bavaria in Germany, and in the Netherlands. The areas are highly dependent on rural activities but additional activities, like service for out-door recreation, manufacturing or local crafts, generate additional incomes. Socioeconomic viability is moderate. It is uncertain whether the diversified agriculture will survive or if the economic structure will change into a more diversified one. To some extent landscape elements are developed in these areas and farmlands renaturalised.

Rural areas where agriculture dominates

Rural areas where agriculture dominates are less diversified than the rural areas with a variety of activities. These areas are dominated by agriculture in terms of land-use and also in terms of economy. The agrarian rural areas contain two subcategories:

- Areas in which agriculture has a strong production structure and is highly productive and in which the processing industry plays an important role. These areas can be found in Brittany, Aquitaine, and Champagne in France and in England. Socioeconomic viability is moderate or high. The intensified and scaled-up agriculture puts environment and landscape under high pressure.
- Areas in which agriculture is traditional and has a weak production structure and a low productivity. These areas can be found in Galicia in Spain, in Poitou-Charentes in France, and in most of the CEECs. Socioeconomic viability is low. Environment and landscape are under low pressure.

Rural areas with low accessibility

Rural areas with low accessibility contain areas in the middle and high mountains, isolated plateaus, small islands, and peripheral areas, e.g. in the North of Scandinavia and in the East of the CEECs (the new EU-border areas). These areas are characterised by large scale natural landscapes and small scale cultural landscapes because they are dominated by forests and marginalised agriculture. The socioeconomic viability is low. The same is true for population density. Out-migration of younger people (searching for jobs) causes an ageing of the population. This is sometimes further enhanced by the in-migration of retired people.

Diversification of rural areas

The typology just described indicates that rural areas shouldn't be considered as homogenous. They shouldn't be considered as static either, for rural areas are affected by different but related trends. CURS et al. (2004) describe four main trends. The extent to which these trends affect the different types of rural areas varies significantly according to the physical characteristics of the area, the socioeconomic and political capital, etc.

Towards the post-productivist country-side

In developed market economies the socioeconomic changes seem to bring rural areas increasingly towards the post-productivist country-side. Some of the main changes associated with this shift include: the declining significance of agriculture in terms of employment; the growing importance of alternative farm activities and quality of food products; the increasing significance of employment in service industries, manufacturing and high-technology; the emergence of new users of rural areas (including out-door recreation, tourism, and nature conservation); the repopulation of rural areas, especially by retired people; and the increasing appreciation of the quality of the environment. In the

post-productivist countryside, rural areas are commodified by the valorisation of place-specific resources that can be marketed directly or used in the marketing of the territory. Especially rural areas with a variety of activities or with low agricultural productivity are subject to these changes but rural areas with low accessibility as well, since commodification can also concern the exploitation of rural marginality. The very reason why the areas are not urbanised (distant locations, high altitudes, non-arable land) can be turned into assets.

Changing role of agriculture and food-supply chains

In the central parts of urbanised Europe, the fertile land and long history of intensive urban-rural relations have kept rural areas in urban regions very agrarian in character. As part of the globalisation process however, the consumers of agricultural products are now found via wider production and marketing chains. In rural areas where agriculture dominates, the production and marketing chains are mainly the same as in central Europe since the relations with the nearby urban nodes are not the most important. The CAP has played an important role in the industrialisation of agriculture but the recent CAP reforms stimulate a shift from the prevailing agri-industrial towards the multi-functional model of food-supply chains. This could mean that agriculture, at least selectively, has been brought back to the regional economy. The shift is further stimulated by the recent animal diseases and food scandals which have put food quality, food security and animal welfare high on the societal and political agenda. As a result, more attention is paid now to the origins of food products and to the production methods applied. The success of the multi-functional model depends on the development of the markets and on the ability and willingness of the actors along the food supply chain to provide the demanded supply by accepted production methods.

Towards consumption of different ruralities and the search for rural idyll

Although some rural areas have strengthened their position as production sites, an even stronger trend is the change towards rural areas as arenas of consumption. Both the urbanites visiting the rural areas and the regular residents can be seen as consumers of the rural or various ruralities. The aspirations and expectations of the newcomers may pose an unprecedented challenge for the prevailing culture. This trend has been enhanced by the spectacular rise in mobility and leisure, the changes in agriculture, the shifts in public preferences, and the technological innovations during the last decades. Many rural areas have turned to tourism or out-door recreation now as an alternative development strategy. This is not only true for rural areas attractive for tourism but also for rural areas where agricultural productivity is low, with a variety of activities or with low accessibility. The commodification of local resources, like cultural and natural heritage, has helped to strengthen the economic base in large parts of rural Europe. However, exaggeration of tourism may also be detrimental. Mass tourism can even alienate the local population from their own territory.

Localities as resources of identity formation

The self-identification of a rural area can be considered as a key of spatial development. Development resources that are indigenous to a locality – combined with local participation of different actors – can provide for endogenous development. In order to serve their purpose, however, the constructed identities must fit the local needs and the extra-local opportunities of each rural area. Furthermore, the consciousness-raising of an area has two sides. It looks outwards to 'sell' the area to the extra-local and at the same time it gets itself mobilized internally. The trend of self-identification is stimulated by the globalisation of the economy. When the importance of relative position decreases as a determining factor for economic success, the meaning of the properties of places can increase. Locations may gain importance due to natural, cultural and other assets, especially in the areas where environments providing a good quality of life are especially sought after, e.g. rural areas attractive for tourism, with low agricultural productivity or with a variety of activities. From this perspective territorial development initiatives may be considered as *'attempts to*

reconstruct an identity, to enable the territory to become a vibrant, creative, successful entity' (Ray, 1999: 260).

2.7.1.3 Common Agricultural Policy and Rural Development Policy

2.7.1.3.1 1945 – 1975 Period

The Common Agricultural Policy (CAP) has its foundations in the *Treaty of Rome* (1957) establishing the EEC. With the food shortages during and after the Second World War still fresh in the collective memory, self-sufficiency was a prime objective of the fledgling Community. The common market, with its protected external borders, was established to counter the fluctuations in the availability and prices of food and to raise the level of production. The original objectives of the CAP were:

- increasing agricultural productivity
- ensuring a fair standard of living for farmers
- stabilising markets
- guaranteeing food security
- ensuring reasonable prices for consumers

In pursuing the *Treaty of Rome* objectives, the following principles were (and still are) commonly cited: *market unity* (abolition of internal barriers to trade, and the establishment of common standards for food safety, quality, labelling etc.), *community preference* (establishment of the European Community as a single customs union, with a common tariff applied), and *common funding* (the use of income from the EU's 'own resources' and expenditures via the European Agricultural Fund)³.

None of these principles carried obviously territorial characteristics. On the contrary they each implied an increased degree of common rather than differentiated treatment across the entire EU area, e.g. in terms of free flows of products (AIRDR, 2004). The most important measures for achieving the CAP objectives were:

- income support
- price support
- import restrictions
- export subsidies

The CAP was strongly supported by agricultural interest groups and the food industry, which were very influential at that time, and by the six original Member States. It was, however, a costly endeavour: in 1970, the CAP took up 88% of the total EEC budget (Ministerie van Buitenlandse Zaken, 2003).

2.7.1.3.2 1975 – 1992 Period

The CAP proved to be so successful that within 20 years Europe was able to produce more than enough food for its own population. The artificially high prices made large investments profitable and stimulated an up scaling of production. Productivity was further stimulated by reorganisation of small scale farms; payments for research, education, and information; and land-use planning. Agricultural production in the Member States had grown so much that exports were rising sharply and surpluses mounting (e.g. the 'butter mountain' and 'milk

³ These resources are mainly generated by VAT- and GNP-based tax revenue, but also by import and other agricultural levies.

lake'). The NSCG (1992) observed that, in time, the continuing rise in productivity could lead to 30% to 40% of European agricultural land being taken out of production because it would, in strict agricultural terms, become surplus to requirements.

The first initiative to introduce an explicitly territorial dimension into the CAP was the Council Directive on Less Favoured Areas (LFAs) in 1975. The directive provides a framework for payment of annual compensatory allowances to farmers in areas characterised by one or more of the following attributes: (1) permanent handicaps (altitude, climate, steep slopes), (2) undergoing depopulation or having very low densities of settlement, and (3) experiencing poor drainage, having inadequate infrastructures or needing support for rural tourism, crafts and other supplementary activities. Following the reform of 1988 the LFA scheme was incorporated as part of the Structural Funds (Objective 5a measures) (see section below).

It became increasingly clear that the growth in production in agriculture was achieved at the expense of the environment and natural and cultural heritage in the EEC and the distortion of the international markets. The intensification, concentration and specialisation of production generated as side effects, for instance, monotonous landscapes, the use of large natural areas, pollution of ground water (by increased use of pesticides and fertilisers), and reduction of biodiversity (EC, 1999). Environmental groups and third world groups, supported by the results of scientific research, objected frequently and intensively against the CAP.

The EU reacted in stages to these objections, first by raising prices and later by introducing production quota and environmental measures. In 1987 Milk quota were introduced in order to limit milk production. Besides, income subsidies were linked to measures, like set-aside (i.e. paying farmers for not cultivating some of their land), which were also designed to limit production. In the same year, the Single European Act mandated the consideration of environmental protection in the CAP. This led to the introduction of a number of agri-environmental measures and to a stronger (but still weak) element of environmental conditions in some other measures, e.g. stocking limits (AIRDR, 2004). This led to the specification of some new territorial aspects to the relevant CAP measures, mostly using the LFA boundaries.

In the beginning of the 1980s Regional Policy began in earnest. The *Treaty of Rome* had already outlined the Community objective of supporting the balanced and harmonious development of the economic activities of the Member States. But no specific instruments existed. In 1962 the European Agricultural Guidance and Guarantee Fund (EAGGF) was created but the fund didn't respond in those days to a clear strategy for regional development. In 1975 the European Regional Development Fund (ERDF) was set up. From 1980 onwards the funding was used to finance the first special, multi-annual schemes for (among other aims) the development of rural areas with few alternatives to agriculture. These schemes pioneered with integrated development programmes (Nordregio, 2004).

In 1988 a major reform of the Structural Funds was introduced in order to enhance the effectiveness of the use of Community resources. The budget was doubled and there was a shift from individual project support to a programme-based approach. Five priority objectives for regional development were defined to which a sixth was added later (see below). The following objectives were relevant for agriculture and rural areas:

- Objective 1: structural adjustments and development of less developed regions
- Objective 5a: speeding up the adjustment of agricultural and fisheries structures
- Objective 5b: facilitating development of rural areas

- Objective 6: promotion of development in regions with exceptionally low population density

Objective 5a was explicitly targeted at agriculture and continued long-standing funding of capital investment on and off farms by means of grants and loans. Rural areas with economic problems fell either into Objective 1, where more integrated development programming was attempted, or, with lower rates of support, into Objective 5b. The Community Initiatives LEADER, focusing on bottom-up projects for rural development, and INTERREG, focusing on cross-border, transnational and interregional cooperation, was applied in rural areas as well.

2.7.1.3.3 1992 – 2005 Period

The system of protected European markets was still in danger of collapsing under the weight of its own success and was becoming too expensive to maintain. The pressure for reform was intensified further by the respective GATT and WTO negotiations (Uruguay Round) as the negative consequences of the protectionist EU policy for other exporting countries and especially the developing countries became clearer. Table 23 provides an overview of the import tariffs on some agricultural products. In response to these trends, the EC began a shift in expenditure from production support to income support and rural development. The CAP continued in this vein, stepping up efforts to mitigate the negative side effects like overproduction, environmental damage and market distortion.

| Products | Import tariff (in %) |
|-------------------------------|----------------------|
| Grain | 156 |
| Other cereals | 134 |
| Sugar | 297 |
| Diary products | 289 |
| Beef | 125 |
| Pork | 52 |
| Poultry | 45 |
| Industrial products (average) | 4 |

Table 23 Overview of import tariffs on some agricultural products (Asbeek Brusse et al., 2002).

The MacSharry reform of 1992 was a milestone in this process. The reform changed the open end system into a system of controlled production with lower guaranteed prices for limited production volumes. It also decoupled agricultural payments from production levels and introduced the set-aside system. Part of the money which became available was spent on the growing Structural Funds (see below). Commissioner Fischler further decoupled agricultural payments from production levels and at the same time coupled the payments more to animal welfare, environmental protection, and landscape care. Another milestone in the reform of the CAP was *Agenda 2000* (EC, 1999). In this reform the 'European model of agriculture' was endorsed. The most important objectives were:

- more market orientation and greater competitiveness
- food safety and quality

- stabilised farmers' incomes
- integration of environmental concerns into agricultural policy
- developing the vitality of rural areas

The following table provides an overview of the CAP expenditures in million euros in the year 2001. The table also differentiates expenditure to the Member States.

Table 2.1: CAP expenditures by Member State, 2001 (million Euro)

| | B | DK | D | EL | E | F | IRL | I | L | NL | A | P | FIN | S | UK | Total* |
|-------------------------|-----|------|------|------|------|------|------|------|----|------|------|-----|-----|-----|------|--------|
| Arable Crops | 166 | 666 | 3739 | 483 | 1934 | 5181 | 120 | 1919 | 11 | 251 | 379 | 242 | 353 | 420 | 1603 | 17466 |
| Sugar | 281 | 86 | 237 | 8 | 62 | 357 | 4 | 143 | | 50 | 28 | 21 | 10 | 23 | 187 | 1497 |
| Olive Oil | | | | 587 | 1030 | 5 | | 848 | | | | 54 | | | | 2524 |
| Dried Fodder etc. | | 10 | 23 | 5 | 186 | 83 | | 48 | | 14 | | 1 | | | 4 | 375 |
| Textile Plants | 9 | | 2 | 543 | 212 | 42 | | | | 4 | 1 | 3 | | | 9 | 826 |
| Fruit, Vegetables | 37 | 1 | 17 | 235 | 522 | 294 | 2 | 348 | | 40 | 2 | 42 | | 2 | 17 | 1558 |
| Wine Products | | | 41 | 16 | 470 | 222 | | 378 | | | 14 | 54 | | | 1 | 1197 |
| Tobacco | 3 | | 34 | 376 | 115 | 77 | | 339 | | | 1 | 19 | | | 9 | 973 |
| Other Crop Products | 3 | 32 | 18 | 24 | 52 | 26 | | 118 | | 10 | | 5 | 2 | 2 | 4 | 297 |
| Crop Products | 499 | 794 | 4111 | 2276 | 4584 | 6287 | 126 | 4144 | 11 | 368 | 425 | 441 | 365 | 448 | 1824 | 26713 |
| Milk and Milk Products | 181 | 128 | 186 | -3 | 29 | 500 | 144 | 92 | | 479 | -27 | -3 | 46 | 28 | 127 | 1907 |
| Bovine Meat | 169 | 83 | 744 | 61 | 734 | 1468 | 827 | 296 | 8 | 86 | 172 | 126 | 62 | 101 | 1116 | 6054 |
| Sheep and Goat Meat | 1 | 1 | 34 | 201 | 390 | 144 | 90 | 143 | | 12 | 4 | 48 | 1 | 3 | 374 | 1447 |
| Pig Meat, Eggs, Poultry | 5 | 26 | 5 | 1 | 11 | 52 | 1 | 8 | | 19 | 4 | 3 | | 1 | 2 | 137 |
| Fish | | | | | 6 | 3 | 1 | | | | | 1 | | | 1 | 13 |
| Livestock Products | 356 | 238 | 969 | 261 | 1171 | 2167 | 1063 | 539 | 8 | 597 | 153 | 175 | 109 | 134 | 1619 | 9559 |
| Non-Annex I Products | 40 | 33 | 65 | 3 | 23 | 53 | 51 | 19 | | 79 | 19 | 2 | 6 | 9 | 36 | 436 |
| Food Programmes | 8 | 2 | 17 | 15 | 63 | 65 | 2 | 49 | | 2 | 1 | 28 | 7 | 9 | 12 | 282 |
| Ultra-Periphery Progs. | | | | 24 | 90 | 39 | | 1 | | | | 30 | | | | 184 |
| Vet. & Phytosanitary | 4 | 3 | 22 | 4 | 18 | 27 | 15 | 24 | | 51 | 2 | 8 | 1 | 1 | 383 | 566 |
| Fraud Control & Prvtn. | | | 10 | 3 | 11 | -1 | -1 | | | 1 | 2 | -1 | | | 10 | 32 |
| Reductions in Advances | -2 | | -27 | -45 | -311 | -40 | | -143 | | 1 | | | | | | -570 |
| Promotion, Information | 1 | | 5 | | 4 | 5 | 1 | 1 | | 4 | 1 | | | | 3 | 49 |
| Other Measures | 1 | 8 | | | | 39 | 17 | 57 | | | | | | 1 | 29 | 470 |
| Other Measures | 51 | 46 | 91 | 4 | -103 | 184 | 84 | 7 | 1 | 136 | 24 | 69 | 15 | 48 | 753 | 1448 |
| Rural Development | 32 | 35 | 708 | 75 | 540 | 609 | 327 | 660 | 10 | 55 | 453 | 197 | 327 | 151 | 184 | 4363 |
| Total* FEOGA Guarantee | 938 | 1114 | 5880 | 2616 | 6194 | 9248 | 1599 | 5349 | 30 | 1155 | 1055 | 882 | 816 | 780 | 4381 | 42083 |

* Source: 31st Financial Report on the EAAFG Guarantee Section, 2001 Financial Year, Annex 8, COM (2002).
 ** Individual values may not add exactly to Totals, due to rounding and/or small amounts unallocated to countries.

Table 24 CAP expenditures by Member State in 2001 (AIRDR, 2004).

Agenda 2000 defined two pillars of the CAP. Pillar 1 contains among other things:

- commodity market support with intervention buying or private storage aids
- 'lightweight' regimes with emergency buying and producer group support

- direct payments, often with quotas and/or reference yields and area ceilings to limit expenditure
- supply management tools such as quotas on milk supplies, maximum stocking densities and compulsory arable set-aside
- other elements such as environmental or animal welfare requirements

Data about the division between commodity market support and direct payments have not been found yet. After the publication of the *Second Interim Report* the search will, however, be continued. *Pillar 2* covers measures aimed both at the agricultural sector and the wider economic development of rural areas throughout the EU. Support offered under these measures can cover:

- *investments in farm business*: improving farm incomes and the living standards and the working and production conditions of farmers
- *human resources*: young farmers, early retirement, training
- *less favoured areas and areas subject to environmental constraints*: payments were adapted to better reflect the role which farmers play as managers of natural landscapes
- *agri-environmental measures*: the only compulsory element of the RDP
- *processing and marketing of agricultural products*: improving quality products, development of new outlets, protecting the environment
- *forestry*: investments in forests to improve and rationalise the production, processing and marketing of forestry products; maintaining and improving the ecological stability of forests in areas which act to protect the public interest
- *measures promoting the adaptation and development of rural areas*: these measures cover: renovation and development of villages and protection and conservation of rural heritage, diversification of agriculture to provide multiple activities or alternative incomes, encouragement of tourist and craft activities, and environmental protection in connection with agriculture, forestry and landscape conservation

Pillar 2 contains all rural development measures that came under the various Structural Funds before *Agenda 2000*. The 'common rules' regulation authorised 'modulation' to switch funding from Pillar 1 to certain elements of Pillar 2. This implied a further shift in favour of the reinforcement of rural development measures. The Figure below shows the budget flows via Pillar 1 and 2.

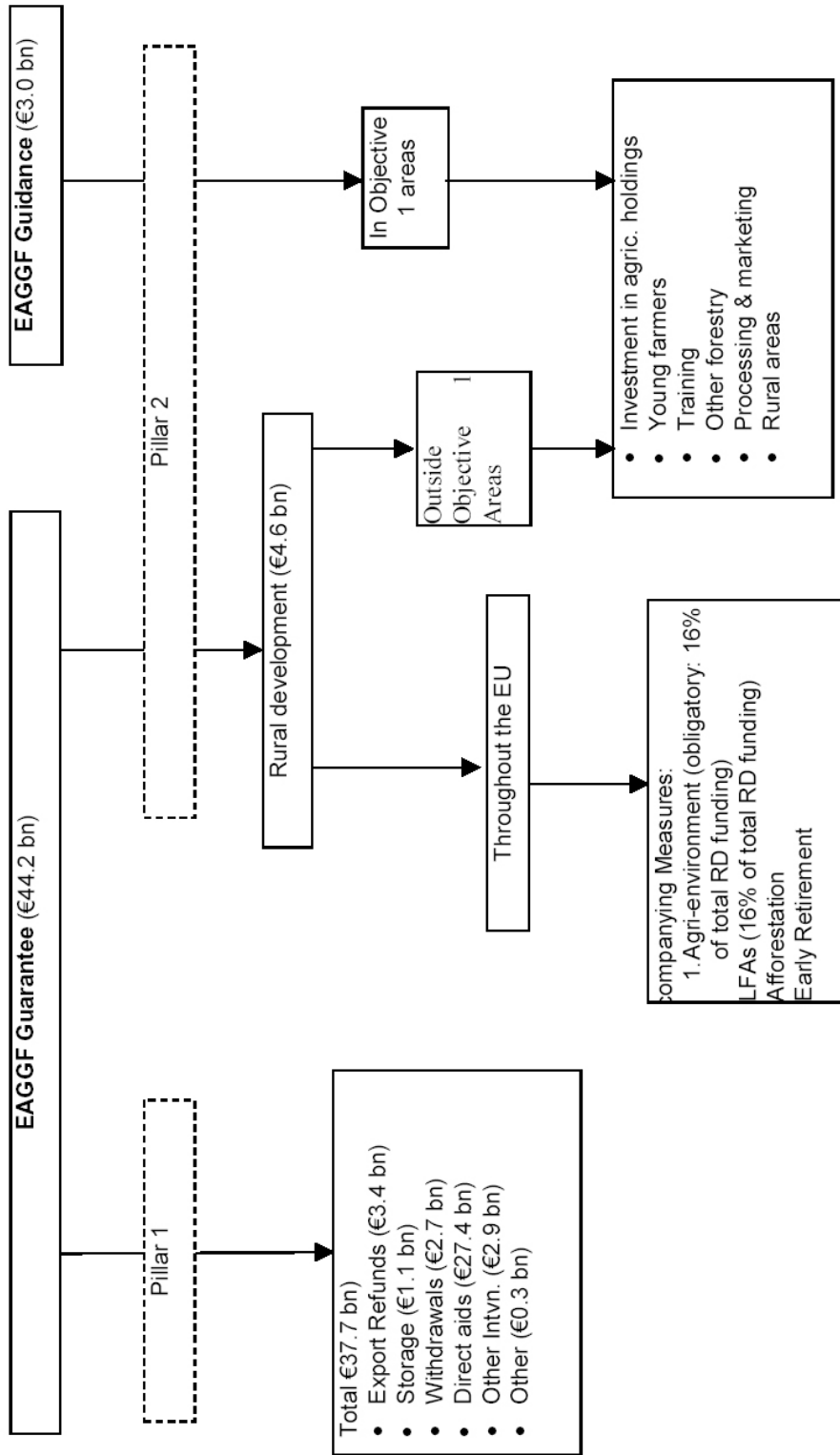


Figure 36 Budget flows via Pillar 1 and 2 in the period 2000 – 2006 (AIRDR, 2004).

The EC (2003) also agreed to simplify and further decentralise agricultural policy. *Agenda 2000* included a decision to hold a mid-term review, which set out a number of steps towards further reform of the CAP, leading to the political accord by the Council of Agriculture and Fisheries Ministers in June 2003. This defined some important changes in the direction of agricultural policy, which were also needed to accommodate the expansion of the EU with the ten new Member States. Pillar 1 payments per region and per type of farm, however, remain the same. Some key elements of the reform, which came into effect on 1 January 2005 are:

- Decoupling of direct income support to farmers for production: in future, farm payments will not be linked to the amount of subsidised crops grown or the amount of livestock held; instead, the level of income support will be based on the amount of farm receipts in the past.
- Farm payments will be conditional on meeting 18 European directives and regulations in the field of the environment, natural habitats, animal welfare and animal health (compulsory 'cross-compliance').
- Member States may use up to 10% of the farm payments as a national or regional 'envelope' to support specific forms of agriculture that benefit the environment, promote the quality of produce or market certain (e.g. regional) agricultural products.
- The direct payments to large agricultural enterprises will eventually be reduced (*modulation*) to allow money to be transferred to Pillar 2: rural development policy. This will start at 3% in 2005, rising by 1% annual increments to 5% in 2007. Each Member State will retain at least 80% of these modulated agricultural funds.
- An extra stimulus for Rural Development Policy, including the improvement of production and food quality, meeting EU standards on upkeep of the environment, animal welfare, and habitat and landscape management.

In the meantime the ten new Member States prepared their entry into the EU. Prior to the accession in May 2004 these countries have prepared their agricultural sectors and policies for EU entry and CAP adoption, e.g. by instituting CAP-like support systems and seeking liberalised trade with the EU-15. The main effect of EU accession and CAP adoption in the new Member States derived from Pillar 1, i.e. market policy and direct payments (AIRDR, 2004). As regards Pillar 2, the applicants prepared for EU entry by setting up regional authorities for the development of rural development programmes used to implement pre-accession funding via the SAPARD programme. In addition, a Special Preparatory Programme in the framework of PHARE has been established which for instance financed capacity building, training and technical assistance for the preparation of the Rural Development Plan in each applicant country.

Despite all adaptations the CAP is still a costly endeavour. In 2002 agricultural expenditure accounted for about 45% of the EU budget (Ministerie van Buitenlandse Zaken, 2003). The heads of state had already decided at their meeting in Brussels in the autumn of 2002 that the EU agriculture budget would be frozen. The budget ceiling for Pillar 1 of the CAP was fixed at €43 billion per year until 2013, which means that all agricultural payments, including those for the new Member States, will have to remain under this level. In addition, numerous adjustments have been made to specific crop and sector premiums (De Bont et al., 2003).

In July 2004 the EC put forward a proposal on the financing of the CAP and RDP (EC, 2004). The draft regulation envisages the creation of two new funds in 2007, each financing one of the two pillars: the European Agricultural Fund for Guarantee (EAFG) for Pillar 1 and the European Agricultural Fund for Rural Development (EAFRD) for Pillar 2. In order to increase

the coherence transparency and visibility of RDP and decrease the administrative burden the proposal defines three thematic axes:

- *competitiveness* (axis 1): increasing the competitiveness of the agricultural sector through support for restructuring, opening up of markets and taking into account the needs in the New Member States
- *land management / environment* (axis 2): ensuring the delivery of environmental services by agri-environmental measures in rural areas, preserving and enhancing nature and landscape, and helping to prevent the abandonment of agricultural land use
- *the wider rural economy* (axis 3): improving the quality of life in rural areas and promoting diversification of economic activities to help maintain the attractiveness of rural areas and their cultural heritage, in particular in more remote rural areas

To ensure a balanced strategy a minimum funding is proposed of 15%, 25%, and 15% related to axis 1, 2 and 3 respectively. This should safeguard that each programme reflects at least the three main policy objectives and at the same time leaves the Member States or regions a high margin of flexibility to (45% of EU funding) to emphasize the policy axis they wish in function of their situation and needs. Each programme will contain a Leader axis (minimum of 7% of EU funding) to finance the implementation of the local development strategies built on the three thematic axes.

Under the proposal total EU funding for rural development over the 2007-2013 period will be €96 billion. In 2013 the funding for the EU-27, including Bulgaria and Romania, will be €14.2 billion. The decision of the heads of state and the proposal of the EC still have to be worked out in more detail and allow the Member States a certain amount of flexibility in applying it.

Regarding the Structural Funds, between the 1989-1993 period and the 1994-1999 period Objective 5b areas were approximately doubled in area and population because of the accession of Austria, Sweden and Finland in 1995. The accession of the latter two countries was also a reason to add Objective 6. The end of the 1994-1999 period marked the emergence of a new approach. Budget cuts as well as the principle of concentration were introduced in order to increase the effectiveness of Structural Fund spending. Effectiveness was further strengthened by reducing the previous six priority objectives in the period 2000 – 2006 to three. The objectives relevant for agriculture and rural areas are:

- *Objective 1*: promoting the development and structural adjustment of areas most lagging behind. Eligible are areas that have less than 75% of EU average GDP, including the sparsely populated areas, the most remote areas and many other rural areas.
- *Objective 2*: supporting the economic and social conversion of areas facing structural difficulties, including rural areas with a decline in traditional activities.

The Guidance section of the EAGGF supports the improvement of agricultural structures and rural development within the framework of European cohesion policy. The fields of application are described below (see description of Pillar 2 measures). In Objective 1 areas these measures are financed by the Guidance section, with the exception of agri-environmental, forestation and some other measures. Outside the Objective 1 areas all measures are financed by the Guarantee section. Funding by the ERDF covers all fields of development, among which (Europa, 2004):

- rural development

- tourism and culture
- environment
- infrastructure

In these fields of development ERDF resources are mainly used to co-finance: productive investments leading to the creation or maintenance of jobs, infrastructure, and local development initiatives and business activities of small and medium-sized enterprises. The implementation principles for the Structural Funds are:

- *concentration*: of measures on the priority objectives for development
- *programming*: multi-annual development programmes lead to decisions through partnership; a managing authority, appointed by the Member State, is responsible for the implementation
- *partnership*: the closest possible co-operation between the Commission and the authorities on national, regional and local level in each Member State from preparation to implementation
- *additionality*: Community assistance complements the contributions of the Member States rather than reducing them (EU support is provided at a maximum rate of 75% of total costs in Objective 1 areas and 50% in other areas)
- *subsidiarity*: a higher authority may and must not act if an objective can be achieved satisfactorily at a lower level

2.7.1.4 Trends, driving forces and outlooks

2.7.1.4.1 Trends in agricultural practices in the CAP context

Although the CAP was primarily designed to improve the productivity of agriculture it has significant territorial impacts. Studies on the territorial impact of the CAP reveal the close and specific relationship between agriculture and the countryside (EC, 1999). In this respect EU's agricultural policy determines the development of many rural areas. Its impact varies, however, from region to region depending on the specific physical, socio-economic, and cultural conditions and partly on the types of production and market organisation.

One can observe a certain limitation of over-production. For example, cereal surfaces in the EU-12 fell by 3.4 million hectares between 1990 and 1993 and European cereal production passed from 169 million tonnes in 1992 to 164 million in 1995 (-2.9%). From 1995 on, the common wheat production, for example, climbed again in EU-15 to peak in year 2000, before falling again. This, however, did not lower up to the level of set-aside land (15%) owing to exceptional arrangements for small producers, very widely applied in the Member States with small production structures, like Italy and Western Germany. In addition, the output increased. Despite the reduction of exploited surfaces, certain Member States like Germany and the Netherlands increased their cereal harvest. Others, on the other hand, had their tonnages reduced by more than 10%, such as France and Ireland. The expectation is that in the near future – as a result of improving technologies and rising inputs – all yields in the new Member States will increase, not only absolutely, but also relatively to the corresponding EU-15 average.

The fall in intervention prices has increased the strength of the market. This had at least two consequences. Productions with industrial purpose strongly increased, and intensified.

European colza production strongly fell after 1992, but as from 1993, the increase in world prices revived its production, to exceed its level of before the reform (it is now used for substitute fuel production). European sunflower surface also fell the first year before increasing again. Intensification continued in a number of areas (the increase in cereal production and the continuation of the development of irrigation clearly testify this). Moreover, new crops appeared, be it crops with industrial purpose or not protected crops, competitive on international markets. In Champagne-Ardenne and the Bergamo Province, for instance, an intensification of cereal cultivation can be observed and at the same time new crops not supported by the CAP are strongly developing (flowers in the Bergamo Province and potatoes and vegetables in Champagne-Ardenne).

Despite a number of obvious improvements, the CAP reforms did not change significantly the general orientation which started in the 1980s: annual crops to be sold outside holdings strengthened their position with respect to surfaces still in grass and to perennial crops. Whereas most cultivated surfaces were declining, the surfaces of the most productive crops increased.

Direct payments and agro-environmental measures slowed down the agricultural abandonment in the less favoured areas, without stopping it. A continuation of agricultural abandonment in those areas is observed. In certain cases, the implementation of direct payments occurred with a considerable delay. For instance, in the Bergamo Province the first direct payment measures hardly started to be applied in July 2000, i.e. with a delay of more than 7 years.

The CAP (together with other Community policies) contributes to a further strengthening of territorial dualisation in rural areas. Partly under the effect of market forces and partly owing to the CAP support itself, a dualisation of the systems of agricultural production has taken place and continues to take place. In the New Member states, the existing dualisation is also a major problem. On the one hand, a concentration and an intensification of production (especially of the major crops) is developing in the most fertile areas, and on the other hand, more extensive agriculture and agricultural abandonment are progressing in the LFAs.

Despite a number of improvements, the CAP reforms have not significantly changed the orientation towards a further territorial dualisation in rural areas. However, it is expected that the number of very small farms will decrease in the new Member States and that agricultural land will be moved to larger holdings. It is expected that the agricultural abandonment in the LFAs will continue because the level of agricultural support has been fixed after the last CAP reform and the number of Member States has increased after the last EU enlargement. It is also expected that extensive livestock-farming will disappear and be replaced by forests or by a natural afforestation, while intensive stock-breeding will develop in more favoured areas, in particular in the cereal producing areas. The most important reason for this is that agricultural support is much more connected to types of production than to types of territories. Robert et al. (2001) therefore conclude that it appears urgent to investigate the possibilities of introducing stronger territorial components into the conception of the agricultural policy so that it becomes a true rural development policy.

Regarding environmental pollution by agriculture it must be remarked that the major farming transformations connected with the period of strong increase in agricultural productivity were reduced but not stopped. The intensification of certain agricultural productions, in particular in the field of cereals, is still topical and the expansion of irrigation contributes to this phenomenon. The development of intensification of livestock-farming in or near the cereal areas, encouraged by various factors (fall in cereal price, support to fodder-maize) is also noticed. In certain regions concerned with this type of development

(for instance the chalky plain in Champagne), environmental consequences, in particular on ground water, are perceptible.

Intensification and scaling-up of agricultural production had and still have large impacts on the various landscapes (see figure below)⁴. Intensification has most of all taken place in open fields, polders and deltas situated close to urban areas. Intensified arable and dairy farming have caused serious damage to landscapes and environment in these areas. The scaling-up of production has also occurred most profoundly in the open fields. In many British areas this implied that bocage landscapes were changed into open fields. There are also many areas in which agriculture is marginalising, e.g. high and low mountains and islands. One of the consequences is that these areas are facing depopulation.

⁴ De Pater et al (2004) describe the following landscape categories:

- *Bocages* are small scale landscapes in which small scale and scattered properties are divided by hedge rows, wooded banks, and little walls. Bocages are found in western France and on the British islands.
- *Open fields* are large scale open landscapes in the zone from the Basin of Paris to the east. These landscapes are dominated by large scale farms cultivating cereals, sugar beets, and potatoes. They are also found in the Mediterranean area.
- *Sandy landscapes* are a mosaic of large and small scale arable land, meadows, and woods. These landscapes are found in the zone from Flanders, via the south and east of the Netherlands and northwest Germany to Jutland.
- *Polders and deltas* are large scale and often fertile agricultural landscapes in the coastal zones of East Brittan, the Netherlands, and also in the South of Europe. Arable and dairy farming dominate in these landscapes.
- *Low mountains* are found in central Europe, the British uplands, and the North of Scandinavia. Agriculture is difficult in these landscapes because of short growing seasons and geographic relief.
- *High mountains* like the Alps are nowadays less used for agriculture and more fore tourism. Production is relatively low because of the difficult geographical conditions.
- *Mediterranean areas* contain very specific landscapes like the 'coltura promiscua' (small scale fields divided by pollard trees) in central Italy and the 'montados' (savannah-like landscapes) on the Iberian Peninsula.

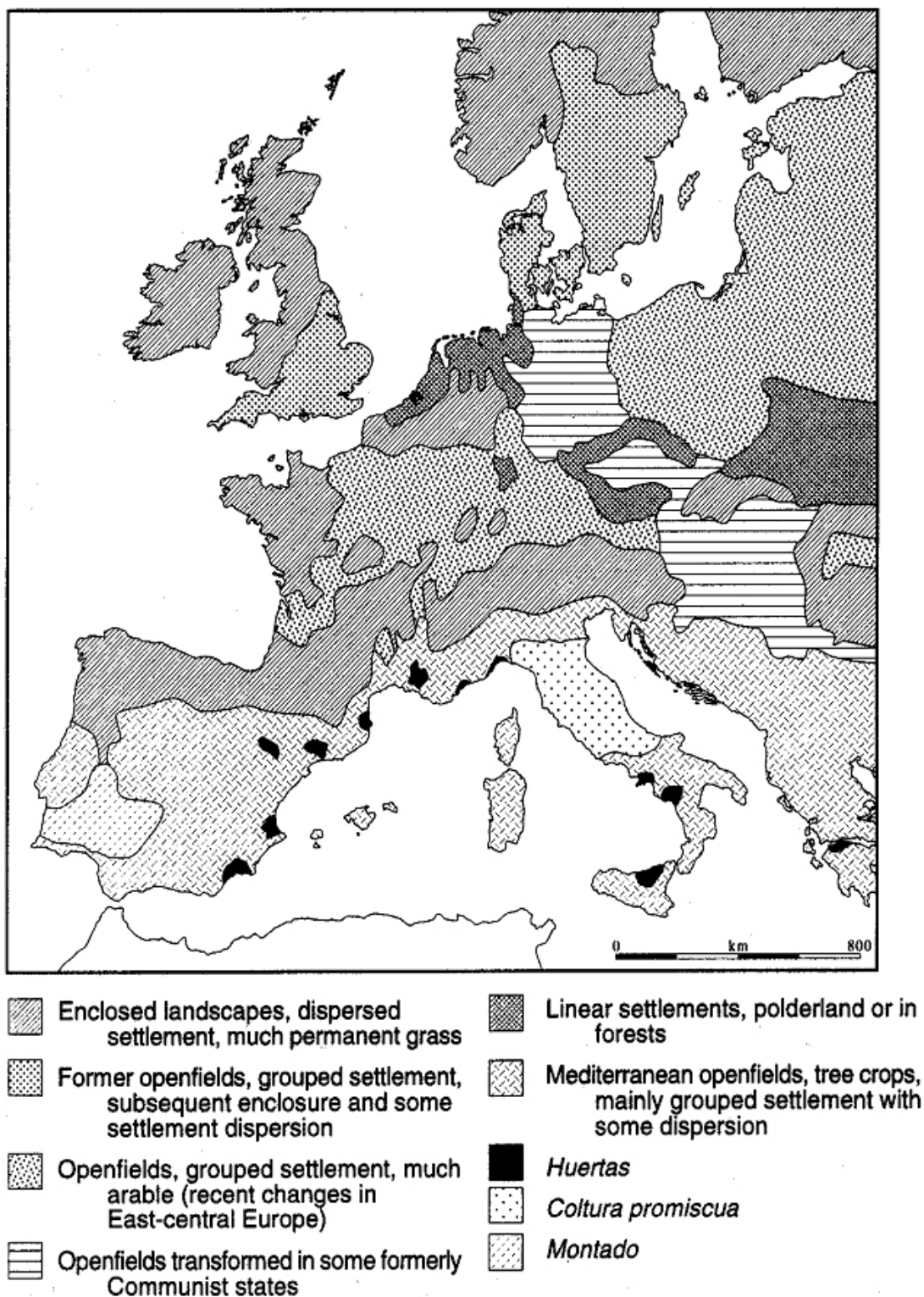


Figure 37 Landscapes affected by agriculture (Clout, 1998).

ESPON project 2.1.3 (AIRDR et al., 2004) concludes that the distribution of the CAP support is not consistent with the economic or social cohesion objectives of the EU. This is especially

true for the largest element of the CAP, the market price support. With its strong production focus, this support benefits richer regions, regions with lower unemployment rates, regions with growing populations and more accessible regions. The reason for this is that market price support accrues disproportionately to intensive large-scale farmers, which are mainly concentrated in the open fields and in the polders and deltas. Direct income payments, however, are higher in areas with a low GDP per capita, with high unemployment rates and falling populations. This is true for the EU-15 as well as for the new Member States, where not all groups of farmers will equally benefit from accession. For instance, calculations for Poland indicate that in the first year after accession, the gross farm income of the entire sector will reach 128% (direct payments: 35% of EU level) to 147% (direct payments: 55% of EU level) of that in the year 2001/2002.

Since market price support and direct income payments (Pillar 1) are not designed as a cohesion instruments the findings just mentioned are not surprising. LFA and agri-environmental payments (Pillar 2), however, might be expected to be distributed more in line with cohesion objectives since these payments aim at integrated rural development. However, higher levels of LFA and agri-environmental payments are accrued to richer regions, which are also more accessible. A reason for this is that richer regions prioritise agri-environmental objectives more than poorer regions. Pillar 2 support is less strongly related to farm size and intensity of production than Pillar 1 support. Figure 36 provides an overview of the total Pillar 1 and Pillar 2 support. Both Pillar 1 and Pillar 2 support tend to benefit the most urbanised regions in Europe. In terms of the regional typology of ESPON project 1.1.2 on urban-rural relations 'urban, high human intervention' and 'urban, low human intervention' receive the largest shares. The reason for this is that the most urbanised regions account for the most significant shares of agricultural area and labour force (AIRDR et al., 2004).

A number of positive developments, however, can be observed as well. The agri-environmental actions apply to 27 million hectares within the EU-15 (20% of the cultivated land). The actions contribute to the maintenance of agriculture in backward areas and have a positive impact on natural areas. They also contribute to the reduction of soil pollution and of ground water and river pollution. However, the implementation of agri-environmental measures is generally weak in highly productive areas, as well as in very backward areas. The afforestation measures have a rather significant impact, since 500,000 ha have been afforested between 1992 and 2001, which contributes, in a considerable number of cases, to the regeneration of ecosystems and the development of biodiversity. The development of the cultural heritage of rural areas has become quite popular in the EU-15 and the Community funds available in this field are being used efficiently. Attempts are going on to integrate agricultural policy with the broader economic, social, cultural and environmental context of rural areas. Diversifying farming into activities such as the development and marketing of high quality products, agricultural tourism and investment projects related to the environment, which have until now been marginal, can open up new opportunities (EC, 1999).

2.7.1.4.2 *Outlooks for agricultural markets*

In *Prospects for Agricultural Markets 2004-2011* (2004) DG Agriculture presents medium-term perspectives that consist of a set of market projections. These projections are established under a specific set of assumptions. The most important assumptions cover agricultural and trade policies, as well as the outlook for the macroeconomic environment and for world agricultural commodity markets. These assumptions have been defined on the basis of the information available, which at the time of the analysis were judged the most plausible.

- The implementation of the single farm payment scheme as part of the CAP reform of 2003 allows Member States to choose among different options, which will influence the degree of 'decoupling' of the payments. For the purpose of these projections, a series of assumptions has been made regarding the implementation option, which will be adopted by each Member State for the sectors concerned. Based on the information provided by Member States, it has been estimated that in 2011 approximately 90% of the budget including national envelopes and top-ups allocated to direct payments for the arable crops, milk, beef and sheep will be part of the single farm payment on average for the EU-25. The rate is higher for milk (100%), arable crops (93%), but lower for beef and sheep (78% and 73% respectively).
- All transitional measures of the CAP in the new Member States, i.e. the phasing in of direct payments as well as the top-up possibilities and the quotas, are expected to operate under the rules agreed upon in the Copenhagen summit. Eight out of the ten new Member States adopt the simplified area payment scheme, while Slovenia and Malta implement the single farm payment. From 2009 onwards the eight new Member States are assumed to adopt the regionalised system. Slovenia and Malta would implement the regionalised system from 2007 onwards.
- After a reduction to 5% for 2004/05 marketing year, the set-aside rate returns to the nominal 10% level in 2005/06 and remains fixed for the rest of the period. For those new Member States, which opted for the simplified area payment scheme, the set aside obligations would only apply from 2009 onwards.
- It is assumed that all commitments taken within the Uruguay Round Agreement on Agriculture (URAA), regarding in particular market access and subsidised exports will be fully respected. Thus, subsidised exports are expected not to exceed the annual URAA limits, whereas imports under current and minimum access are fully incorporated. In addition, the URAA commitments are assumed to remain unchanged over the 2004-2011 period. Furthermore, the trade agreements that have been concluded by the EU prior to the end of June 2004, notably with the Least Developed Countries, have been included into the projections.

Short-term developments on world agricultural markets have recently been marked by sharp price increases, in particular for cereals, oilseeds, beef and dairy, linked to unfavourable climatic conditions and sanitary crises. Over the medium-term, world agricultural markets are projected to be essentially supported by rising food demand driven by an improved macro-economic environment, higher population, urbanisation and changes in dietary patterns. The expected recovery in the economic situation of the EU should further contribute to support the medium-term prospects for EU agriculture.

Favourable medium-term perspectives on the world market, both for price and import demand, would enable the EU to expand its cereal exports to 34 million tons, thus exceeding the annual limit for subsidised exports set by the URAA thanks to some unsubsidised exports of durum wheat, common wheat and malting barley. These perspectives however rely on supportive developments in the currency environment. Total cereal imports are estimated to stabilise at around 10 million tons over the medium-term in the face of the rising exportable surplus from the Black Sea region at competitive prices.

Cereals and oilseeds

The total cereal area in the EU-25 is expected to increase in 2005 but should fall slightly again in 2009 when the majority of new Member States are expected to implement the set aside obligation.

The medium-term projections depict an outlook for the EU cereal markets that would continue to appear rather favourable for most EU cereals (wheat, durum wheat and maize),

which should exhibit strong gains, whereas *barley* would display a declining trend linked to less favourable profitability prospects. Thus, *barley* would lose competitiveness on the feed market against feed wheat and maize. *Barley* feed demand would therefore decline over the medium term. The projected rise in cereal yields would more than offset the decline in cereal area.

Prospects on *maize* markets, especially in the new Member States, would remain positive. EU production would modestly expand. One fourth of it would be produced in the new Member States. The maize surplus is expected to be exported on world markets. Producer prices of maize in the EU-25 would decrease on average after enlargement. However, the segmentation of maize markets would lead to a strong regional price differentiation within the EU.

Limited adjustments are expected over the medium term in the *rye* sector as producers largely anticipated the implementation of the CAP reform with a drastic reduction in rye area in 2002. Sustained exports of rye at around 1 million tons should help stabilising producer prices.

The EU *oilseed* sector is foreseen to display a gradual improvement in its production potential on account of moderate productivity increases and supportive price prospects, fuelled by continuous positive trends for global demand of vegetable oil. These perspectives would however rely on expected favourable developments on the world grain and oilseed markets and in the currency environment. About one fourth of EU oilseeds are grown in the new Member States. An expansion of oilseed area in the new Member States is expected to relate to better price conditions for sunflower seed. Production of oilseeds in the EU-25 would expand modestly from if currently applied energy and tax policies in Member States remaining unchanged over the medium term. Despite the projected moderate increase in oilseed production, the EU remains a large net importer of oilseeds, notably of soybeans and sunflower seed, in order to meet domestic demand.

Meat and eggs

The EU meat sector came back to a more normal situation after the extreme market conditions due to the second BSE scare and the FMD outbreak in 2001 and the avian flu in 2003. EU-25 beef and veal consumption recovered rapidly and was higher than production in 2003 for the first time in 20 years. It is expected to remain so over the forecasting period, with production fluctuating around 8 million tons. *Beef* production of the EU-25, of which the new Member States contribute for around 8%, is expected to increase somewhat in the short term. Over the medium term however, beef production is expected to decrease until 2011. Tight domestic supply and steady demand is projected to keep prices at a relatively high level, attracting more imports.

Pork production, which is driven mostly by internal and external demand, is expected to increase until 2011. Extra EU-25 exports are expected to increase slightly over the medium term, while the intra community trade is projected to increase, as consumption is expected to increase at a faster rate than production in the new Member States. Thus, the medium and long-term outlook for pork consumption is, in general, positive since pork is likely to continue to be favoured by consumers, although clearly less than poultry.

The medium-term outlook for *poultry* production is relatively positive as competitive prices compared to other meats, strong consumer preference and increased use in food preparations should continue to play in favour of poultry. Per capita consumption is projected to increase steeply in the new Member States. Poultry imports, which have strongly increased in the last few years, are expected to keep growing over the long term, with increased imports of frozen fillets and mainly cooked and processed poultry meat.

In recent years *egg* production has seen increasing investments in some regions of the EU. Whereas production growth would be constrained in the EU-15 by higher production costs and lower margins, it is expected to gather pace in the new Member States thanks to relatively favourable production conditions. Egg consumption would increase over the medium term due to higher income and changes of dietary patterns in some regions of the EU. Consumption would rise and imports would remain relatively constant, while exports would gradually decline until 2011.

For *lamb and goat meat*, a slight downward trend both for production and per capita consumption is expected over the medium term. Imports are projected to increase slightly in response to a somewhat better use of market access commitments by some third countries.

Dairy products

Milk production in the EU-25 is expected to follow the evolution of the milk reference quantities. In the EU-15 production is closely linked to milk quotas as on farm consumption, not being governed by quotas, only plays a minor role. The quota increases decided within the CAP reform of 2003 are likely to slow down the long-term decline of the dairy herd. Assuming a further increase in milk yields until 2011, the number of dairy cows in the EU-15 is projected to decline.

On-farm use of milk and direct sales are still very important in the new Member States, accounting for more than 20% of total production. Until 2011, subsistence production is expected to gradually decline due primarily to the projected positive development of rural economies and social security systems after enlargement, which should provide viable economic alternatives to subsistence farmers. These developments are expected to offset the foreseen milk quota increases in the new Member States.

The outlook for the EU-25 *cheese* consumption is positive. Per capita consumption is projected to rise until 2011. This increase will be faster in the new Member States whose cheese consumption is expected to grow by 25% until 2011. The steady growth in domestic consumption is expected to absorb most of the increase in cheese production, limiting somewhat the growth in exports.

Butter production is projected to decrease over the medium term as the lower intervention prices decided under the 2003 CAP reform will reduce the attractiveness of intervention purchase. The quota increases decided for the period 2006/07-2008/09 are not expected to change this downward trend as the production of other dairy products is projected to absorb most of the additional deliveries. The decreasing production should ease somewhat the pressure on intervention stocks, which are expected to be gradually reduced from 2004 onwards. Butter consumption still tends to decline despite some signs of stabilisation observed over the most recent years.

2.7.1.4.3 Other factors of change

Environmental friendly and healthy production

Organic farming, biological, integrated and ecological productions are qualitative adaptation strategies to open new niches in the consumer's preferences. Marketing, labelling, regionalisation and direct marketing are additional strategies. On average in the EU-15, less than 2% of farmers were engaged in organic farming in 2000. Sweden (11.0%) led, followed by Austria (9.7%), Finland (6.1%) and Denmark (4.3%). Greece and Portugal (0.2% each) had the lowest percentages. The areas devoted to organic farming have grown throughout the region of the new Member States, albeit from a very small base. The degree of support for conversion varies significantly between the CEECs. Some of them, like

Slovenia, have recognised that Pillar 2 measures will be of vital importance to the survival of their agriculture; greater domestic support and a long history of capacity building in this area have reinforced this.

Alternative income sources

To create alternative income sources in rural areas, the most positive expectations exist for tourism, followed by manufacturing, specialist food and drink and ICT. Other sectors in the New Member States which are expected to grow are infrastructure in Poland, energy in Estonia, landscape and environmental management in the Czech Republic and trade in Hungary and Slovakia. Conditions for growth include infrastructure, natural conditions (coasts and mountains for tourism), the proximity of neighbouring countries (for trade), an industrial base, effective institutions and communications.

For most of the regions, the contribution of (agro-)tourism will probably only be of minor importance, since the tourism market is a global, highly competitive market. In addition, the development of the necessary basic infrastructure and institutions to support tourism is hampered by a lack of capital. It is likely that only in certain areas with favourable conditions can tourism play an important role. Diversification of agricultural income could be 'camp sites on farms', day-care for mentally handicapped etc. The same situation and problems can be expected for other sectors, especially ICT.

Start-ups are on the whole less frequent in rural and poorer regions. This may be explained by a lack of entrepreneurs, in combination with poor business conditions. Where information on business start-ups is reported, it would seem that the number of such businesses per capita of population, and their small size, are insufficient for creating significant growth.

Genetically modified crops

IPTS (2002) presents a scenario study on the co-existence of genetically modified (GM), conventional and organic crops in European agriculture. Co-existence means that farmers should be able to freely adopt the agricultural production system they prefer. Production systems can be differentiated into conventional systems including GM crops, conventional systems using non-GM crops and organic farming systems using exclusively non-GM crops.

Of course, different types of agricultural production are not naturally separated. The cultivation and use of GM crops is strictly regulated in the European Union. However, the adventitious presence of GM crops in organic or in conventional crops cannot be excluded during cultivation, harvest, transport, storage, and processing. If GM crops increase their share in EU agriculture, the question rises whether adventitious presence of GM crops in organic or in conventional crops at farm and at regional level could significantly increase if current farming practices are maintained.

In the Communication on *Life Sciences and Biotechnology*, the EC has committed itself to take 'initiatives to develop, in partnership with Member States, farmers and other private operators, research and pilot projects to clarify the need and possible options, for agronomic and other measures, to ensure the viability of conventional and organic farming and their sustainable co-existence with GM crops'.

Climate change

Climate change is the biggest environmental threat our planet is facing. The excessive burning of coal, oil and gas, but also intensive agriculture and forest cutting lead to greenhouse gas emissions into the atmosphere, where these gases trap the sun's heat. The consequence: the world is getting warmer. Europe is warming faster than the global average. The temperature in Europe has risen by an average of 0.95 °C in the last hundred years and is projected to climb by a further 2.0-6.3 °C this century as emissions of greenhouse gases continue building up. This global warming has severe effects on the

potential for agricultural use: the risks of droughts and water shortages, landslides, flooding, summer and winter storms, in general a change of the conditions for agricultural production.

According to the International Panel on Climate Change (2001) the growing season lengthened by 1 to 4 days per decade during the last 40 years in the Northern Hemisphere, especially at higher latitudes. Plant ranges shifted pole ward and up in elevation, combined with an earlier plant flowering. In 2002/03, a harsh winter and late spring frost in much of Europe were followed by a heat wave that started in June, causing crops to develop up to three weeks too early for their ripening and maturing stages, when there was insufficient soil moisture. The persistent drought has reduced yields by up to a quarter in many parts of Europe for major crops such as wheat, sunflower and potato. Crop harvests in many southern countries were down by as much as 30%. The 2003 European heat wave destroyed €11 billion worth in crops. With many of the crops used as livestock feed, the shortfall is thought likely to have a knock-on effect on meat prices. More frequent and more economically costly storms, floods, droughts and other extreme weather conditions that have an impact on agriculture are expected for the future.

The European Public Health Alliance (<http://www.epha.org/a/990>) predicts that from 2070 onwards summer heat waves in Europe will be the norm as a result of climate change. One summer in two will be at least as hot as 2003 when daytime temperatures exceeded 30 degrees Celsius and soared to peaks of 40 degrees. These temperature changes would make it harder for farmers to adapt to the new conditions by bringing in new crops more adapted to a hotter climate. Drier weather in central and southern Europe could threaten agriculture in some areas through substantial drops in quality and quantity for key crops. However, climate change does appear to have some positive impacts, too. For example, agriculture in most parts of Europe, particularly the mid latitudes and northern Europe could potentially benefit from a limited temperature rise.

Role of agriculture and rural areas in energy production

The rural areas have production potentialities for developing alternative and renewable energy sources like bio-fuels, wind energy, photovoltaic, solar thermal (solar thermal power plants and solar energy in buildings), hydro (small and large scale), biomass and geothermal. Their obvious attraction in terms of energy supply is that they are either naturally occurring or can be replaced quickly, do not need to be imported, and in general have less impact on the environment than conventional energy sources. In the long term, with appropriate development and promotional support, they could help significantly to combine secure energy supplies with a healthy environmental and economic performance in the rural areas, because a significant proportion of new sources will come from the agricultural sector, in particularly wood fuels and liquid bio-fuels⁵. The two most common bio-fuels are ethanol and bio-diesel. Bio-fuels made out of biomass are used for transportation. Wood and methane gas are used for heating, in particular in rural areas.

Renewable energy sources are currently unevenly and insufficiently exploited in the European Union. Although their potential is significant, renewable sources of energy make a disappointingly small contribution of around 6% to the EU's overall gross inland energy consumption, of which 4% is hydropower. Some countries, like Austria and Sweden, France and Italy have a large renewable energy sector. Other countries, like Germany, have intensive programmes or legislation in favour of renewable sources. Still other countries have little exploitation of renewable sources. The renewable energy industry has created many new jobs. The Danish wind industry, for instance, has created 15,000 jobs.

For the rural areas, especially biomass energy could be an important development factor.

⁵ Bio-fuels are alcohols, ethers, esters, and other chemicals made from celluloid biomass such as herbaceous and woody plants, agricultural and forestry residues, and a large portion of municipal solid and industrial waste.

Many farmers already produce biomass energy, which comes in many forms. Virtually all plants and organic wastes can be used to produce heat, power, or fuel. Biomass energy has the potential to supply a significant portion of Europe's energy needs, while revitalizing rural economies, increasing energy independence, and reducing pollution. Farmers would gain a valuable new outlet for their products. Rural communities could become entirely self-sufficient when it comes to energy, using locally grown crops and residues to fuel cars and tractors and to heat and power homes and buildings. In the long term, Biomass has a theoretical potential of up to 20 % of current primary energy supply, assuming 20 million ha of arable land for fuel crop with a yield of 6 ton oil equivalents of biomass per ha and the availability of 150 million ton oil equivalent of waste biomass.

2.7.1.4.4 *Driving forces behind changing EU Policies*

Section 2.7.1.3 described the introduction and the most important changes of the CAP, RDP, and the Structural Funds. Most attention has been paid to the most recent reforms of these policies because they imply a shift towards a more market oriented agriculture and toward integrated rural development. The described reforms are stimulated by various driving forces. This section describes the most important forces.

Interest groups

Interest groups can be very influential. Agricultural interest groups organised an effective coalition on the European level that influenced the CAP, RDP and Regional Policy significantly. In the 1945 – 1975 period, these interest groups together with the food industry, the Member States, members of the EC and the EP, civil servants, scientists and others formed a strong coalition for the introduction and the further development of the CAP. Referring to the experience of food shortages in the Second World War they effectively lobbied for the implementation of measures like price support, income support, import restrictions, and export subsidies and also for the subsequent increases of the European Agricultural Fund. Until now the agricultural interest groups still have a large impact on the CAP although the economic significance of agricultural and the number of farmers have significantly decreased. The agricultural sector, however, is still a well organized and closed community (Rotmans, 2003).

In the 1975-2004 period environmental groups and third world groups became more and more effective, although they never became so effective as the agricultural interest groups (ibid). Together with scientists, Member States, members of the EC and the EP, civil servants and others, they criticized the environmental pollution, the affection of natural habitats and cultural landscapes, and the distortions of the global markets stimulated by the CAP. Their lobbying activities stimulated the subsequent reforms of the CAP (e.g. integration of environmental concerns in agricultural policy), RDP (e.g. agri-environmental measures and measures for afforestation) and the Structural Funds (e.g. environmental measures) to certain extents.

Animal diseases and food scandals

In the 1990s and the beginning of the 21st century the subsequent break-out of animal diseases, like BSE, FMD, and avian flu, caused serious agricultural crises in various Member States. These epidemic diseases not only caused large negative economic impacts on individual farmers and large collective investments in order to combat the diseases. They also had large negative impacts on the reputation and the confidence of consumers in agricultural production. This was further enhanced by some subsequent food scandals caused by the use of polluted fodder and overdoses of pesticides and herbicides (Kol, 2002). The media attention paid to these crises put issues like food quality, food safety, and animal welfare high on the societal and political agenda. In the subsequent CAP reforms more and more attention was being paid to these issues, e.g. by introducing the principle of

compulsory 'cross compliance' in the CAP reform of 2003.

WTO negotiations

The GATT and later the WTO negotiations aim at realising more open and competitive global markets for agricultural and other products. The pressure for CAP reforms was significantly intensified by these negotiations. The EC (1999) expects that the present WTO negotiations will lead to reductions of agricultural payments and tariff walls. This will have in turn significant impacts. The reduction of agricultural payments will reduce the tax burden for EU citizens or will provide the opportunity to use EU budgets for other purposes. The reduction of tariff wall will reduce the prices for agricultural products. At the same time, however, the reductions of agricultural payments and tariff walls will increase the pressure on farmers to intensify production which may in turn have considerable negative impacts on landscapes and the environment. Moreover, it may become more difficult to implement 'non-trade concerns', like environmental and food safety criteria. Furthermore, agriculture in rural areas with a weak economy will be exposed to greater economic pressure, thus increasing the need for better strategies for spatial development, including environmental management.

EU Enlargement

Until now, almost every entry of a group of new Member States into the European Community generated larger budgets and adaptations of the CAP, RDP, and the Structural Funds. Every group of new Member States brought in his own problems and challenges (De Pater, 2004). The CAP was first of all designed for agricultural production in the six original Member States of the EEC. The accession of Denmark and the British islands in 1973 implied not only the addition of some very productive and efficient agricultural areas but also more agricultural payments and therefore a larger budget. The accession of Greece, Spain and Portugal in the 1980s implied a change of orientation of the CAP from the north-western to the Mediterranean areas, including greater support for southern European produce. At the same time this enlargement caused a move towards significant redistributive policies in terms of what was later to be known as the Structural Funds.

The accession of Austria, Finland and Sweden in 1995 led to more emphasis on the stimulation of mountainous areas and regions with exceptional low population density. This resulted among other things in the addition of Objective 6 to the Structural Funds. The enlargement to Central and East Europe in 2004 implies that the same budget for Pillar 1 payments must be divided by more farmers (11 instead of 7 million farmers) because the heads of state have decided to freeze the budget until 2013. Pillar 2 payments may be increased but they also have to be divided by much more rural areas (as an indication: 108 million ha of agricultural land instead of 70 million ha) (Rienks et al., 2004). This requires a more selective application of Pillar 2 measures to the rural areas which are most in need of support. Most of these rural areas are found in the CEECs.

2.7.1.5 Relations with other sectors and themes

Agriculture and rural areas are related to many other sectors and themes. This section describes the relationships with the following sectors and themes.

The economy

Although agriculture occupies by far the largest part of rural areas in Europe in terms of economic functions, its role has significantly declined over the past decades. At the same time other economic functions have emerged and developed in the rural areas, like industrial, residential, tourist, and leisure functions. Expectations are most positive for tourism, followed by manufacturing, specialized food industries, and ICT. This tendency,

stimulated by the emergence of the 'experience economy', enhances the diversification of rural areas. Rural areas dominated by agriculture lose importance but at the same time rural areas in urbanized regions, rural areas attractive for tourism and rural areas with a variety of activities gain importance. Many rural areas have, more or less explicitly, turned to the mentioned activities as alternative development strategies. In many cases commodification of local recourses, like natural and cultural heritage, has helped to strengthen the economic basis of rural areas. This is stimulated by RDP measures aiming at the development of the vitality of rural areas. In the recent EC proposal, stimulation of the wider rural economy has been defined as one of the three thematic axes.

Despite its decreasing economic significance, agriculture is still a heavily subsidized sector. In 2002 agricultural expenditure accounted for about 45% of the EU budget. In the same year the heads of state decided to fix the budget ceiling for Pillar 1 at €43 billion per year until 2013. If we add to this the fact that the import tariffs keep the prices for agricultural products artificially high, the total costs for EU citizens/consumers amount to about €120 billion per year (Kol, 2002). Transfers related to agriculture are therefore very high compared to other countries as the following table shows. The table also indicates, however, that transfers in European countries outside the EU are even higher. Austria and Finland had to lower transfers therefore when they entered the EU. This means that the EC has a moderating effect on the Member States.

| Countries | Transfers related to agriculture per capita |
|---------------|---|
| Australia | 92 |
| Canada | 143 |
| EU-15 | 312 |
| Japan | 489 |
| New Zealand | 47 |
| Norway | 576 |
| Switzerland | 766 |
| United States | 283 |

Table 25 Transfers related to agriculture 1997-1999 per capita (OECD, 2000).

In economic terms the protection of agriculture has large negative impacts, since the protected and therefore not-competitive agricultural sector applies production factors (land, labour, capital) that could have been applied in a (much) more productive way. Gylfason (1995) calculated that complete liberalisation of agriculture would generate an extra economic growth of 3 percent points and a decrease of unemployment of 4 percent points. Moreover, developing countries would gain approximately €20 billion per year, three times the amount of the development aid they receive (*Internationale Samenwerking*, March 2001). Drastic liberalisation, however, will force agriculture to further intensify and scale-up production, which will generate many negative impacts, e.g. on nature, landscapes and the environment (see below). The actual measure of liberalisation will depend on the results of the present WTO negotiations.

Demography

Some rural areas are subject to depopulation and ageing of the population. This is especially true for rural areas with low accessibility, e.g. high mountain areas or peripheral areas officially defined as 'LFAs'. An important factor is the low socioeconomic viability of these rural areas, which in its turn causes an out-migration of younger people searching for jobs, higher incomes etc. in rural or urban areas with a higher socioeconomic viability. This often starts a vicious circle eroding the preconditions for endogenous growth. RDP stimulates the

socioeconomic viability of these rural areas but in practice the competences of authorities and their partners in these areas are often insufficient to utilize the provided opportunities.

Other rural areas, like rural areas in urbanised regions, rural areas attractive for tourism or rural areas with a variety of activities are subject to re-population, especially by the in-migration of retired people. Motivations are rejection of the city, attraction of the countryside, a change of life-style etc. The in-migration of retired people further enhances the ageing of the population. But at the same time it has a positive impact on the socioeconomic viability of the area, for elderly people leaving the cities are on average wealthier than others. This is especially true for international retirement migrants (Vandermotten, 2004).

Environment

Agriculture affects the environment in various ways. Production growth in agriculture is achieved at the expense of nature, landscape and the environment. Intensification, concentration and specialisation of production generate side effects, like the use of large natural areas, monotonous landscapes, pollution of ground water, and reduction of biodiversity (EC, 1999). Especially large-scale arable and dairy farming, intensive cattle farming and horticulture put nature, landscape and the environment under high pressure. At the same time arable land is abandoned, especially in the LFAs. This often leads to waste land and sometimes, as a positive impact, to natural afforestation.

Environment policy has a growing impact on agriculture. The Single European Act mandated the consideration of environmental protection in the CAP. This led to the introduction of agri-environmental measures and to a stronger (but still weak) element of environmental conditions in some other measures, like stocking limits (AIRDR, 2004). The subsequent CAP reforms implied increased attention for the environment, first on a voluntary and later on a compulsory basis. *Agenda 2000* made agricultural payments conditional on meeting directives and regulations in the field of environment and natural habitats. And agri-environmental measures became in integral part and also a compulsory element of RDP. The EC proposed to define environment as one of the three thematic axes of RDP. Robert (2001), however, concludes that pollution and abandonment of agricultural land have been reduced but not stopped. It is uncertain whether the recent CAP reforms and the proposal of the EC are sufficient to reduce pollution more substantially.

Liberalisation of agriculture, stimulated by the WTO negotiations, may enhance the negative impacts of agriculture on nature, landscapes and the environment. Reduction of agricultural payments and tariff walls, for instance, will increase the pressure on farmers to intensify and scale-up production and use more fertilizers, pesticides etc. (Smeets et al., 2002). Moreover, it may become more difficult to implement 'non-trade concerns', like environmental criteria.

Energy

Agricultural production demands sometimes large amounts of energy. This is especially true for hothouses demanding energy for heat and light in order to stimulate the growth of crops. As section 2.7.1.2 describes, there are, however, possibilities for energy saving, most particularly in agro-production parks, providing opportunities for energy management, and thereby for combining energy saving and reduction of production costs.

Agriculture also supplies energy. In the 1990s the production of biomass grew by almost a third, from 40 to 50 megaton oil equivalent. Farmers may produce energy crops as an alternative to food production. In the long term, biomass even has a theoretical potential of up to 20 % of current primary energy supply. Rural areas also have production potentialities for wind energy, photovoltaic, solar thermal, geothermal, and hydropower. Although renewable energy has the advantage of saving conventional energy sources and reducing

pollution it may have the disadvantage of affecting nature and landscapes. The production of biomass requires large amounts of land, which otherwise could be available for natural woods, and large-scale production, affecting small landscape elements. Wind mills may have a negative impact on the landscape as well. Production of renewable energy, especially large-scale production, should therefore be carefully planned and submitted to environmental impact assessment.

EU-enlargement

Section 2.7.1.4.4 described the impacts of subsequent EU-enlargements on the budget for the CAP, the support for produce, the objectives of the Structural Funds etc. This section therefore concentrates on the impacts of the CAP in the new Member States. The entry of these states into the EU has been extensively prepared. Prior to the entry they instituted CAP-like support systems and sought liberalised trade with the EU-15. Regarding RDP the applicants prepared for EU entry by setting up regional authorities for the development of rural development programmes used to implement pre-accession funding via the SAPARD programme. In addition, the PHARE programme financed capacity building, training and technical assistance for the preparation of the Rural Development Plan in each applicant country.

The main effect of EU accession and CAP adoption in the new Member States is expected to derive from market policy and direct payments (AIRDR, 2004). Direct payments are phased-in over a period of 10 years. In 2013 farmers in the new Member States will receive the same level of payments as farmers in the EU-15. From 2007 onward New Member States can benefit from all available RDP measures. The long-term impacts of EU accession may vary considerably in the new Member States. It is expected that the production and consumption of cereals will increase (Asbeek Brusse, 2002). The same is true for pork and poultry production. Beef production and dairy products (except cheese), however, are expected to further decrease.

The expectation is furthermore that small-scale farms, which are not profitable without CAP payments, will continue to produce. Increasing productiveness of other farms, however, may put the incomes of these farmers under pressure. This may start a vicious circle of more poverty, more out-migration, and less support for services in the rural areas in these countries. Although RDP has recently been adapted to the requirements of the new Member States (e.g. various measures are co-financed at a maximum rate of 80%) it is uncertain whether it will be able to break through this vicious circle.

Territorial governance

Regarding the implementation of the Common Agricultural Policy and Regional Policy, there are problems related to territorial governance. This is especially true for the measures aiming at rural development. The reason for this is that the competence of the EU regarding rural development is of subsidiarity nature. The implementation of RDP measures is therefore conditioned directly by the capacity of the national administrations to manage allocated financing and to establish synergies between the various measures. The structure and distribution of the national administrative competences are, however, often badly suited to the integration that the multi-funds approach requires (Robert, 2001).

The proposal from the EC (2004) on the financing of agricultural policy, however, attempts to increase the coherence of RDP and to decrease the administrative burden. The proposed funding encourages a more balanced strategy between competitiveness of the agricultural sector (axis 1), land management for the delivery of environmental services (axis 2), and stimulation of the wider rural economy (axis 3). At the same time the proposal leaves the Member States or regions a high margin of flexibility to emphasize the axis they find most important. The LEADER programme aims at stimulating an integrated approach by financing the implementation of the local development strategy built on the three thematic axes.

Moreover LEADER aims at stimulating capacity building on local level by training, technical assistance etc.

Transport and telecommunications

Transport infrastructure is an import factor for agriculture and rural areas. The improvements achieved during the last centuries regarding transport by road, railway, water, and air have provided an opportunity to produce ever larger markets over ever longer distances (Rienks, et al., 2004). Agricultural products which are not-perishable (by themselves or because of refrigeration), can in principle be transported all over the world at relatively low costs. For perishable products and products requiring many stages of processing, however, fast transport over short distances is still an important factor. Intensive cattle farming, for instance, requires locations close to a seaport for the supply of fodder and a well developed transport infrastructure to the hinterland. And horticulture requires locations close to an airport and close to the market.

Transport infrastructure is also an important factor for the socioeconomic viability of rural areas in general. Economic activities like manufacturing and services depend to a large extent on the accessibility of markets. Tourism and settlement also depend quite a lot on the accessibility of the rural areas. At the same time, however, increased accessibility implies increased competition with producers in other areas. This might be a challenge for rural areas in which agriculture dominates and in rural areas with a variety of activities. For many rural areas accessibility has significantly increased in the last decades because of the improvements in transport. This is especially true for rural areas in urban regions and rural areas attractive for tourism. Yet rural areas with low accessibility face serious problems related to low socioeconomic viability and population density. One of the main obstacles for accessibility of peripheral regions in the CEECs is the poor quality of transport infrastructure in these countries and between these countries and Western Europe. This obstacle has been addressed by the TINA programme.

The improvements that have been and still are brought in the field of ICT enhance the virtual accessibility of rural areas (Smeets et al., 2002). Meanwhile, the impacts of ICT on the settlement of people and business in rural areas are uncertain. It is expected that ICT enables people and business to settle in rural areas which are more remote from urban centres because ICT replaces travelling to a certain extent. But it is uncertain, however, to what extent this will be the case.

2.7.1.6 Summary

In terms of land-use, agriculture occupies by far the largest part of rural areas in Europe. In terms of economic functions, however, the role of agriculture has significantly declined over the past decades. At the same time a number of other economic functions have emerged and developed in rural areas, like industrial, residential, tourist, and leisure functions. As a result rural areas have undergone a process of socioeconomic diversification.

Agriculture has undergone substantial structural changes. Due to intensification and scaling-up of production the number of farms and the rate of employees working in the primary sector decreased and the average farms size and the useful agricultural surface increased. Traditional agricultural holdings with mixed farming and cattle farming moved back to the benefit of specialised holdings. The production of major crops, like cereals, increased. Permanent crops, like vine, and surfaces still in grass, however, decreased. The intensification and scaling-up of production led to large scale arable and dairy farming and more recently to agro-production parks. Niches also exist, however, for experience farming and agrarian nature and landscape management. It is expected that structural changes in the new Member States will go into the same direction but it is uncertain to what extent.

The CAP stimulated the intensification and scaling-up of agricultural production by creating a common agricultural market which was and is protected from the world market and by providing product and income support. The CAP proved to be so successful that within 20 years Europe was able to produce more than enough food for its own population. Exports, however, were rising sharply and surpluses mounting. Moreover, production growth was achieved at the expense of the nature, landscapes and the environment and the distortion of international markets. In reply to that the CAP was and is gradually reformed, e.g. by introducing production quotas, by decoupling payments from production, and by introducing agri-environmental measures and measures for rural development. Despite all reforms the CAP is still a costly endeavour.

Although the CAP was primarily designed to improve the agricultural productivity it has significant territorial impacts. Its impacts vary, however, from region to region. Despite some improvements the CAP reforms haven't changed the orientation towards intensification and scaling-up significantly. The fall in the intervention prices has increased the strength of the market. For this reason, productions of industrial crops strongly increased and intensified and new (industrial and not protected crops) emerged. Pollution by agriculture has been reduced but not stopped and small-scale landscapes are still under pressure. The CAP hasn't stopped the process of territorial dualisation in rural areas either. Market price support benefits richer rural areas more than other rural areas. The same is true for less favoured areas and agri-environmental payments. A number of positive impacts, however, can be observed as well. Agri-environmental actions apply to 20% of the cultivated land and in the 1990s 500,000 ha have been afforested.

Some factors influence agricultural and rural areas and thereby provide specific opportunities and/or threats. New niches in consumers' preferences may provide opportunities for environmentally friendly and healthy production. Alternative income sources, like tourism, manufacturing, and ICT may improve the socioeconomic viability of rural areas. Furthermore, agriculture and rural areas may play a new role in renewable energy production, like the production of bio-fuels and wind energy. Climate change may on the one hand affect the quality and quantity of key crops but on the other hand lengthen growing seasons.

Other factors influence (changes in) the CAP, RDP and Regional Policy. Various interest groups organise coalitions in order to influence policy, e.g. by lobbying for reforms or, on the contrary for the prevention of reforms. Recent animal diseases and food scandals caused large collective investments and had a negative impact on the consumers' confidence in agricultural production. Subsequent EU-enlargements (except the most recent one) caused larger budgets for agricultural and regional policy and also influenced their orientation.

2.7.1.7 Questions to experts

Although the scenario base provides a lot of relevant information for the scenarios presented in part II some information is still missing. Some questions to the members of the external expert panel refer to information (data) about:

1. *indicators for structural agricultural change: income from agriculture and additional income from other activities, production forms, and mechanisation*
2. *development of major crops, permanent crops, surfaces still in grass, woodlands and irrigation in the new Member States*
3. *exact locations of the different farm types in the EU-25*
4. *exact locations of the different types of rural areas*

5. *divisions of payments related to market support and income support by Pillar 1 of the CAP*
6. *actual implementation of measures related to the CAP, RDP and Regional Policy in the EU-25*
7. *exact impacts of CAP, RDP and Regional Policy on different types of landscapes*
8. *expected impacts of the EC's proposal (2004) on the financing of the CAP and RDP*
9. *the dualisation process in the new Member States*

2.7.1.8 Bibliography

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2.7.2 Scenarios

2.7.2.1 Two prospective policy scenarios for the period 2005 – 2030

The historic description of the evolution of rural areas and agricultural production patterns, the CAP and RDP looked more than 25 years into the past. The same is true for the analysis of the factors causing the most relevant policy changes (CAP and RDP reforms) and of the relations with other themes. The two scenarios presented in the following sections look instead 25 years into the future. First 'Open Market' will be presented and, secondly, 'Sustainable Rurality'. Both scenarios are of the prospective policy type, assuming that policy changes will occur and exploring the territorial and other impacts of these changes. For this reason, they may provide important information for decision-makers.

The rationale behind the presentation of 'Open Market' and 'Sustainable Rurality' is that both scenarios explore two alternative policy options which since several years have played an important role in discussions among policy-makers and scientists about the CAP and RDP reforms. Both policy options imply a transition of the agricultural sector from a highly protected and heavily subsidized sector into a liberalized or a sustainable sector⁶. Both scenarios represent two different 'schools' in thinking about EU Policies: the 'liberalization model' versus the 'European model'.

In order to present the policy changes and their expected impacts in a clear way, both scenarios assume the same trends regarding some contextual factors. After the *Second Interim Report* a sensitivity analysis could be carried out in order to explore the impacts of the policy changes under alternative assumptions about these trends.

Regarding global competition and the outcomes of the WTO negotiations it is assumed that the American and European trade blocks are both willing to liberalize the world economy (Van Egmond et al., forthcoming). Most developing countries are positive about liberalization as well, in particular as far as agricultural products are concerned. WTO agreements are made on building more open and competitive global markets and also on *the possibility* to implement criteria for food safety, animal welfare and environmental protection ('non-tradables').

In both scenarios it is assumed that average temperatures in Europe will rise by one degree Celsius until 2030. This projection is the average of the IPCC scenarios (IPCC, 2001). It is expected that global warming has noticeable impacts on the conditions for agricultural production in the scenario period: more droughts and water shortages in southern Europe, more flooding in areas along great rivers, and more summer and winter storms. The mid latitudes and northern Europe can, however, profit from the temperature rise and the growing seasons are lengthened.

EU-enlargements are assumed to be primarily driven by economic (market size, competition) and political (safety, stability) reasons (De Mooij & Tang, 2003). In both scenarios Bulgaria and Romania enter the EU in 2007. The EFTA countries Island, Norway, and Switzerland join in 2015. And after a more or less successful transition, the Balkans, Turkey and the Ukraine enter the EU in 2025. This latest enlargement implies a large extension of agricultural land and rural areas, most of which don't perform economically

⁶ A transition is a structural change of a sector or society as a whole, involving various mutually related developments on different aggregation levels and taking a time span of at least one generation (Rotmans et al, 2003).

well. Significant efforts are assumed to prepare these candidate countries for their entry. Special trade relations are settled with Russia and the African Mediterranean countries.

In both scenarios welfare is assumed to increase on the global as well as on the European level because of the breakthrough of the 'knowledge economy'. This causes an increasing consumption, not only of (agricultural and other) products and services but also of (landscape and other) experiences. Consumption patterns are, however, hardly predictable because they depend to a large extent on new trends and fashions (Diederer et al., 1996). Therefore the first scenario assumes materialistic, diverse, and irregular consumption patterns and the second one in-materialistic, less diverse and more regular patterns.

Concerning demography it is assumed that after a decreasing rise of the total population of Europe there is a fall after 2020. This is caused by a downward trajectory of fertility rates and a further rise of life expectancy. The proportion of Europeans above the age of 65 increases significantly. The age at which full retirement starts rises above 70. The ageing of the population influences settlement and consumption patterns. More wealthy people settle in rural areas and spend a large part of their incomes on housing in a green environment and on travelling.

Finally, it is assumed that the EU will take the Lisbon Strategy seriously in a context of sustained discrepancies between its own economic performance and that of other world economies such as those of the USA and China. The implementation of the strategy differs, however, in both scenarios, the first being focused on economic welfare for Europe in general and the second on the territorial potentials of the various European regions, in line with the conclusions of the Rotterdam Conference of Ministers responsible for territorial cohesion (November 2004).

2.7.2.2 Scenario 'Open market'

2.7.2.2.1 Scenario hypotheses

In this scenario, market forces play an important part in the evolution of rural areas, in particular in the agricultural sector. This obviously results from the outcomes of the WTO negotiations (liberalisation of international markets and reduction of tariff barriers), but is also exacerbated by a deliberate EU-policy aiming at reducing its support to the agricultural sector and to rural development in general, with the exception of fields of activity which contribute to the improvement of competitiveness and growth, such as R&D and technological development. The breakthrough of the 'knowledge economy' on the global scale implies that the European agricultural sector has to cope with the introduction of one product innovation after the other on the international markets, e.g. genetically modified raw materials and food products (Dammers et al., 2003). This is a reason to significantly enhance investments in R&D. Environmental and food safety criteria are only implemented to the extent that they stimulate the competitiveness of the agricultural sector and that this can be done in a cost-effective way. Ecological sustainability is not completely denied but in cases of conflict with economic growth, it is only implemented at a low pace. Rural development is considered to support agriculture and tourism and abolished at last.

2.7.2.2.2 Driving forces

By 2006 the EU was for the fifth year confronted with a low economic growth rate. The mid-term assessment of the Lisbon Strategy had at the end of 2004 revealed that the targets of

European competitiveness could not be reached without a serious reconsideration of the efficiency of EU policies, following in that some conclusions of the Sapir Report published in 2003. The increase of the unemployment rate resulting from the progress of globalisation and in particular from the acceleration of enterprise relocation towards low-wage countries outside Europe was a determining factor for the reconsideration of all EU policies as to their economic efficiency.

A tense debate took place at EU level and within the Member States, in which roughly speaking two policy coalitions were involved. One coalition consisted of members of the EC and the EP, Member States, business groups, and economists wishing to achieve the Lisbon Strategy by the 'liberalization model'. According to this model agriculture should liberalize and rural areas should valorise their 'territorial capital' in order to enhance their competitiveness and economic welfare in general. Another coalition consisted of those members of the EC and the EP, Member States, environmental and third world groups and ecologists wishing to achieve the Lisbon Strategy by the 'European model'. According to this model agriculture and rural areas should develop in a sustainable way along the lines of the Göteborg Strategy of 2001.

After several years of debate the coalition promoting the 'liberalization model' proved to be most influential. At the end of 2008, a decision was made on the EU level that, after the reforms of *Agenda 2000* (1999) and the proposal of the European Commission in 2004, the CAP and RDP would be reformed in a different direction. Market principles would be introduced and income and other payments would be cut down. Agriculture would be treated as any other economic production sector. In order to successfully implement the reforms and to provide agriculture and rural areas the opportunity to adapt to the market conditions this would happen in a gradual way. The same decision was made regarding the Structural Funds.

The 'liberalization coalition' was supported by the fact that in the subsequent WTO negotiations the American trade block and some large exporting countries from the third world put the EU under pressure to liberalize its markets, especially the markets for agricultural products. The coalition used the pressure from these countries as an argument to overcome resistance by opponents in Europe (Kol, 2002). Besides, more and more members of the EC and EP and Member States became convinced that the CAP was too much a burden for the EU budget and that the burden would even become heavier if it wasn't reformed prior to further enlargements of the EU. Furthermore, the agrarian lobby became aware that the sector can only survive in a globalizing economy if it becomes more competitive and demand oriented.

2.7.2.2.3 *The open market strategy*

The reforms of the CAP, Rural Development Policy, and Regional Policy in the 1992-2005 period were only limited to some adaptations of existing policy measures, like a reduction of market price support and an increase in income support, or the introduction of new policy measures, like production quotas and set-aside measures. It was decided, however, that in the 2005-2030 period the policy objectives as well as the policy measures should be fundamentally changed (Griffiths, 2002). By a great number of small steps the agricultural sector was transformed from a highly protected and heavily subsidized sector into an open and competitive (economic!) sector. Liberalisation, deregulation, and freedom to innovate played an important role in this transition process.

The main objectives of the reforms were to reduce the 'excessive' transfers from tax payers to agriculture, to stimulate the application of production factors (land, labour, capital) where they are most productive, to make the agricultural sector more competitive on the world

market and to reduce overproduction and other market distortions (Kol, 2002). Criteria related to food safety, animal welfare, and environmental protection would only be implemented to the extent that they didn't hinder economic competitiveness. In order to be able to fulfil the liberalized market conditions successfully and to provide farmers and other economic actors the opportunity to adapt to these conditions the transition was achieved in a gradual way over a period of one generation. Three reforms can be considered as milestones in the liberalization process.

Reform of 2008

The reform of 2008 marked the beginning of the preparation of the liberalization process. In this phase the process was started by some moderated policy changes. The budget for Pillar 1 didn't change in absolute terms because the heads of state had decided in 2002 to freeze it until 2013. Nevertheless, the reform implied a relative reduction of the budget for commodity market support and direct payments because the accession of Bulgaria and Romania in 2007 implied that it had to be divided among a greater number of farmers. Moreover, it was decided to further shift direct payments from market support to income support. Furthermore, tariffs and export subsidies were gradually reduced to 80%⁷. Regulations in the field of environment, animal welfare etc. (cross-compliance) became voluntary. Measures to stimulate food quality were abandoned because this was considered to be the responsibility of farmers, retailers and consumers.

The budget for Pillar 2 (rural development) was also gradually reduced to 80%. At the same time priorities changed. Most of the budget was spent on the stimulation of the wider rural economy (axis 3), especially on the diversification of economic activities and the improvement of infrastructure (mainly roads and digital networks). Payments were mainly spent to trigger and to facilitate innovative projects, e.g. by organising competitions for project ideas and by providing training programmes. A significant part of the budget was spent on the stimulation of the competitiveness of the agricultural sector (axis 1). These payments worked as accompanying measures to the *reduced* Pillar 1 payments. Payments on land management/environment (axis 2) were significantly reduced because they were considered to be the responsibility of the national and regional governments.

The priority objectives of the Structural Funds related to rural areas were in these years more concentrated on the new Member States. This is true for Objective 1 (promoting the development of and structural adjustment of areas most lagging behind) as well as Objective 2 (supporting the economic and social conversion of areas facing structural difficulties). Like Rural Development Policy triggering innovative projects played an important role. The payments for rural areas were gradually reduced to 90%.

Reform of 2013

Another significant step in the liberalization process was made in 2013. This reform marked the beginning of a period in which the liberalization process was accelerated. For the first time in history it was decided to reduce the budget of the CAP not only in relative but also in absolute terms. In the 2013-2025 period the budget for Pillar 1 (commodity market support and direct payments) was progressively reduced to 25% (!). Concerning the direct payments, market price support was even abolished in this period; only income support remained. Tariffs and export subsidies were further reduced to 20%. Regulations in the field of animal health and animal welfare were abandoned in this period because they were considered to be the responsibility of farmers, retailers and consumers. Environmental measures were reduced to a minimal level.

The budgets for Pillar 2 measures were also further reduced to 20%. From then on they were only applied for economic support of the less favoured areas. Wider rural economy

⁷ All percentages presented in this section are relative to the budget level in 2004.

(axis 3) became further concentrated on diversification of economic activities and on improvement of physical infrastructural (roads) and digital infrastructure (information and communication technology). Competitiveness of agriculture (axis 1) was considered to accompany Pillar 1 measures for the less favoured areas. Land management/environment (axis 2) was further reduced.

In this period the Structural Funds were only applied for restructuring areas most lagging behind or facing structural difficulties *in the new Member States*. The budget for the Structural Funds applied to rural areas was further reduced to 30%.

Reform of 2025

The liberalization process was completed by the reform of 2025. In the period 2026-2030 all Pillar 1 payments (commodity market support and direct payments) were abolished (Van Egmond et al., forthcoming). The same was true for the import tariffs and export subsidies. Pillar 2 measures (rural development) were abolished as well. Stimulation of the wider economy of less favoured areas was from then on considered to be the responsibility of the Member States.

In this period, the Structural Funds were only applied to help rural areas in the *candidate countries* lagging behind or facing structural difficulties to prepare themselves for their entry into the EU. The accession of the Balkan countries, Turkey, and the Ukraine for their entry into the EU played an important role in the maintenance of the Structural Funds. Because of the low price-level in these countries the budget applied to rural areas was further reduced to 20%.

2.7.2.2.4 Impacts of the strategy

Macro economic impacts

The open market strategy generated large macro-economic impacts. The enormous transfers from consumers/taxpayers to agriculture were gradually but certainly stopped. In 1999 these transfers amounted €120 billion (Kol, 2002). In the scenario the reduction of transfers was even larger because the new Member States abolished their protective measures as well. To indicate the welfare impacts for Europe: Gylfason (1995) calculated that the abolishment of all commodity market support measures would generate 3 percent additional economic growth and 4 percent points reduction of unemployment in the EU-12. In the scenario the impacts were smaller in relative terms because of the assumed further enlargement of the EU but in absolute terms they were comparable.

The abolishment of commodity market support also generated large impacts for the developing countries. At the end of the scenario period production factors (land, labour, and capital) were to a great extent applied where they were most productive. This implied that many agricultural products were imported from regions all over the world. Swinbank et al. (1999) calculated that developing countries could generate € 20 billion per year extra welfare if the EU abolished its protective measures, three times the amount of the development aid they receive per year. In the scenario the impact was even larger because the New Member States abolished their import tariffs as well.

Impacts on agriculture

In the last decades of the 20th century agriculture has experienced substantial *structural changes*. After the turn of the century the open market strategy intensified this process. The strategy set a vicious circle in motion. The liberalization of agriculture led to enhanced competition on the world market. This forced European farmers to intensify and scale-up their production. They did this by frequently introducing new technologies (machines), chemicals (fertilizers, herbicides), and genetically modified crops and by buying land from

farmers who didn't survive on a large scale. This led to higher production and as a consequence to rising supply on the world markets, which caused in turn a decline of agricultural prices and thereby enhanced competition.

The vicious circle caused a fall in the number of farms and a substantial rise in the average farm-size. This is especially true in the Central and East European countries (CEECs) and later in Turkey, where small scale farming rapidly vanished. Not very long after the CAP reform of 2013, when liberalization was accelerated, small farms no longer dominated. In 2000, the average physical farm-size (Utilised Agricultural Area) in the EU-15 was approximately 20 ha. In 2030, when the liberalization was achieved, the UAA was almost quadrupled. In the 1990s the economic size of the holdings (Standard Gross Margins) rose throughout the EU-15. Because of the increased competitiveness in the scenario period the SGM rose even more.

The liberalisation of the agricultural markets caused a further concentration and scaling-up of *large-scale agriculture* (arable and dairy farming). These farmers were forced to use their production means in the most efficient way (De Bont et al., 1999). Large-scale arable and dairy farming decreased therefore in Northwest Europe and also in South Europe but increased in most of the CEECs and Turkey where land-prices and wages were much lower.

Intensive cattle farming and horticulture profited from the highly developed infrastructure in urbanized regions of Northwest Europe. This enabled them to efficiently produce for the world market. Further scaling-up and clustering of farms and hothouses reduced production costs (energy, waste, transport). Large-scale dairy farming, intensive cattle farming and horticulture became even more competitive on the world market than they already were. Arable farming, however, lost market shares.

The same is true for both other farm types. An impact of the liberalization was that *experience farming* never really broke-through. It became only competitive on a small scale by providing attractions, especially for urban people. Only a small number of farmers were able to do this in a professionalized and commercialised way.

The liberalisation of agriculture only left some possibilities for agrarian *nature and landscape management* where national or regional governments or NGOs were willing to pay because Rural Development Policy was gradually abolished. Moreover, increased competition made it difficult to combine efficient agricultural production with nature and landscape management.

In 1995 among the 130 million ha of agricultural land in the EU-15, more than 50% were occupied by arable land, more than 35% by surfaces still in grass and less than 10% by permanent crops. Agriculture had developed on the most productive land while giving up certain less-favoured areas (mountains, foothills) and also many parts, among which high quality arable land, to urbanisation. This process significantly intensified during the scenario period. Moreover, the surface of agricultural land decreased in the EU-15 because in urbanized regions land-prices rose significantly. In the CEECs and Turkey the surface, however, increased because land-prices were low and many natural areas were cultivated.

The production of *major crops* continued growing. The introduction of new farming technologies, chemicals and genetically modified crops made it possible to increase production quickly. Cereals, dry vegetables, and industrial crops offered relatively high gross products per hectare. The same was true for fodder crops and energetic crops as the demand for renewable energy (biomass and bio-fuels) increased because of the rapid increase of world oil prices. Large parts of the surfaces still in grass were changed into arable land and many crops were cultivated in monocultures.

Permanent crops decreased more rapidly than they did before. Ordinary wine production was significantly decreased because of increasing competition of wines from other regions in the world. Production of high quality wines in name areas, however, increased because they were more and more preferred by wealthy consumers. Orchard surfaces further decreased in northern Europe but increased in southern Europe and in Turkey because of the introduction of better irrigation techniques and genetically modified trees.

Surfaces still in grass further decreased. Dairy farming, it is true, was successful on the world market but many surfaces still in grass were changed into arable land in order to grow fodder crops. The reason for this change was that it further reduced production costs.

In the 1990s *woodlands*, which covered more than 30% of the EU-15 territory in 1997, increased slightly. The main reason were the EU measures for afforestation (500,000 ha in these years) and the abandonment of agricultural land, which led in some areas to natural afforestation. After the turn of the century, however, this trend was reversed. And after 2013, when Pillar 2 measures were significantly reduced, afforestation was almost completely stopped. Only a few national and regional governments and NGOs continued to invest in nature development. Moreover, many natural areas were cultivated. In the CEECS this happened even to a larger extent than in the EU-15.

During the scenario period there was a clear rising trend of *irrigable surfaces* in Europe, although tendencies differed substantially among the Member States⁸. Various annual and permanent crops were irrigated in order to increase the yields. The rising trend was further stimulated by the increasing frequency of droughts and heat waves, especially in South Europe, caused by the climate change.

Impacts on rural areas

The open market strategy did not only have large impacts on agriculture but also on rural areas. *Rural areas in urbanized regions* benefited from the growth of the residential areas, industrial estates, the culture industry etc. At the same time they were affected by increasing population (of families) and urbanisation. Socioeconomic viability was further enhanced. The intensification of agriculture caused serious pollution and damage to the landscape. More extensive forms of agriculture decreased significantly because of continuing urbanisation and increasing land-prices.

The socioeconomic viability of *rural areas attractive for tourism* also increased significantly. Mass-tourism became booming business. Particularly in coastal and mountain areas local recourses were commodified and marketed. In many areas tourist and commercial infrastructure was significantly extended. This had large negative impacts on nature, landscape and environment, especially in high seasons.

Rural areas with a variety of activities developed in different directions. Diversified agriculture hardly survived. Some areas, however, were successful in strengthening their socioeconomic viability by building luxury houses for wealthy retired people, developing a services industry or building 'invented traditions', like 'shopping castles'. These areas were successful in marketing their identity or creating a new one. Areas which were less successful saw their socioeconomic viability going down.

Rural areas where agriculture dominates also developed in different directions. Areas in which agriculture already had a strong production structure became even more productive because of further industrialization of production. Socioeconomic viability and population growth increased in these areas because the processing industry was successful as well. Nature, environment and landscape, however, were put under high pressure. Areas in which

⁸ Irrigation is regarded as an indicator of the intensification in agricultural production.

agriculture had a weak production structure developed in the opposite direction. In these areas socioeconomic viability further decreased, depopulation intensified, and large surfaces of agricultural land were abandoned, especially less productive areas.

Rural areas with low accessibility were also faced with an intensified downward spiral. The liberalization process stimulated a further marginalization of agriculture. Regional actors were not successful in commodifying and marketing local resources, like nature and landscapes or in improving infrastructure. Younger people, searching for jobs, out-migrated. This caused an ageing of the population, which was in some areas even enhanced by the in-migration of retired people.

Territorial and other impacts

The open market strategy led to a strong reduction of territorial, economic, and social cohesion. The increased working of the market forces and the abolishment of measures stimulating small-scale farming, extensive farming and rural development caused a substantial further increase of the dualisation of agriculture and rural areas. The strategy generated outspoken 'winners' and 'losers'. This was only limited to some extent by the fact that market price support and other CAP measures benefiting richer areas most were also abolished

The progressive abolishment of CAP measures significantly increased the strength of the market. This had at least two consequences. First, productions with industrial purpose, like colza and sunflowers, strongly increased. This was enhanced by the demand for biomass production. Second, new crops which proved to be competitive on the international markets, like genetically modified cereals, vegetables, and flowers were introduced.

The strengthening of the market caused almost a disappearance of over-production. After 2013 over-production was rapidly corrected without any government intervention. The disappearance of set-aside land led to an increase of exploited surfaces. In the CEECs and Turkey, yields increased significantly, not only absolutely but also relatively to the EU-15 average. The gradual abolishment of direct payments and agro-environmental measures led to a large abandonment of farmland, especially in the less favoured areas.

Under the increasing discipline of the market the dualisation of agricultural production systems was significantly further enhanced. On the one hand production concentrated and intensified in the most fertile areas of the EU-15 and the new Member States and on the other hand agricultural abandonment of farmland substantially further progressed in the less favoured areas.

The increased agricultural productivity generated significantly higher levels of pollution. Crop production was intensified by the increased use of nutrients, pesticides, and irrigation. This tendency was, however, limited to a certain extent by the introduction of genetically modified crops and new production techniques. The intensification of livestock-farming caused increased production of manure and emissions of ammonium. This was further enhanced by the abolishment of cross-compliance principle.

The increased productivity had also large impacts on landscapes. Intensification occurred most of all in open fields, polders and deltas close to urban areas. Industrialised arable and dairy farming caused large damage to landscapes and environment in these areas. The scaling-up of production also occurred in the open fields. Most of the bocage landscapes were changed into open fields. In areas like low and high mountains the large abandonment of farmland led to high risks of erosion and mud-floods.

2.7.2.2.5 Final territorial image

In 2030, after the transition of the agricultural sector the image of the EU is quite different from that in 2005. The Union has been substantially enlarged. Its borders have been shifted a long way to the East, Russia, Syria, and Iran now being the new neighbour states. The entry of Bulgaria, Romania in 2007 and especially the entry of Ukraine and Turkey in 2025 have significantly extended the surface of agricultural land. Agriculture is characterized by a high measure of dualisation. Large-scale arable and dairy farming decreased in Northwest Europe but increased more in the CEECs and Turkey because agricultural conditions in terms of land-prices and wages are much better there. Intensification and scaling-up of production has led to large-scale dairy and arable farms in these countries. Intensive cattle farming and horticulture are concentrated in Northwest Europe because the highly urbanized character of this region and the highly developed infrastructure enable them to efficiently produce for the world market. Experience farming occurs only on a small scale in urbanized regions. And nature and landscape management by farmers has almost completely disappeared.

Rural areas are characterized by a very high measure of dualisation as well. Most of the rural areas in urbanized regions have become urbanized themselves. This means that many rural areas where agriculture dominates have changed into rural areas in urbanized regions. Rural areas attractive for tourism have extended significantly. The enlargement of the EU has created many opportunities to exploit new coastal areas, like the Black Sea coast, and mountain areas, like the Carpathian and Balkan mountains, for mass-tourism. The intense dualisation of agriculture and rural areas has become most clearly visible in rural areas where agriculture dominates. Most of these areas are dominated by large-scale industrialised farms. These areas are densely populated and socio-economically viable. Other areas, however, are characterized now by large surfaces of abandoned farmland, many of which are now eroded or naturally forested. The same is true for rural areas with low accessibility, like the Northern parts of the Nordic countries. Socioeconomic viability and population density in these areas are very low. In the Central and East European countries many natural areas have been exploited by forestry or changed into farmland.

2.7.2.2.6 Summary

After being confronted for several years with a low economic growth rate the EU decided that the Lisbon Strategy could not be achieved without a serious reconsideration of the efficiency of EU policies. In a tense debate the policy-coalition promoting the open market strategy proved to be most influential. This coalition was supported by the WTO negotiations, the fact that the CAP was felt too much a burden for the EU budget and the awareness of the agrarian lobby that the sector should become more competitive on the world market.

The open market strategy transformed the agricultural sector gradually but certainly into an open and competitive economic sector. This happened in three stages: a preparation stage, an acceleration stage, and a realisation stage. During the implementation Pillar 1 and Pillar 2 measures were first gradually reduced but finally completely abolished. In order to implement the process successfully and to provide farmers and rural areas the opportunity to adapt to the free market the implementation was stretched-out over a period of 25 years.

The liberalization of agriculture had substantial impacts on general welfare. It stopped the large transfers from consumers/taxpayers to the agricultural sector and generated more economic growth in Europe and in the developing countries. With regard to agriculture and

rural areas, however, a process of intensive dualisation took place. The number of farms fell but the average size rose substantially. Large-scale arable and dairy farming decreased in Northwest Europe but increased more in Central and East Europe and Turkey. Like intensive cattle farming and horticulture they were very successful on the world market. Experience farming and agricultural nature and landscape management, however, hardly survived. Rural areas in urbanized regions, which were attractive for tourism or in which agriculture dominated were very successful in terms of socioeconomic viability and also became more populated, but rural areas with a variety of activities or with low accessibility were faced with a downward spiral. Furthermore, the intensification and scaling-up of agricultural production and the booming of mass-tourism caused severe damage to nature, landscapes and the environment.

2.7.2.3 Scenario 'Sustainable Rurality'

2.7.2.3.1 Scenario hypotheses

In order to stimulate the transformation of the enlarged internal market into a 'sustainable economy' market, competition as well as environmental conditions and territorial cohesion are stimulated. The EU gives priority to a further integration of sectoral policies, like agricultural, regional, environmental and structural policies. Spatial development policies play an important part as a reference for the integration and coordination policies in rural areas. This takes the shape of a sophisticated system of cooperation between different policy domains. The CAP and RDP are reformed in an economically, socially and ecologically sustainable way. Criteria for food safety, animal welfare and environmental protection are respected. Where possible, farmers are enabled to implement these 'quality criteria' in a cost-effective way, but in cases of conflict with economic growth, priority is given to these criteria. The reason for this is that the EU considers ecological and social sustainability as preconditions for economic sustainability. In the same way, rural development is considered to support the economic competitiveness of rural areas but also job creation, social cohesion in rural areas and the quality of the environment. To this end, the economic diversification of rural areas is actively promoted.

2.7.2.3.2 Driving forces

By 2006 the EU was for the fifth year confronted with a low economic growth rate. The mid-term assessment of the Lisbon Strategy in 2004 revealed that the targets of European competitiveness could not be reached without a serious reconsideration of the efficiency of all EU policies. The increase of unemployment resulting from further globalisation and in particular from enterprise relocation towards low-wage countries outside Europe was a determining factor for the reconsideration.

A tense debate took place at EU level and within the Member States, in which two policy coalitions dominated. One coalition consisted of those actors wishing to achieve the objective of the Lisbon Strategy by the 'European model'. According to this model agriculture and rural areas should develop in a sustainable way along the lines of the Göteborg Strategy of 2001. Another coalition consisted of actors wishing to achieve the Lisbon Strategy by the 'liberalization model'. According to this model agriculture should liberalize and rural areas should valorise their 'territorial capital' in order to enhance their competitiveness and economic welfare in general.

The coalition promoting the 'European model' proved to be most influential. At the end of 2008, a decision was made on the EU level that the reforms of *Agenda 2000* (1999) and the proposal of the European Commission in 2004 were considered as first steps in the direction of a more fundamental reform of the CAP and RDP in a sustainable direction. Social and ecological sustainability were considered as preconditions for economic sustainability. More market principles would be introduced in the agricultural sector but in a framework of regulations for environmental protection and social security. In order to successfully implement the reform and to provide agriculture and rural areas the opportunity to adapt to the new conditions this would happen in a gradual way. The same decision was made regarding the Structural Funds.

The 'sustainability coalition' was supported by the growing awareness of the environment. Incidents like more frequent droughts and heat waves in South Europe, excessive rainfalls and floods in Northwest and East Europe, and retreating glaciers in the mountains convinced more and more people that the climate was changing. This made clear that the environment should be considered as a precondition for economic and other human activities. Besides, after the enlargement of 2004 the EU faced a great challenge regarding cohesion. At the time of their entry the new Member States were at only 40% of the average GDP of the EU-15 and Bulgaria and Romania were at that moment even at less than 30%. Furthermore, in the subsequent WTO negotiations the EU was put under increasing pressure by the American trade block and some large exporting countries from the third world to liberalize its markets, especially its markets for agricultural products.

2.7.2.3.3 *The sustainable rurality strategy*

The reforms of the CAP, Rural Development Policy, and Regional Policy in the 1992-2005 period were limited to some adaptations of existing policy measures, like a reduction of market price support and an increase of income support, or the introduction of new policy measures, like production quotas and set-aside measures. It was decided, however, that in the 2005-2030 period the policy objectives as well as the policy measures should be fundamentally changed. In subsequent steps the agricultural sector would be transformed from a largely protected sector putting nature, landscapes and the environment under pressure into a sustainable economic sector. Liberalisation within a framework of regulations ('licence to produce') and freedom to innovate within certain limits played an important role in this transition process (Dammers et al., 2003).

The main objectives of the reforms were to make agriculture and rural areas sustainable, to improve the quality and quantity of characteristic European nature and landscapes, to make the agricultural sector more competitive on the world market, and to reduce the huge transfers from consumers/tax payers to agriculture. In cases of conflict between economic growth and the implementation of criteria related to food safety, animal welfare, and environmental protection, priority would be given to these 'quality criteria'. In order to achieve the 'transition towards sustainability' successfully and to provide farmers and rural areas the opportunity to adapt to the new conditions the transition took place in a gradual way over a period of one generation. The following reforms were milestones in the transition process.

Reform of 2008

The aim of the reform of 2008 was to further prepare the transition process. In this phase some policy changes were implemented in the direction of liberalization within a framework of regulations. Budgets were further transferred from Pillar 1 to Pillar 2 (modulation). The budget for Pillar 1 (commodity market support and direct payments) didn't change in absolute terms because the heads of state had decided in 2002 to freeze it until 2013. The reform implied, however, a relative reduction of the budget because the entry of Bulgaria

and Romania in 2007 implied that it had to be divided among a greater number of farmers. Besides, it was decided to further shift the direct payments from market support to income support. Furthermore, import tariffs and export subsidies were reduced to 90%.⁹ The regulations in the field of environment, animal welfare, animal health, and food quality (cross-compliance) became compulsory for all Member States. Subsidies were enhanced to 150%.

The budget for Pillar 2 (rural development) was also gradually increased to 150%. At the same time priorities changed. Most of the budget was spent on the stimulation of the wider rural economy (axis 3), especially on the diversification of economic activities by *maintaining* the attractiveness of rural areas and cultural heritage. Co-ordination between public authorities was stimulated by subsidizing rural development perspectives; co-operation between public authorities, NGOs, and business became conditional for payments. A significant part of the budget was spent on land management/environment (axis 2), which was also concentrated on *maintaining* nature and landscape and preventing the abandonment of farmland. Competitiveness of agriculture (axis 1) was concentrated on increasing competitiveness of the sector, *respecting* criteria for animal welfare, environmental protection etc.

The budget for the Structural Funds related to rural areas was also increased to 150%. The priority objectives were concentrated on the *improvement* of economic, social and territorial cohesion, especially in the new Member States. This is true for Objective 1 (promoting the development of and structural adjustment of areas most lagging behind) as well as Objective 2 (supporting the economic and social conversion of areas facing structural difficulties). Regional Policy, like Rural Development Policy, was also aimed at stimulating co-ordination and co-operation among actors.

Reform of 2013

The reform of 2013 marked the beginning of a period in which the 'transition towards sustainability' was accelerated. Budgets were significantly further transferred from Pillar 1 to Pillar 2. For the first time in history it was decided to reduce the budget of the CAP not only in relative but also in absolute terms. In the 2013-2025 period the budget for Pillar 1 (commodity market support and direct payments) was gradually reduced to 60%. Concerning direct payments, market support was even abolished in this period; only income support remained. Import tariffs and export subsidies were also further reduced to 60%. Criteria for environmental protection, animal health, animal welfare, and food quality were increased. The same was true for the subsidies, which reached a level of 250%.

The budgets for Pillar 2 measures (now defined 'integrated rural development') were also further increased to 250%. A sophisticated system of co-ordination and co-operation on the regional level was introduced. This system consisted of integrated rural development perspectives, made by regional innovation networks, facilitated by regional knowledge centres, and implemented with the aid of regional development funds (Smeets & Blom, 2002). Wider rural economy (axis 3) was concentrated on diversification of economic activities by *improving* the attractiveness of rural areas and cultural heritage. Land management / environment (axis 2) was concentrated on *improving* nature and landscape and preventing the abandonment of farmland. Competitiveness of agriculture (axis 1) was concentrated on increasing competitiveness of agricultural, *respecting higher* criteria for animal welfare, environmental protection etc.

Regional Policy was gradually integrated with Rural Development Policy. The budgets for the Structural Funds related to rural areas were further increased to 250% and combined with

⁹ All percentages presented in this section are relative to the budget level in 2004.

the budgets for Pillar 2. The payments aimed at *further improving* economic, social and territorial cohesion in the new Member States.

Reform of 2025

The 'transition towards sustainability' was completed by the reform of 2025. In the period 2026-2030 Pillar 1 payments (commodity market support and direct payments) were reduced to 30%. The same was true for the import tariffs and export subsidies. Further reduction was avoided in order to be able to cope with the irregularities characteristic for the agricultural sector (Griffiths, 2002). This was considered necessary because of the climate change and its impacts on weather conditions (droughts, floods). Concerning the direct payments income support was maintained for farmers in less favourable areas in order to guarantee a level playing field and to prevent the abandonment of farmland in these areas. Subsidies in the field of environment, animal health, animal welfare, and food quality were further increased to 300%.

Budgets for Rural Development Policy (Pillar 2) and Regional Policy were also further increased to 300%. The system of co-ordination and co-operation on the regional level was further improved by stimulating the ambitions during the making and implementing of integrated rural development schemes. Mutually learning by working visits and round-table meetings and facilitating by so-called flying brigades (teams helping to tackle bottlenecks in the process) played an important role (Dammers et al., 2004). The priorities of the three thematic axes of RDP were maintained.

2.7.2.3.4 Impacts of the strategy

Macro economic impacts

The sustainable rurality strategy generated large macro-economic impacts but not as large as the open market strategy. The huge transfers from consumers/taxpayers to agriculture were significantly reduced (to a level of 30% compared to 2004) but not stopped. According to Kol (2002) these transfers amounted to €120 billion in 1999. If in that year the strategy was implemented at once, transfers of approximately €85 billion would have been avoided. In the scenario the reduction is, however, larger because the new Member States abolished their protective measures as well. For the same reason the welfare impacts for Europe in the scenario are also less than the 3 percent additional economic growth and the 4 percent points reduction of unemployment in the EU-12 if commodity market support was completely abolished (compare Gylfason, 1995).

The same is true for the impacts on the developing countries. At the end of the scenario period production factors (land, labour, and capital) were to a great extent applied where they were most productive, but not to the same extent as in the open market scenario. Many agricultural products were imported from regions all over the world. According to Swinbank et al. (1999) developing countries could generate € 20 billion per year extra welfare if the EU abolished its protective measures. In the scenario the impact was even larger because the New Member States abolished their import tariffs as well. If in that year the strategy had been implemented at once, developing countries would have gained approximately € 15 billion per year.

Impacts on agriculture

The *structural changes* of the agricultural sector, which occurred in the last decades of the 20th century, were intensified by the sustainable rurality strategy, but not so much as by the open market strategy. The vicious circle moved not so quickly because European agriculture was not completely left to the mercy of the world market (compare section 2.7.2.2.4). Nevertheless, the number of farms decreased and the average farm-size increased significantly. This is especially true in the CEECs and later in Turkey, where small scale

farming was gradually reduced. Although small farms no longer dominated, many of them survived, e.g. by alternative income resources. In 2000, the average physical farm-size (Utilised Agricultural Area) in the EU-15 was approximately 20 ha. In 2030, when the transformation was achieved, the UAA was almost tripled. In the 1990s the economic size of the holdings (Standard Gross Margins) rose throughout the EU-15. Because of the increased competitiveness in the scenario period the SGM rose even more.

The liberalisation of the agricultural markets caused a moderated concentration and scaling-up of *large-scale agriculture*. Part of arable farming moved out of Europe because production was cheaper in other regions of the world (compare Van Egmond et al., forthcoming). Dairy farming increased, however, because milk-quotas were abolished. Arable and dairy farming increased most of all in rural areas with relatively low land-prices, e.g. in Poland, the Baltic States, and the Ukraine. In Northwest and South Europe both types of farming decreased.

Intensive cattle farming and horticulture, located in urbanized regions of Northwest Europe with highly developed infrastructure, produced efficiently for the world market. The introduction of a kerosene tax, however, set limits to the growth of horticulture. Many intensive cattle farms and hothouses settled on *agro-production parks*. Scaling-up and clustering reduced production costs and provided possibilities for recycling manure, waste etc. Regulations for animal welfare limited further intensification.

Experience farming broke through, especially in urbanized regions and in rural areas with small-scale landscapes. Consumers' preferences for organic products and regional quality products increased. The same was true for services provided by farmers, like camp-sites and training facilities. They were willing to pay extra for the experience of being in a 'natural environment' and have contacts with animals. By co-operating, farmers were able to specialise and professionalize themselves (Van Eck et al., 2002).

The growing demand in society for cultural landscapes provided opportunities for agrarian *nature and landscape management*. The gap between efficient agricultural production and landscape management was bridged by the increased payments for agri-environmental farming, farm forestry etc., provided not only by the (generalized) direct payments and RDP but also by national and regional governments. Co-operation among farmers enabled them to set up large networks and to manage them in a professional way.

In 1995 agriculture (130 million ha in the EU-15) had developed on the most productive land while giving up certain less-favoured areas (mountains, foothills) and also some parts, among which high quality arable land, to urbanisation. During the scenario period the surface of agricultural land decreased to a certain extent in the EU-15 because in urbanized regions land-prices rose. In East Europe and especially in Turkey the surface, however, increased because land-prices were low and 'waste land' was cultivated.

The production of *major crops* increased moderately. New farming technologies and chemicals made it possible to increase production, without excessive pollution. Cereals, dry vegetables, and industrial crops offered relatively high gross products per hectare. The same was true for fodder crops and energetic crops as the demand for renewable energy increased because of the rapid increase of world oil prices. Several genetically modified energy crops were introduced. Large parts of the surfaces still in grass were changed into arable land. Monocultures decreased, however, by rotation and diversification of crops and by development of large landscape elements.

Permanent crops decreased at a slower pace than they did before. Ordinary wine production decreased because of intensified competition of wines from other regions in the world. Production of quality wines, however, increased because they were more demanded by

consumers. Orchard surfaces decreased in Northwest and East Europe but increased in South Europe and in Turkey because of the introduction of better irrigation techniques. To some extent orchards were cultivated for experience farming. Organic fruit found more solid niches in the market.

Surfaces still in grass decreased but at a lower pace than in the first scenario. Dairy farming, it is true, was successful on the world market but many surfaces still in grass were changed into arable land in order to grow fodder crops. Besides, more surface of land was used for energy crops.

Agri-environmental and forestation programmes stimulated a substantial extension of woodlands. This is especially true for the 2014-2025 period, when the RDP budget was progressively increased. Afforestation was, however, not only subsidised by the EU but also by national and regional governments. The reason for this was that woodlands provided an opportunity to sink CO₂, to provide biomass, and to prevent erosion and mud-floods in mountainous areas.

During the scenario period there was a slight further rise of *irrigable surfaces* in Europe.¹⁰ Irrigation became, however, submitted to severe environmental criteria in order to prevent water shortages and de-hydration of natural areas and limit losses of nutrients and pesticides in the environment. In many regions, especially in South Europe, this required a transition of water-management, including measures for water-saving, building water-basins, etc. This became even more important when the frequency of droughts and heat waves increased because of the climate change.

Impacts on rural areas

The sustainable rurality strategy did not only have impacts on agriculture but also on rural areas. *Rural areas in urbanized regions* benefited from the further growth of residential areas, industrial estates, cultural amenities etc. At the same time they were affected by further population, especially of households with children, and urbanisation. Large-scale arable and dairy farming decreased. East Europe. Intensive cattle-farming and hothouses concentrated on agro-production parks. Experience farming increased because of growing demand for regional quality products and services provided by farmers. Socioeconomic viability further increased.

The socioeconomic viability of *rural areas attractive for tourism* also increased. Outdoor recreation and tourism flourished, not only in coastal and mountain areas but also in areas with small-scale landscapes, like 'bocages' and 'montados'. These areas also re-populated, especially by (relatively wealthy) young pensioners (Vandermotten et al., 2004). Aided by RDP and SF payments local actors improved nature, landscapes, and cultural heritage. This generated in turn better local recourses to be commodified and marketed. Frameworks of regulations limited pressure on nature, landscape and environment to a large extent.

Rural areas with a variety of activities diversified their economic basis. Supported by RDP and SF measures experience farming and agricultural nature and landscape management increased, especially in areas where small-scale landscapes could be developed. Stimulated by integrated rural development other economic activities, like services, manufacturing, and ICT developed as well. Regional innovation networks played an important role in finding new directions of diversifying the economy. They were especially successful in attracting dynamic small scale enterprises. On a limited scale houses in green environments were built for more wealthy people. This attracted households with young children and young pensioners and thereby further stimulated socioeconomic viability.

¹⁰ Irrigation is regarded as an indicator of the intensification in agricultural production.

Rural areas where agriculture dominates also diversified. Most areas in which agriculture already had a strong production structure became even more productive because of further intensification and scaling-up of production. Socioeconomic viability increased because the processing industry was successful as well. Frameworks of regulation prevented excessive pressure on nature, environment and landscape. In many rural areas in which agriculture traditionally had a weak production structure, the maintenance of (substantially reduced) direct payments enabled the sector to survive. Moreover, these rural areas, supported by RDP and SF payments, diversified their economic basis. In these areas socioeconomic viability increased. Farmland became abandoned to some extent. Most of this land was used for afforestation and other forms of nature development.

Several *rural areas with low accessibility* were successful in commodifying and marketing local resources. This was especially true for rural areas with large-scale and characteristic natural areas, e.g. primeval forests. Supported by RDP and SF payments, professional tour operators developed luxurious forms of nature-tourism (wolf and bear spotting) together with the necessary tourist infrastructure. Frameworks of regulations limited pressure on these natural areas. These areas improved their socioeconomic viability and attracted some families with children. Other rural areas with low accessibility, however, were facing a negative spiral.

Territorial and other impacts

The sustainable rurality strategy stimulated territorial, economic, and social cohesion. The dualisation of agriculture and rural areas, which dominated in the last decades of the 20th century, was noticeably weakened after the turn of the century. In the 2014-2025 period, when the transition process was accelerated, this tendency was even turned into a tendency of enhanced cohesion. The principle of liberalization within a framework of regulation proved to be successful to a great extent. This was especially true for of measures stimulating diversification of farming and of the rural economy in general.

The reduction of Pillar 1 (commodity market support and direct payments) and the enhancement of Pillar 2 (rural development measures) caused a strengthening of the market but also of nature, landscapes, and the environment. As a consequence, the production of classic cash crop products, like cereals and sugar beets, decreased. Regional quality products and organic products, however, extended their share in the world market. The same is true for energy crops. The introduction of new products on the market was limited.

The liberalization of the market within the framework of regulations caused a significant reduction of over-production. After 2013 correction of over-production required only limited government intervention. In the CEECs and also in Turkey yields increased significantly, not only absolutely but also relatively to the EU-15 average. The abandonment of farmland, caused by the reduction of Pillar 1 payments was, limited by agri-environmental and forestation payments.

The dualisation of agricultural production systems was limited in the 2008 – 2013 period and even reduced in the 2014 – 2025 period. Production, it is true, concentrated and intensified moderately in the most fertile areas of the EU-15 and the new Member States but in other rural areas agricultural and other economic activities significantly diversified. In less favoured areas some agricultural activities could be maintained, due to the (generalized) direct payments and abandonment of farmland noticeably decreased in these areas.

In this scenario increased agricultural productivity was combined with reduced environmental pollution. The introduction of new techniques and chemicals and the increase of organic farming played an important role in the decreasing use of nutrients and

pesticides. The recycling of manure and waste in agro-production parks reduced pollution as well. Compulsory cross-compliance and subsequent enhancement of agri-environmental payments further stimulated this tendency. The transition of water-management was helpful to reduce de-hydration of natural areas.

Increased productivity was also combined with the improvement and development of landscapes. In open fields, polders and deltas close to urban areas, where intensification dominated, farmers were paid to develop large scale landscape elements. Industrialised arable and dairy farming was to a large extent concentrated on the agro-production parks, which were also embellished with landscape elements. Many bocages and other small-scale landscapes were restored. Afforestation of abandoned farmland in low and high mountains reduced the risks of erosion and mud-floods.

2.7.2.3.5 Final territorial image

In 2030, after the transition of the agricultural sector, the image of the EU is quite different from that in 2005. The EU has been substantially enlarged. Its borders have been shifted a long way to the East. The entry of Bulgaria, Romania in 2007 and especially the entry of Ukraine and Turkey in 2025 have significantly extended the surface of agricultural land. Arable and dairy farming have increased in these countries because agricultural conditions in terms of land-prices and wages are better. In Northwest and South Europe, however, both types of farming have decreased. Many large scale farms have developed here. Intensive cattle farming and horticulture are concentrated in agro-production parks in Northwest Europe because the highly urbanized character of this region and the highly developed infrastructure enable them to efficiently produce for the world market. Experience farming takes place in urbanized regions and in small-scale landscapes. Nature and landscape management by farmers is also found in small-scale landscapes.

Many rural areas in urbanized regions have become urbanized themselves, but not so many as in the first scenario. Some rural areas where agriculture dominates have changed in their turn into rural areas in urbanized regions. Rural areas attractive for tourism have extended moderately. The enlargement of the EU has created new opportunities to develop tourism and outdoor recreation in coastal areas, like the Danube delta, but also in small-scale landscapes, like Bohemia. The dualisation of agriculture and rural areas has noticeably been reduced. Although the most fertile areas in Europe are dominated by large-scale dairy farming and to a lesser extent by arable farming, both farm types are not as dominant as in the first scenario. Abandoned farmland also occurs to a much lesser extent. Various rural areas with low accessibility, like the North of the Nordic countries or the East of Poland, are preserved for luxurious forms of nature-tourism. In the Central and East European countries only a very limited surface of natural areas have been exploited by forestry or changed into farmland.

2.7.2.3.6 Summary

After being confronted for several years with a low economic growth rate the EU decided that the Lisbon Strategy could not be realized without a serious reconsideration of the efficiency of EU policies. In a tense debate the policy-coalition promoting the sustainable rurality strategy proved to be most influential. This coalition was supported by the growing awareness of the environment (which was in its turn stimulated by several incidents related to climate change), the fact that the EU after the enlargement of 2004 faced a great challenge regarding cohesion, and the increasing pressure of the WTO to liberalize the markets for agricultural products.

The sustainable rurality strategy transformed the agricultural sector to a large extent into a sustainable economic sector. This happened in three stages: a preparation stage, an acceleration stage, and an implementation stage. During the implementation Pillar 1 measures (commodity market support and direct payments) were significantly reduced but at the same time Pillar 2 measures (now defined as 'integrated rural development') were strongly enhanced. In order to implement the transformation successfully and to provide farmers and rural areas the opportunity to adapt to the new conditions implementation was stretched-out over a period of a generation.

The sustainable rurality strategy had large impacts on general welfare but not as large as the liberalization strategy. It reduced the large transfers from consumers/taxpayers to the agricultural sector and generated more economic growth in Europe and in the developing countries. With regard to agriculture and rural areas dualisation was reduced and cohesion was enhanced. The number of farms decreased but the average size rose. Many large-scale dairy and arable farms moved to Central and East Europe. Dairy farming and intensive cattle farming were successful on the world market. Experience farming and agricultural nature and landscape management were successful on regional markets. Arable farming, however, lost market shares. Rural areas in urbanized regions, which were attractive for tourism or in which agriculture dominated experienced increasing socioeconomic viability and further population growth. The same is true for many rural areas with a variety of activities and to a lesser extent for some rural areas with low accessibility. Intensification and scaling-up of agricultural production were combined with development of nature and landscapes and reduction of pollution.

2.7.2.4 Main issues

The open market strategy and the sustainable rurality strategy generate various issues for policy-makers on the EU-level and other levels. This section describes some issues together with their relations with the policy-options mentioned in the ESDP (between brackets). Most issues are related to both scenarios although not to the same extent:

- Mobilisation of the local recourses ('territorial capital') of the various rural areas in Europe.
- Promoting diversified development strategies sensitive to the local potentials of rural areas (13, 21).
- Promoting and supporting information exchange between rural areas in the enlarged EU (16).
- Exploitation of the development potential of tourism in rural areas (18).
- Preventing downward spirals in rural areas with low socioeconomic viability.
- Commodifying and marketing of cultural landscape and other local qualities of rural areas (53).
- Guaranteeing a minimum acceptable level of environmental protection in rural areas (14).
- *Preventing the dissemination of genetically modified plants and seeds.*
- Preventing abandonment of farmland or using it in other productive ways.

2.7.2.5 Questions to experts

Both scenarios are based on an analysis of existing scenario reports and other publications about agriculture and rural development. The further elaboration of the scenarios, especially of the territorial impacts of the open market and sustainable rurality strategy, requires a lot

of extra information and also the comments of the external expert panel. Important questions to the external experts are:

- 1. What amounts of cereals, meat, vegetables and other products could the enlarged EU produce under the conditions of the 'Open Market' and 'Sustainable Rurality' scenario?*
- 2. Which rural areas in the enlarged EU provide the best conditions for the different farm types?*
- 3. Which environmental measures can be implemented by agriculture in a cost-effective way?*
- 4. Which other measures are required to guarantee an acceptable level of environmental protection?*
- 5. How will the different types of rural areas develop in the enlarged EU under the conditions of the 'Open Market' and 'Sustainable Rurality' scenario?*
- 6. What is the best way to stimulate local actors to generate and realize innovative ideas for the diversification of economic activities in rural areas?*
- 7. How can local resources ('territorial capital') be developed and innovated without excessive damage to nature, landscape or environment?*
- 8. What is the best way to prevent abandonment of farmland or to use this farmland in a productive way?*

2.7.2.6 Possible ESPON indicators for the scenarios

The 'List of ESPON-Database indicators' contains the following indicators related to the development of agriculture and rural areas. It does not, however, contain any indicators related to policy-making processes concerning agricultural, rural development or regional policy. The indicators are the same for both scenarios.

- Spatial typologies (01): Spatial classification (012) and Eligible areas (014)
- Agriculture (13): Land use (131), Farmers structure (132), Employment (133), Livestock (134), and Production (135)
- Tourism (17): Arrivals and stays (171), Accommodations (172), Attractions and facilities (173), and Enterprises and employment (174)
- Environment (12): Pollution (121)
- Wealth and production (04): Income and consumption (42)
- Population (02): Population structure (21) and Population movement (22)

2.8 Climate change

Introduction

Presentation

This section presents a scenario base and two sketches on climate change. Climate change is supposed to be the biggest environmental threat in future, with rather unpredictable results. It is for this reason that climate change is dealt with in a separate scenario, whereas environmental issues in general are integrated in the other scenarios like transport, energy and economy.

Little base material exists from previous ESPON studies, although some of ESPON project 1.3.1 results about hazards and climate change could be used. As a result, much information for the scenario base had to be compiled from other sources.

Two scenario sketches are presented, both of the prospective policy type. The main differentiating driving force of the two scenarios is society's attitude towards climate change. The first scenario assumes a growing priority for economic development. In this scenario, climate change is seen as a process that is happening anyway, and drastic mitigation and adaptation measurements are considered to be unrealistic and too harmful to the economy. Impacts are dealt with as they come. In the second scenario, climate change is felt as the biggest threat of human history, and very strict measures are implemented to stop the climate change process on the long term, and to minimize potential damage of ongoing impacts on the short and medium term.

It could be argued that climate change itself should be the differentiating factor between the two scenario sketches. The main reason not to do so is the fact that differences between climate change projections are only becoming significant after a 30 to 50 years time period. Any extreme fluctuation of climate change before 2030 would be rather unrealistic.

However, since climate change is such a long-term process, a window will be opened towards the year 2100. Uncertainty and variation in climate change predictions are very large for the coming century. The main issue of climate change in the 2005-2030 period is how to deal with this uncertainty.

Sources of information

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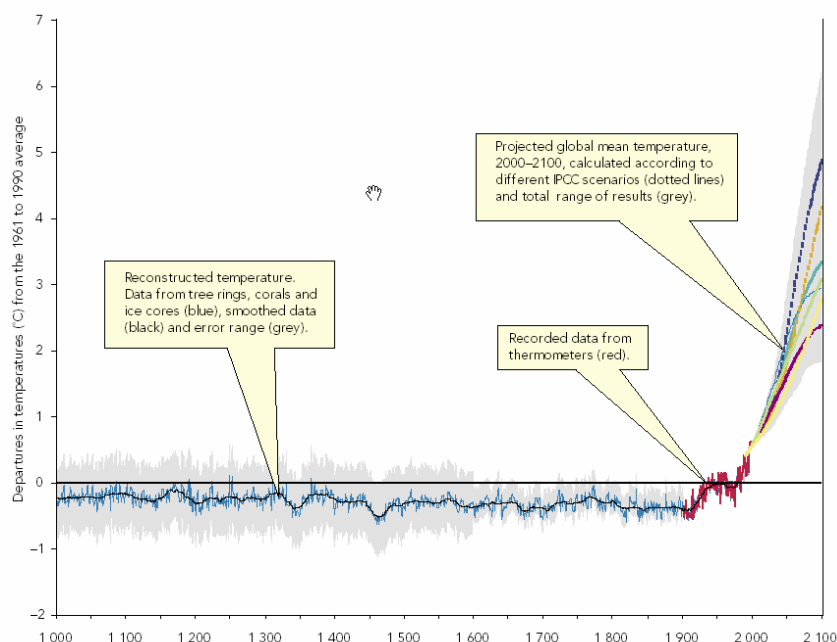
2.8.1 Scenario base

2.8.1.1 Facts about climate change and greenhouse gas concentrations

Climate change is taking place due to human induced greenhouse emissions. In 2005, this fact is hardly denied anymore by scientists or politicians. The facts about climate change, which will be presented in short, are outlined very carefully by the Intergovernmental Panel on Climate Change (IPCC). This body brings together the widest possible range of scientists and research results. The few remarks that still are being placed on some particular aspects of climate change evidence, like those of McIntyre and McKittrick (2005), are no longer undermining the general thesis.

The indisputableness of human induced climate change is the result of a long process of weighing the presumed evidence and of scientific and political debate. Nowadays, the debate has shifted from existence to magnitude and impacts of climate change. Although improvements are made in the scientific understanding of climate change processes, uncertainties about processes and impacts are yet very large.

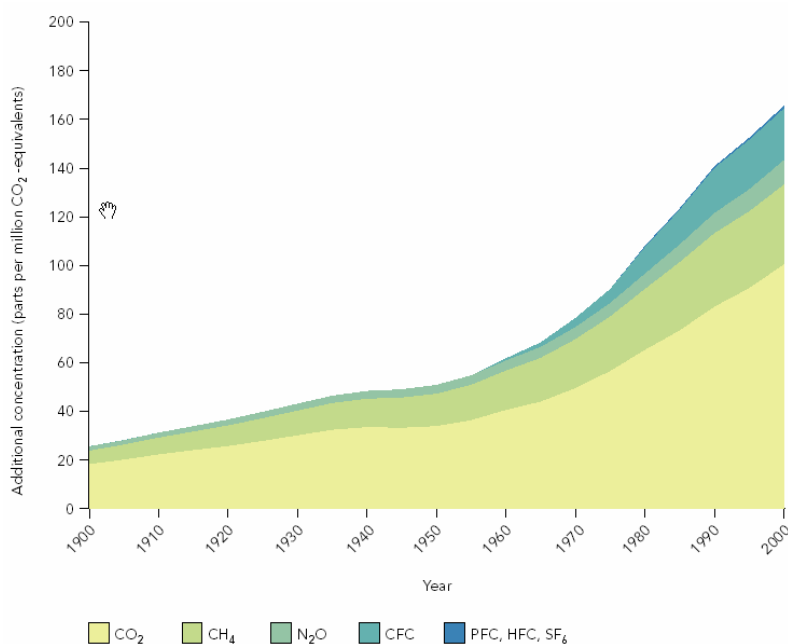
Looking at the current evidence of climate change, some important indicators speak for themselves. The earth’s climate has warmed rapidly by about 0.7 °C in the last century, with an increase of 0.95 °C in Europe. The ten hottest years of the 20th century took all place in the nineties. These increases are significantly larger than temperature variations of the past 1000 years (see figure 38).



Source: Mann et al., 1999 (last 1000 years); IPCC, 2001a (projection for the next 100 years).

Figure 38 Reconstructed and measured temperature over the last 1000 years (northern hemisphere) and projected temperature rise in the next 100 years

The temperature rises are caused by increasing greenhouse gas concentrations (mainly CO₂ and some other gases in smaller quantities). These gases have the ability to intercept and re-emit heat which is emitted from the earth's surface, thus leading to increases in global temperature (EEA, 2004). Although natural fluctuations of CO₂ concentration occur, its concentration has never been as high as present in the past 400.000 years. Moreover, CO₂ concentration has increased by 34% compared with pre-industrial levels, with an accelerated rise since 1950 (figure 2, EEA, 2004).



Source: IPCC, 2001

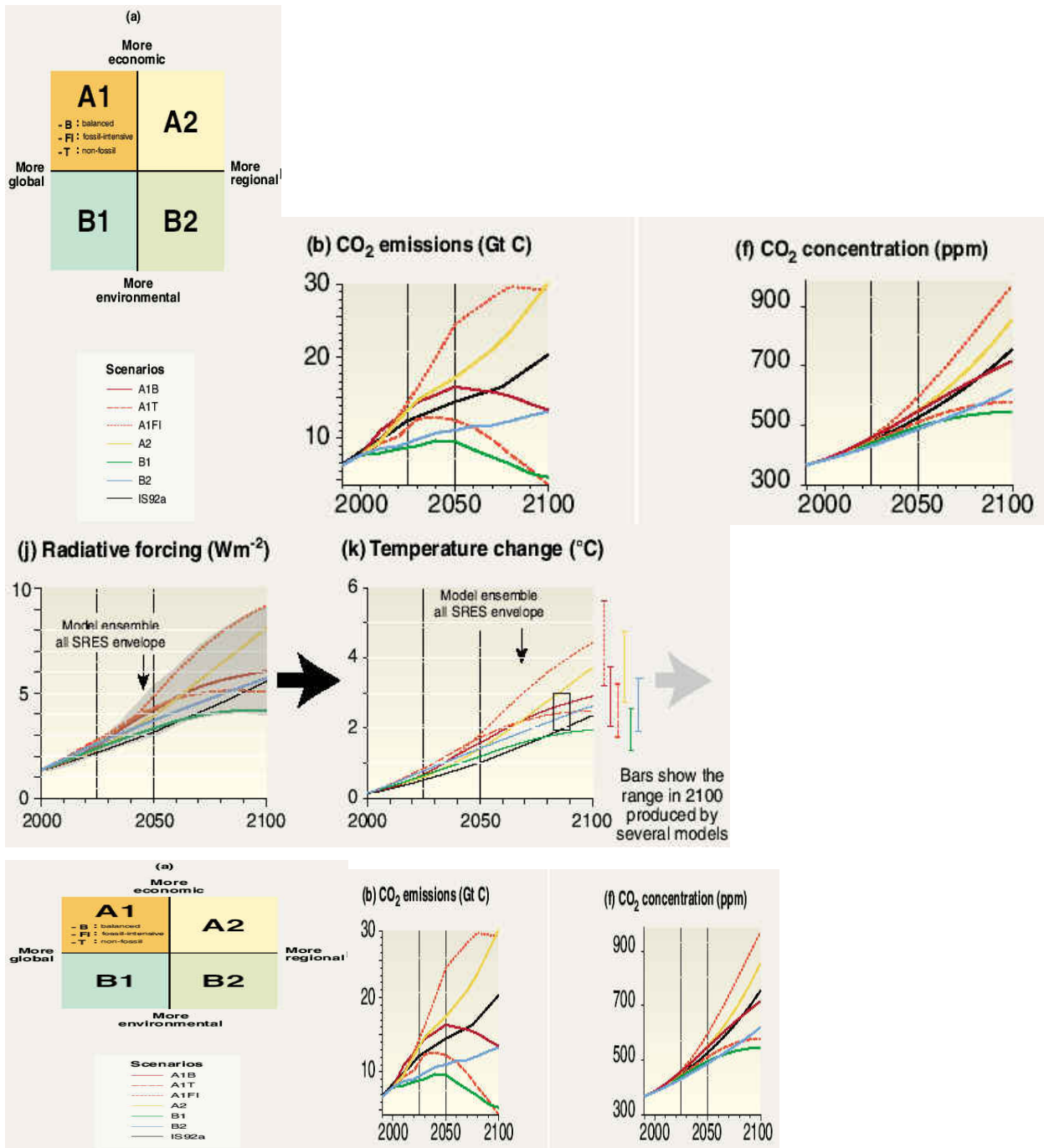
Figure 39 Rise of greenhouse gases concentration compared with the year 1750

However, the processes of CO₂ concentration influencing temperature and particularly precipitation are still not fully understood due to knowledge gaps about climate systems (EEA, 2004). The influence as such is there, and proved scientifically, but quantifications are hard to make. Consequently, predictions of future climate change as a result of a certain amount of gas emissions are surrounded by large margins of confidence.

On top of the uncertainty of the climate system itself, future emission of greenhouse gases is not easy to predict, either. Basically two dimensions can be distinguished that determine emission rates: development of clean technologies, and savings of energy use. The only certainty is that growing economies consume more energy. However, to what extent market processes or governmental regulations can foment the development of clean technologies is a fundamental question of debate. Depending on the expectations about the rate of the implementation of clean technologies, it can be argued to what extent measures are needed on energy savings by changing consumption patterns.

The IPCC made six scenarios where different socio-economic and technological development lead to very different future rates of greenhouse gas emissions. In fact, the basis of the scenarios are four socio-economic developments with two axis: globalization – regionalization and economy – ecology. Within the global economy scenario, three technological options are produced. From the emission rates calculated for each scenario, greenhouse gas concentration, temperature and sea level have been deduced (figure 40). It

should be remembered that all scenarios assume autonomous developments, without additional policy interventions towards active emission reduction.



Source: IPCC, 2001

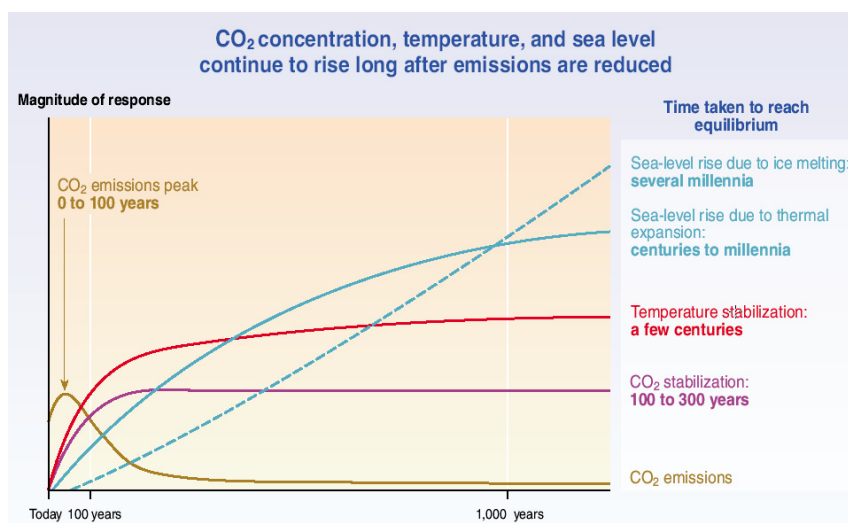
Figure 40 Projected temperature change and sea level rise according to different scenarios

Some important aspects can be deduced from the scenarios:

- 1) Technological developments are important to emission rates. Differences between the three technological developments within the global economy scenario are larger than differences between the different socio-economic scenarios as such.
- 2) Confidence margins are large, as a result of uncertainty in the climate models. For example, the upper end of the clean technology scenario is higher than the lower end of the continuing fossil fuel scenario.
- 3) IPCC concluded that the earth's surface temperature will rise between 1.4 and 5.8 °C until 2100. In Europe temperature rise will be between 2.0 and 6.3 °C.
- 4) Although climate change will be significant in 2100 in all scenarios, differences in 2030 as compared to the 2000 situation are still quite small.

The absence of large climatic differences between the scenarios within a 25 years time period is explained by the long time lag that exists between changes in CO₂ emission and effects on climate change. This is very important to realize when policies are designed and evaluated.

As a result, the IPCC members agree that any substantial measure of CO₂ reduction in the next decades will not avoid, but only slow down processes related to climate change which already have been initiated by past CO₂ emissions. These processes might continue for centuries, or even more. Figure 41 shows the time frames expected. A reduction of CO₂ emissions within 10 to 50 years leads to a stabilization of atmospheric CO₂ concentrations in 100 years, a temperature stabilization in a few centuries, while sea level rise continues even up to millennia.



Source: IPCC, 2001

Figure 41 Long-term projections of CO₂ concentration temperature and sea level

The magnitude of every effect is dependent on the final (reduced) CO₂ emission rate and the time it takes to achieve that rate. Although surrounded by uncertainties, general understanding was that a stabilization of CO₂ atmospheric concentration of 550 ppm will keep temperature rise in the order of 2°C (IPCC, 2001). New evidence suggests that a similar objective would require substantially lower concentration of 400 ppm (Grayling, 2005).

Climate change models are all based on slow natural processes, without sudden, extreme changes in the system. A change of the gulf stream to Northwestern Europe would change

climate dramatically, just as other events like the break down of the Western Antarctic ice sheet. Although very little is understood about the triggering factors, chances of such an event to happen are increasing with on going climate change. Some scientist (Retallack, 2005) even say a rapid change of climate within 20 to 30 years can no longer be discarded.

2.8.1.2 Greenhouse gas emission and capture

[To be written]

- Principle of emission versus sink
- Natural emissions and sinks
- Human emissions. Divided by countries and sectors.
- Future emissions and role of socio-economic, technological and political developments
- Complicating role of aerosols etc

2.8.1.3 Impacts of climate change

2.8.1.3.1 Defining climate change impacts

The discussion on climate change is relevant because it is expected to have large impacts on natural and socio-economic systems worldwide.

Impacts can be categorized along two lines; the atmospheric events themselves and their indirect results. Atmospheric events at their turn can be distinguished between long term trends (increasing average temperature) and changing frequency and/or magnitude of extreme events or hazards (storm surges, heat waves, etc.). Indirect impacts are related to these two categories. Sea level change or prolonged growing seasons are trend impacts result from changing average temperature. Increased flooding frequency is a hazard impact caused by more high intensity rainfall events. Both processes taken together might exacerbate the impacts. More storm surges on a certain coastline together with a higher sea level increases for example the risk of coastal flooding.

Measuring and predicting these impacts is not an easy task, for many reasons:

1. The *causality* of many changes is difficult to detect, separating climate change from other factors like land use changes or geological processes.
2. The frequency of extreme events is very low. As a result, *changes of frequencies and magnitudes* can only be observed over long periods of time. From the occurrence of one or two heat waves, for example, no estimation can be made on frequency changes.
3. The final socio-economic impacts might after all be most relevant to the political debate. These impacts depend largely on *society's capacity of dealing with changes*.
4. The *regionalization of impacts* is still hard to estimate, since climate scientists are still working on better models of regional distribution of weather related events. Only rough estimations of climate change exist.
5. *Abrupt changes or thresholds*, both in climate change itself as well as in the affected parameters, might induce sudden changes which are not predictable by trend analysis.

Many impacts are considered to amplify when a certain threshold is reached. Threshold values may be very different. Coral reef bleaching is assumed to happen after a 0.5 °C

temperature increase, whereas the melting of the Greenland ice sheet may start seriously after a 4 °C increase.

Although threshold values vary by type of impact, there is an increasing consensus that a global warming more than 2 °C would cause a chain of actions in climatic and indirect impacts that influence nature and society dramatically (Retallack, 2005).

2.8.1.3.2 Overview of climate change impacts

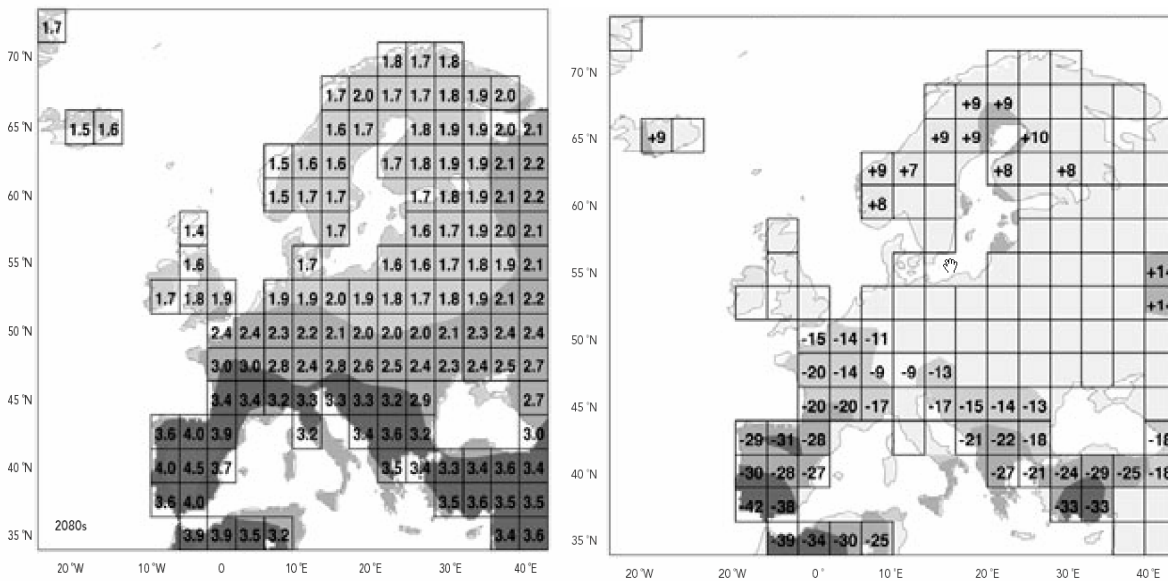
The most relevant information on climate change impact in Europe are summarized below. It should be realized that the magnitude of impacts depends on the intensity of climate change. A range of possible outcomes is not always mentioned. Secondly, some impacts are very clear, whereas others are rough guesses of what could happen.

Climate

Temperature has increased over all Europe, precipitation increased in the north and decreased in the south. Extreme events like storms, intensive precipitation or heat waves have been more frequent.

In future projections, this pattern is expected to continue. Southern Europe faces the highest rise of temperature and fall of summer precipitation, whereas Northern Europe can expect more rainfalls and slightly higher temperatures (figure 5). Particularly night temperatures will be higher, leading to a significant decrease of frost days.

Models for regional climate change are currently in development by EU projects like MICE and STARDEX (ESPON, 2004). First results are confirming the general trends of a hot and dry Mediterranean and a warm and wet north and western Europe. Some more regional specifications are made. Extreme precipitation events will be present all over northern Europe. In Southern Europe, however, decrease of average precipitation goes together with a continuing frequency of extreme events. Moreover, this trend shows local variations, generating pockets in Italy and the Balkan where extreme events are decreasing in number.



Note: Temperature change (°C) and summer precipitation change (%). Relative to average temperature and precipitation in the period 1961-1990. Intermediate ACACIA scenario in a broad range of possible future emissions.

Source: IPCC, 2001; Parry et al., 2000.

Figure 42 Projected temperature and summer precipitation changes in Europe up to 2080

Glaciers, snow and ice

The retreat of glaciers, snow and arctic ice has globally been observed, with a 20% retreat in European Alpine regions since 1980. In Norway, glaciers are extending their volume, due to increased snowfall. In general, however, extent and duration of snow cover across Europe has decrease since 1960. Sea ice in the Arctic has been in decline as well.

In future, about 75% of the glaciers in the Swiss Alps are likely to have disappeared. Snow cover will further decrease, affecting mountainous areas’ winter tourism. Arctic sea ice will further disappear, opening up more transit routes for ships.

Marine systems

During the last decades, sea level rise has been 0.8 – 3.0 mm per year. This has so far not had any severe consequences. More biological activity has been observed in the North Sea and the Baltic Sea, suggesting a shift of species towards the north.

Sea level is expected to rise 20 to 95 cm until 2100, and much more in the centuries to go. The rate of sea level change will be 2.2 to 4.4 times higher than in the twentieth century. Flat coastal plains and deltas are the most affected. Although European nations in general are well equipped for sea inundations, risk levels might increase dramatically. This is particularly the case in delta areas where sea level rise is combined with increasing frequency of storm surges and high river discharge. If both events happen at the same time, risk of very severe inundations is high.

Terrestrial ecosystems and biodiversity

A general northward movement of species has been observed. In many areas, this led to an additional decrease biodiversity on top of losses already experienced through habitat fragmentation and the like. At the same time, in some northern central countries biodiversity increases by the intrusion of new species.

By 2050, species distribution is projected to become substantially affected in many parts of Europe. Many species might become extinct due to limited adaptation capabilities (migration). This is particularly the case for mountainous areas.

Water

Annual river discharge has changed substantially, increasing in North and Eastern Europe, and decreasing in Spain and Portugal. Part of this increase is attributed to changes of precipitation numbers.

In future, this trend is expected to increase. Moreover, annual river discharge will fluctuate more, due to changes in precipitation and temperature distribution over the year. As a result, water availability will become more unevenly spread over Europe (too much in the north, too little in the south). Additionally, annual changes in river discharge at a local level will affect water availability over the year, and possibly shipping transport, too.

The frequency of floods, and particularly flash floods with highest risk of fatality, is likely to increase. ESPON 1.3.1 is trying to produce a map to what extent climate change will contribute to an increase of flood hazards at NUTS3 level.
[still to come]

Agriculture

The length of growing season has increased by 10 days between 1962 and 1995. Higher yields could have been expected due to higher CO₂ absorption of plants, but this has not been registered yet. In the heat wave of 2003, agricultural losses in southern Europe were up to 30%, whereas yields in northern Europe were higher as usual.

CO₂ absorption could become a factor of increasing harvests in future. A shift of cultivated areas to the north can be expected. Agriculture in southern Europe will suffer from heat and water stress.

Economy

79% of economic losses caused by catastrophic events resulted from weather and climate related events. Average annual losses are now estimated to be around 10 billion euro. They have increased significantly during the past 20 years, both due to wealth increase and more frequent events. Economic losses as a result of climate change related catastrophic events are expected to increase further in future.

Indirect economic impacts are manifold, like decreasing winter tourism, decreasing industrial activities due to lack of water, decreasing or increasing income from agriculture, etc. Other economic impacts are related to measures needed to prevent hazards, like investments in water systems, moving from river valleys, etc. Not much literature has been found yet to estimate all these aspects.

Human health

Heat waves, floods and the spread of ticks have caused numerous fatalities and diseases. These are expected to increase in future, too.

2.8.1.3.3 Regionalization of climate change impacts

A first, tentative attempt to regionalize climate change impacts in Europe is presented below. Two aspects are taken into account; the impacts themselves, and possible mitigation and adaptation measures. Currently, research is intensifying on this issue. The next IPCC report in 2007 promises to include a quantification and regionalization of impacts. EU and national programs will lead to more insights in the years to come.

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

Examples of territorial damages caused by climate change in the past decade in Europe

Climate change has already caused important damages in European regions and current evolutions are potentially threatening territorial and environmental balance.

Flooding hazards have been numerous and very damaging during the past 10/15 years. Although most of them took place in the northern half of Europe (Rhine/Meuse basin, Elbe and Oder basins, English river basins), a number of floods had also tragic impacts in southern Europe (North-West Spain, Southern France, Northern Italy). Important prevention programmes and measures have been implemented, a number of them being supported by Interreg in the context of transnational cooperation.

Drought is particularly affecting the southern half of Europe. In recent years, it has been detrimental to agriculture with a significant reduction of harvest and yields. Usually, drought is mainly concentrated in summertime. Summer 2003 was a particular case affecting agriculture also in regions further in the north. A more recent and more damaging manifestation of climate change is drought in winter time. Drought during the winter 2004/2005 has particularly affected Portugal, Spain, France and Italy. In Portugal, water levels in barrages is extremely low, causing problems for electricity production. The same happens in Corsica, where electricity shortages in February/March have caused troubles. Agriculture is severely affected in all three countries. Cattle breeding and dairy production are suffering from the lack of fodder. Fruit production in southern regions is also affected, with a large number of trees threatened to die. Fish mortality in rivers is significant. Risks of forest fires have strongly increased. Numerous measures are taken in the field of water saving, in particular through the control of irrigation, but also in other sectors, such as tourism (golfs, swimming pools etc.).

Storms and hurricanes had strongly damaging impacts in winter 1999, in particular in France and Germany, as well as in winter 2004/2005 in northern England/Scotland, northern Germany, Denmark and Poland.

The heat wave during summer 2003 has caused 30 000 human deaths.

In October 2004, a natural mountain lake at 3200 m altitude in French Savoie was overfilled due to the melting of the Rochemelon glacier. Water had to be artificially pumped out in order to prevent a disaster. Scientists from the Grenoble university had predicted that in case the 5 ha and 25 m deep lake had overflowed, the water stream would have rapidly dug out a deep hole in the ice dam retaining the lake, so that a devastating wave would have been generated, flooding the villages down in the valley.

Various types of measures are already being taken. The most striking one is the wrapping up of glaciers with special plastic foam in Switzerland, in order to protect them from the sunshine. In Andermatt, the Gurschen glacier, used for winter skiing, will be covered with a plastic foam on a surface of 3000m² in a first stage. If the experiment is positive, the total area of the glacier will be covered with foam. Other wintersport areas in Switzerland (Titlis near Luzern, Saas Fee) are envisaging the application of similar techniques. According to a study of the Zurich university, Swiss glaciers have lost 18% of their surface within 15 years (1985-2000) due to climate change, compared with a lost of only 1% between 1973 and 1985.

2.8.1.4 Coping strategies

Two different strategies exist for coping with climate change: mitigation and adaptation. Mitigation measures are those which lead to a reduction of greenhouse gas emission, stabilizing atmospheric concentrations and therefore contribute structurally to temper the magnitude of climate change. Mitigation can be done by a range of instruments like promotion of environmentally friendly technologies, change of land use by planting trees or bio fuel plants, or reducing transport volumes. Climate stabilization, the ultimate goal of the measures, can only be reached after decades or centuries.

Adaptation measures do not help to reduce the climate change itself, but to decrease its effects. These measures are necessary in order to cope with short and medium term effects. Adaptation can be proactive or reactive. Proactive measures like increasing river bed areas or construction of heat resistant houses anticipate expected changes, with the risk of 'mal-adaptation' or disinvestments if these changes do not happen (NWO, 2004). Reactive measures like food supplies or farmers subsidies after prolonged periods of lost harvests are symptomatic or, if structural, very expensive in comparison to proactive measures.

Debate is going on about the costs of mitigation and adaptation. Agreement exists on the fact that mitigation measures in tropical areas are much cheaper than in high altitude areas like Europe. This counts for biological measures like reforestation or changing land use. More disagreement exists on the cost effectiveness of measures to be taken in industrialized countries. A common fear is the decline of competitiveness of a nation if too many restrictions of energy use or obligations of expensive clean technologies are put in place. Research shows contradictory messages. CPB (2004) concludes that different measures of emission reduction would have negative impact on economic growth. The EU Commission, on the other hand, states that 'cost-effective' measures can be very substantial.

Vulnerability to climate change varies across natural and socio-economic settings. In general, poor people are affected mostly, since they live in most vulnerable places, or depend critically on annual climate situations for successful harvests. Geographically, areas vulnerable to floods (river valleys, flat coast lines) and droughts (areas semi arid climate) are most critical. Adaptation measures reduce vulnerability and improve resilience capacities of areas. Reducing vulnerability would be the construction of dams. Improving resilience can be achieved by diversifying economic activities of poor farmers. ESPON project 1.3.1 (2004) has tried to identify risk of areas, risk being defined as a multiplication of hazards (chances of some event to happen) and vulnerability (ability to cope with consequences). Although globally the discussion is focused on most vulnerable areas situated in developing countries, the ESPON report stresses the lack of a risk mitigation framework at all levels in the EU.

- [incorporate regionalization of risk from ESPON 1.3.1., to be produced in April 2005]

2.8.1.5 Climate policy: history and driving forces

2.8.1.5.1 1970-1985

- Club of Rome
- Oil crisis, Acid Rain, Ozone gap: examples of worldwide environmental hazards dealt with by international policy.

2.8.1.5.2 1986-1995

Emerging scientific evidence about climate change gradually put the issue on the policy agenda. The issue was picked up seriously by the Brundtland report (1987). This report launched the principle of sustainable development, coupling ecological sustainability to social and economic issues worldwide, thus linking poverty with sustainability. The multi-facet character of climate change fitted very well within this principle.

The growing international concern about climate change led to the establishment of the International Panel on Climate Change (IPCC) in 1988 and the adoption of the Framework Convention on Climate Change (FCCC) in 1992. The IPCC presents summaries of evolving scientific information to policy makers, including all possible opinions on climate science. The evidence of climate change has been growing over the years, reflected in the cautiously defined signals in the first report and the more conclusive results in consecutive publications. IPCC report triggered negotiations leading to the FCCC in 1992. Country participation in emission reductions was still on a voluntary basis (Hampton, 2004).

The EU took the lead in climate change negotiations in 1990. The first notion of climate change came forth in the European Parliament in 1986. The Commission responded only by mentioning the need for further research in the Forth Environmental Action Plan (1987-1992). In 1990, when climate change evidence was presented by the IPCC, the Council prompted for more action. It decided to include climate change objectives in its policies stating that emissions in 2000 should not exceed the 1990 level. This decision was taken just before the Second Climate Conference, creating a firm strategical position in UN discussions on climate change measures.

From then on, a series of measures have been proposed and most of them implemented, both by integrating specific issues in sector policies and by defining targeted climate change policies. Most involved sector policies were energy (energy efficiency, promotion of renewable energy, CO₂-energy tax, energy networks) and transport (energy efficient transport, focus on rail and water transport, road pricing). Climate change policy was further enhanced by a monitoring mechanism for greenhouse gas emissions (VROM, 2005).

2.8.1.5.3 1996-2005

The failure of the voluntary approach of the FCCC to achieve emissions reduction led to the adoption of the Kyoto Protocol in 1997. Kyoto establishes mandatory absolute caps of greenhouse gas emissions for industrialized countries (the so called 'Annex I countries'). The overall objective is to reduce the total amount of greenhouse gas emission of industrialized countries to 5.2% below the 1990 level in 2010. Each country or group of

countries has been assigned a different reduction target: EU 8 %, USA 7 %, Japan and Canada 6% reduction. Australia would be allowed to expand emission rates by 8%.

To ensure cost-effectiveness of the measures to be taken, three flexible mechanisms are included in the protocol.

1. Joint implementation: an industrialized country may implement a project that reduces emissions in the territory of another industrialized country.
2. Clean development mechanism: an industrialized country may implement a project in developing countries.
3. Emissions trading: an industrialized country may transfer some of the emissions under its assignment amount to another industrialized country that finds it relatively more difficult to meet its emissions target.

The Kyoto Protocol entered into force on 16 February 2005, almost eight years after its signing. This happened because the number of countries which has adopted the Protocol accounts for more than 55% of greenhouse gas emissions in the world. The USA and Australia have made clear they will not include the Protocol in their legislation.

The difficulties of getting Kyoto implemented reflect the conflictive character of the negotiations. The main differences of opinion are concentrated on four issues:

- To what extent should climate change be mitigated, and what final emission rate is needed?
- Who should contribute?
- Which coping strategy should be prioritized, mitigation or adaptation?
- To what extent can emission reduction be made flexible by trading mechanisms, and to what extent are they cost-effective?

Different coalitions have emerged during the negotiation process. The USA is leading a heterogeneous group of countries with similar points of view, driven by different reasons. The so called umbrella group consists of Australia, Japan, Norway, Canada, South Africa and the USA. They all agree that harsh mitigation measures affect their economy too much. Developing countries are not bound to emission restriction because they had an insignificant share in the cause of climate change so far. This share of burden principle (the polluter pays) is another important reason for the USA not to implement the Protocol.

EU has been the party which stands for drastic measures, obliged to do many concessions to save the outcome of the Protocol. EU entered Kyoto negotiations in 1997 with the purpose to agree a 15% reduction of emissions in 2010 compared to 1990 level (VRM, 2005), rather high compared to the final result (5.2% reduction). The mechanisms of emissions trading would be much stricter and emission caps much lower if EU would have imposed its point of view.

Developing countries are reluctant to any measure which require financial efforts from their part, reasoning that they still have a development path to go, whereas industrialized countries have caused the problem. Moreover, they stress the importance of sufficient adaptation measures, to be paid by funds coming from industrialized countries. Small islands constitute the final group, very much affected by the smallest climate changes.

The EU translated the Kyoto Protocol into a rather general policy document (2000) without concrete measures. In June 2001, the European Program on Climate Change (EPCC) was launched which mainly reaffirms existing policies and adds a few new ones. Despite the relatively small differences with existing policies, the program

has only been agreed upon in June 2003. The delay was caused by protests from the European business group UNICE. This group opposed the frontline EU emission reduction strategy.

The EPCC program calculates that if all cost effective options for mitigation (being measures costing less than € 20,- per reduced ton CO₂) would be implemented, the required emission reduction by Kyoto for 2010 would even be doubled. This is a rather optimistic view compared to an earlier EU statement in 1995 which said cost-effective measures could stabilize 2000-2010 emissions, and 'technical possibilities exist' to reduce emission by 10%. This optimistic view is at contrast with emission data of recent past. In 2001, EU emissions were 2.3% below 1990, indicating that the EU has lost some of the gains that it made in 1999 and 2000. Measures currently in place will not allow the EU to achieve its Kyoto target (Commission of the EU, 2003).

The EU implemented a Directive on Greenhouse Gas Emission Trading (2003) which allows for flexible application of trade schemes. When Kyoto enters into force, emission trading with Russia will further lower reduction costs.

Undoubtedly, the most problematic issue in climate change measures is the internization of climate costs in energy use through taxes or other means. Commissions' initiatives in this direction have been vetoed since 1992. Only in 2003 the first agreement on taxes has been made, with many exemptions, long introduction periods and applicable only to a few sectors.

Emission reduction targets vary greatly across the EU. Countries like Denmark, Germany and Luxemburg must reduce their emissions by more than 20 %, whereas emissions in Portugal and Greece are allowed to rise by more than 25 % (table below).

| | |
|----------------|--------|
| Austria | -13% |
| Belgium | -7,5% |
| Denmark | -21% |
| Finland | 0% |
| France | 0% |
| Germany | -21% |
| Greece | +25% |
| Ireland | +13% |
| Italy | -6,5% |
| Luxemburg | -28% |
| Netherlands | -6% |
| Portugal | +27% |
| Spain | +15% |
| Sweden | +4% |
| United Kingdom | -12,5% |

Source: VROM (2005)

Table 26 Kyoto emission caps distributed among Member States (2012 compared to 1990)

2.8.1.5.4 Near future

With the Kyoto Protocol just in force, near future will show to what extent nations are committed to the principles of climate change policies when tangible results are required. The EU is now facing the challenge of intensifying efforts to be able to fulfill its obligations by 2010. Success of mitigation strategies like emission trade, and policies on energy, transport and technology could encourage member states and other world nations to continue the search for the right measures. Arguments in the other direction hold true, too. If Kyoto is not even able to make the currently participating countries fulfill their relatively weak reduction targets, how could future action expected to be more successful?

Parties are already positioning themselves for post Kyoto policies. The Commission of the EU (2005) has published a report on how it should embark on these discussions, including 'a cost benefit analysis which takes account both of environmental and competitiveness considerations'. In its recommendations, it stresses the need for further market based and flexible instruments, but also the acceptance of adaptation funding to most vulnerable developing countries. Public awareness should be risen in order to ensure support for climate change measures. The report does not plead for any reduction targets, as this depends on the willingness of other world nations for reduction caps, it says. Some member states however positioned themselves already at the forefront of the target discussion. Germany committed itself to 30% reduction in 2020, and the UK to 60% reduction in 2050.

Movements of other countries are still scarce. Development countries stick on their position that the USA has to take the first step before they will commit to any obligation. US government is now slightly moving towards more willingness in climate change policies. The Bush administration has in some way accepted the evidence of climate change after the conclusions of its own scientific review and the proposal of its own Climate Change Initiatives. Although the intensity targets used in the proposal only cause emissions to increase at a lower rate than they would without measures put in place, it opens prospects for longer-term US participation in a global climate change regime (de Moor et al., 2002).

Not only the UN, but also other forums are used to address climate change. The recent initiative of the UK to prioritize climate change on the agenda of the G8 has already led to a task force urging for more actions of this group. The Climate Action Network (CAN) proposes three tracks to advance climate change measures: mitigation by successor of Kyoto, greening (decarbonisation) in countries with heavy dependency on coal (like US, China, South Africa) and adaptation measures principally for developing countries.

All this can be seen in a wider perspective of environmental policies in relation to economic, social and technological developments. Recent debates about the reinforcement of the Lisbon strategy might be a sign of a shift in emphasis from ecological to economic sustainability. Although the new EU Commission carefully states that increasing focus on economy and employment does not mean putting sustainability at stake, this is evidently the fear of many interest groups. The EEA (2004) even states that renewed persecution of Lisbon goals implies a choice between further environmental deterioration or a fundamental change of way of life (EEA, 2004b). RIVM (2004b) recommends a balance between technology improvement policies and those which focus on change of attitude.

Improving scientific insights will increase, therefore reducing the enormous uncertainties surrounding the climate change debate. Evidence will grow for the risk of threshold values to be crossed. The current standpoint of an importantly large group of scientists and politicians that global warming exceeding 2 degrees Celsius will cause detrimental and irreversible effects, will be further sharpened by more precise estimations. As climate science improves, it will be easier to identify the local impacts of human-induced warming in

a way that is useful to individual communities (Hampton, 2004). This will increase the chances for a targeted, international policy on climate change.

2.8.1.6 Summary

Climate change is accelerating due to human influence. Although large uncertainties exist about the exact magnitude, the vast majority of climate scientists is convinced of the effect of global warming. Greenhouse gas emissions from transport, industry and other sectors leads to increasing atmospheric concentration, which in turn leads to rising temperatures.

How climate change will look like in the future is difficult to predict. All steps in the causality chain are difficult to quantify. Moreover, a large time lag exists between emission rates and temperature rises. A sudden stop of emissions now would only result in temperature stabilization in 50 to 100 years time.

Predictions are that the average temperature in Europe will rise between 2.0 and 6.3 degrees Celsius until the year 2100. Increase will be highest in Southern Europe. At the same time, rainfall will be less in the South, whereas Northern Europe is expected to receive more rainfall.

Climate change impacts are difficult to distinguish from other factors like land use change or atmospheric conditions. Most important impacts are water shortage, desertification, forest fires, decreasing tourism and agriculture in Southern Europe. In the north, floods are expected to be more intense and frequent. Agriculture will expand northwards. Mountainous areas are affected by shrinking winter seasons, negatively affecting tourism. Biodiversity is at threat in most areas. And with frequent heat waves, human casualties will increase.

There are two coping mechanisms to deal with climate change: mitigation and adaptation. Mitigation measures try to reduce greenhouse gas emission and therefore temper the magnitude of climate change. Results can only be expected at the very long run. Adaptation measures are interventions to deal with the impacts of climate change. Adaptation can be pro-active, or preventive, which means that investments take place to prepare for events that might eventually happen. Reserving more space for river beds is a preventive measure, just like the change to a less water consuming agriculture. They can also be re-active; this kind of measures deals with the consequences of an impact which already happened. Reparation of farmers' income after misharvest or flooding is an example.

Policy reaction to climate change is ambivalent. Although many sectors perceive the seriousness of the problem, uncertainties about the necessity and the effectiveness of costly and sometimes unpopular measures prevent serious action in many cases. On mitigation this has been evident in the Kyoto-process. On adaptation, local experiences of displacement proposals in river valleys show people are reluctant to accept these measures.

2.8.2 Scenarios

2.8.2.1 Introduction to the scenarios

The most important criterion for the elaboration of scenarios in ESPON 3.2 is that they should help decision makers in the broad spectrum of possible (external) developments and the way their decisions could make a difference. The construction of two scenarios with opposing external developments and/or opposing policy decisions is most helpful to that goal.

Here, the choice has been made to make two scenarios with opposing policy decisions, keeping the external development of climate change the same.

The differing factor between the two sketches is the way society deals with the enormous uncertainty coming with the issue of climate change. There are basically two extreme standpoints towards uncertainty: *face consequences as they come* or *prepare for the worst*. These two opposing standpoints are the base for the story lines of both sketches. In the first scenario, only weak measures are taken, whereas in the second sketch, all will be done to reduce emissions, and particularly to prevent disastrous damages by taking adaptation measures.

The reason to define just *one story line for climate change* is founded on the fact that IPCC climate change scenarios only differ significantly after a period of 50 to 100 years. As a result, one story line is presented which reflects the *average climate change trend until 2030*. Without being too precise in defining what this trend will be, global warming will continue, northern Europe will receive more intensive rainfalls, and southern Europe will face serious droughts and heat waves.

In the sketches, the term *prevention* is used for pro-active adaptation measures mentioned earlier in the scenario base. These measures prepare territories for climate change impacts which will or might happen in future. *Repairing* coincides with re-active adaptation measures. This action refers to reacting to climate change events as they happen. *Mitigation* measures are a different category; they prevent the acceleration of climate change, not the damage caused by its impacts.

2.8.2.2 Scenario 1: 'Repairing instead of preventing'

2.8.2.2.1 Scenario hypothesis

The potential magnitude of climate change over a long time period has been recognized, but the main players in the policy arena are reluctant to take preventive, sometimes drastic measures, mainly because such measures are not popular and may even be politically counterproductive. Prevention measures are kept to a minimum, because of too large uncertainties about where natural hazards and damages resulting from climate change are going to occur.

2.8.2.2.2 *Driving forces*

Climate change is in itself the most important driving force, being sustained by the increase of greenhouse gas emissions. Driving forces related to possible attitudes and policy responses regarding climate change are among others:

- The existence of other important priorities in the public debate which overshadow the issue of climate change , such as security and terrorism, immigration and integration, population ageing, boosting economic development;
- The uncertainty about magnitude and impacts of climate change;
- The difficulties to grasp this issue technically and the insufficient awareness about the potential impacts of prevention measures;
- The resistance of society and stakeholders towards changing attitudes and practices.

2.8.2.2.3 *Context*

Although growing evidence and public concern about climate change took place between 1990 and 2005, this issue could not improve its position in the political agenda. The commonly shared feeling that the main cause of climate change is the increase of greenhouse gas emissions generated by human activities led people and politicians to the conclusion that the implementation of the Kyoto Agreement would be in itself sufficient and that no other short term measures to prevent the amplitude of damages caused by climate change were necessary, except a few actions already undertaken.

2.8.2.2.4 *Scenario process*

After the enforcement of the Kyoto Agreement in February 2005, there was a general feeling that the main cause of climate change had been tackled and that it was sufficient to expect a curb down or even reversal of trends in climate change when the volume of greenhouse gas would have diminished.

In a number of European regions, however, there was less ground for optimism, because precisely when the Kyoto Agreement entered into force, numerous southern regions in Portugal, Spain, France and Italy were confronted with the most severe winter drought they ever had over the past 50 years. In some regions, such as Corsica, it was necessary to urgently import oil-fuelled machinery to produce electricity, because hydro-electric plants had no more water reserves. Concerns expressed in winter time were confirmed in summer time, while drought went on. Severe damages occurred in agriculture. In the following years, longer and longer drought periods occurred, but irregularly, with some periods being characterized by sudden, heavy rainfalls. These caused numerous damages to soil and settlement, but were not very beneficial to the re-constitution of underground water reserves, because their duration was too short and their occurrence too irregular. Every year, in particular in summer time, numerous forest fires destroyed large forest areas in southern regions, causing damages also to settlements. The more forests were destroyed, the more the water and humidity retention capacity was reduced. This vicious circle led to more severe constraints in terms of water management and occasioned the washing of soil through periodic heavy rainfalls.

The role of hydro-electricity in energy supply, which had been the most important renewable energy source in southern mountainous regions, decreased significantly. Political pressure for building new power plants developed.

Tourism in southern Europe was severely affected also. In coastal regions, mass tourism was confronted to a significant shortage of water supply. The construction of de-salinisation plants of sea water became generalized and this absorbed important amounts of resources and increased the price of holidays. The attractiveness of these regions was also reduced by the fact that numerous highly water consuming facilities such as golf terrains, large swimming pools, artificial parks and green areas etc. had to be restricted. Winter tourism in mountain regions also lost importance, because the occurrence of snow falls became more and more irregular. Seasons for skiing started later and ended sooner. All together, the economic importance of tourism in southern Europe declined.

In the northern half of Europe, problems related to climate change were of a different nature. Drought also occurred periodically; mainly in summer time, but was by far not so damaging as in southern Europe and was compensated by more regular rainfalls in other seasons. A specific problem was the frequent occurrence of heavy rainfalls followed by flooding. Damages were significant, because a lot of factors were working against the development of prevention measures. New settlements were developed along rivers due to land speculation and existing building rights.

Numerous rural areas in the central and northern parts of Europe had to compensate for the decline of agricultural production in southern Europe. Production of dairy products, vegetables and fruits intensified and the production of energy crops strongly developed. Rural areas were therefore put under high production pressure while they were more and more abandoned by farmers in southern Europe.

A significant revival of tourism could be observed in central and northern Europe, but benefiting also to a number of mountainous areas. Winter sport in Nordic countries became very popular.

By 2015, the intensity of damages generated by climate change had reached such levels that national governments could not cope with the numerous requests for subsidies to finance repair works and to compensate for the loss of farmers' revenue. After difficult negotiations, a specific fund was created in the EU budget, on the model of the budget line for natural hazards created at the end of the 1990s, but with a significantly higher amount of resources. This amount had to be regularly increased.

Coming back to the implementation of the Kyoto Agreement, experience proved that the objectives could not be achieved. While new technologies made it possible to reduce nominally the amounts of greenhouse gas emissions, the increase of traffic flows and the development of new coal-fired power plants aiming at counteracting the high price levels of oil and gas, generated large volumes of greenhouse gas emissions. By 2030, the perspective of a trend reversal in climate change had become an illusion.

2.8.2.2.5 *Impacts*

Macro-economic impacts

The macro-economic impacts of natural hazards caused by climate change have been significant. On the one hand, sudden events, such as forest fires or flooding caused

important damages to settlements and landscapes which made expensive measures for repair and maintenance necessary. On the other hand, the economic capacity declined structurally in a number of regions, in particular in southern Europe, and more particularly in rural regions and in tourist areas (coasts and mountains). The loss of revenue of the economic stakeholders concerned had to be compensated by the distribution of resources from public budgets.

Regional, territorial and environmental impacts

At macro-scale, the territorial impacts of climate change show a clear divide between northern and southern Europe, the latter being much more affected.

At meso-scale, important impacts can be observed at the scale of river basins, large coastal areas or mountain chains, a number of them with a transnational character. Factors of homogeneity play there an important part, such as geomorphology, vegetation, altitude etc., but interactions are also noticeable between various types of areas. While mountains are generally considered as water providers, valleys and plains are the beneficiaries. If mountains become dryer, valleys and plains will be negatively affected. Another aspect at that scale is the importance of migration movements of population out of a number of rural areas in southern Europe. Inversely, migration flows from northern Europe to southern Europe (retired people etc.) have strongly slowed down.

At local/regional scale, main impacts can be observed there where damages have been caused (flooding in particular). In addition to this, the internal structure of numerous rural areas has changed, some being more or less abandoned (in the south), others being more under pressure (in the north).

2.8.2.2.6 Final image

By 2030, climate change, accompanied by a lack of prevention policies, has led to important modifications of the European territory.

In southern Europe, large stretches of hilly and mountainous areas which were in 2000 covered by oak and pine forests, have burnt and drought has made the reconstitution of forests impossible. They have become arid desert areas with only little vegetation. A number of rural areas have been abandoned by farmers. Rural landscapes have no longer been maintained and cared for, so that they are invaded by wild vegetation drying in summertime and particularly prone to fires. Life in villages and small towns has been shrinking, with less services and jobs and more ageing population. A number of holiday resorts in coastal areas and in southern mountains have become derelict sites.

In central and northern Europe, the situation is strongly different. Rural areas are more intensely used, both for food and energy production. Tourism is flourishing again, in particular in hilly landscapes and medium-sized mountains. Nordic areas also benefit more from tourism.

Damages to the environment are significant. In southern Europe, valuable Mediterranean landscapes have been destroyed. Numerous areas have become more sensitive to external pressure (sensitiveness of soil to heavy rainfalls, higher risk of fires, fragilisation of ecosystems etc.). Water resources are largely exhausted and do not enable the development of large-scale projects any more. The abandonment of rural areas by farmers has severely affected the cultural landscapes. Derelict sites have emerged in tourist areas.

In central and northern Europe, damages to settlements, infrastructure and landscapes have been caused by flooding in numerous valleys. Stronger environmental pressure can be observed in a number of rural areas due to more intensive agriculture.

2.8.2.2.7 *Main issues resulting from the scenario*

Climate change seems unavoidable and brings with it long-term effects and impacts on the territory. If public policies limit themselves to the Kyoto Agreement, hoping that the reduction of greenhouse gas emissions will solve the problem, then two types of problems may appear. First, the implementation of the Kyoto Agreement may prove more difficult than expected and second, even if successful, its impacts will be noticeable only in the very long-term. In between, numerous negative aspects of climate change will cause serious damages to the European territory.

2.8.2.2.8 *Summary*

Climate change has been notable throughout Europe in the 2005-2030 period. Southern Europe was most severely hit, particularly by droughts and heat waves. Water shortages, misharvests and forest fires were among the most severe consequences. Northern Europe was mostly affected by floods, but faced increasing opportunities for agricultural expansion as well.

Adaption policies to climate change were minimal. Other priorities in the public debate overshadowed climate change impacts, and the large uncertainties about climate change and its impacts refrained politicians from taking severe prevention measures. Mitigation policies reducing greenhouse gas emission, such as the Kyoto Protocol and its successors, were not very successful.

As a result, negative consequences of climate change were repaired by subsidies and hazard funds, without structurally adapting territorial systems to the changing circumstances. Tourism in Southern Europe became more expensive because of elevated water prices; numerous rural areas were abandoned because of unfeasible agriculture, leading to extensive forest fires and desertification, further aggravating the problem of water supply to river and coastal plains. In Northern Europe, floods caused much damage because of insufficient protection measures. On the other hand, rural areas in Northern Europe flourish due to increased activities in the agricultural and tourism sectors.

In 2030, mitigation measures up till then were highly insufficient. The climate change process will continue in the same pace or even accelerate, leading to many more severe damages in the 2030-2100 period.

2.8.2.3 Scenario 2: 'Anticipation of climate change by prevention measures'

2.8.2.3.1 Scenario hypothesis

The scenario is a policy scenario. It is based on the assumption that only prevention measures in various fields are likely to alleviate the negative territorial impacts of climate change, in addition to the fact that the Kyoto Agreement will be enforced and will generate positive impacts on climate change in the very long term.

2.8.2.3.2 Driving forces

The main driving force of climate change is the increase of greenhouse gas emissions. As far as policy responses are concerned, the main driving forces are:

- The awareness of damages already caused by climate change in European regions and the need to urgently take measures in order to avoid the amplification of such damages in future;
- The awareness that the deterioration of the European territory by natural hazards has extremely negative economic and social impacts and endangers the mobilization of the territorial potential of European regions;
- The political willingness to tackle the issues related to climate change at European level with strategies additional to the Kyoto agreement.

2.8.2.3.3 Context

During the decade 1995-2005, Europe has been affected by a series of natural hazards related to climate change (flooding, hurricanes, drought, forest fires etc.) which had a strong psychological impact on the European population and on elected people. The drought in southern Europe during the winter 2004/2005 showed the amplitude and extent of territorial damages and acted as a kind of catalyst for awareness raising. It became clear at European level that more resources should be invested in prevention measures instead of distributing EU money case by case to repair the damages already caused by natural hazards.

2.8.2.3.4 Scenario process

The reform of EU structural policies in 2005/2006 was taken as an opportunity to enlarge the eligibility of EU-supported actions to measures related to the prevention of natural hazards, in particular in relation to climate change. EU measures were complemented by national/regional measures in various fields (sectoral policies, building regulations etc.). a policy agenda was elaborated and adopted with a thematic structure, involving the various decisional levels. Main building blocks were the protection of water resources, the management of rural landscapes and forests, the relationships between territorial development and renewable energy sources, the prevention of flood damages and the re-shaping of transport policies.

The integrated protection of water resources was a particularly important and ambitious priority, especially for the countries and regions of southern Europe. It called for numerous innovative techniques and practices and interfered strongly with a large number of fields of activity. The future of agriculture was one of the most central activities concerned. Crops requiring intensive irrigation were re-considered and adapted. The cultivation of various crops such as maize, requiring large quantities of water, were strongly restricted. Water-saving techniques and technologies were generalized and supported by public resources. Area specific strategies were elaborated in order to optimize the cultivation of soil in relation with the characteristics of the area (hydrology, local climate, natural vegetation etc.). New types of cultures were introduced which took account of the increase of average temperature and of the scarcity of water. Awareness raising campaigns for farmers were systematically organized. Innovative experiments carried out outside Europe, in particularly arid regions, such as in Egypt, were used as sources of inspiration to match successfully agricultural development with the scarcity of water resources.

Action was also taken in the sector of tourism. Large-scale tourist projects in coastal areas dedicated to mass tourism were abandoned. Solutions were looked for in the case of existing resorts threatened by water scarcity. Reconversion programmes were elaborated to promote the quality and diversification of supply in order to avoid the concentration of tourist frequentation in summer time when water scarcity is highest. Specific facilities and utilities were developed, combining hinterland tours, pedestrian and cycling activities, heritage-related and other cultural activities etc. In mountain areas, the relative decline of winter tourism was compensated by new forms of summer tourism more diffuse and less damaging for the environment.

Agriculture and forestry were not only re-considered from the perspective of their relation to water resources, but also in relation to the maintainance of landscapes and vegetation. The search for new forms of cultivation followed also the objective, in addition to water saving, of maintaining and safeguarding agricultural activities in the southern European regions, in order to protect landscapes from wild vegetation, drying in summer time and prone to fires. The management of forests was significantly improved with the implementation of important prevention measures against fires. This included also the promotion of specific tree species, less sensitive to drought. Despite the intensification of such measures, forest fires occurred. In such cases, new afforestation measures were undertaken in order to avoid soil erosion and to favour the captation and retention of humidity.

The development of renewable energy sources was considered as important because the increase of average temperature has significant impacts on energy demand, in particular in summer time. The objective was to reduce electricity demand from hydro-electric, conventional oil or gas fired power plants as well as from nuclear power plants. To this end, solar and wind energy were significantly promoted and generalized. This made possible the saving of water in mountain and river barrages and to limit the emission of greenhouse gas. An additional advantage was that imports of electricity from northern and central European regions could be restricted.

The prevention of flood damages was another important priority, both in northern, southern and central European regions. The experience gained during the period 1995-2005 was used to generalize solutions. A number of measures were developed such as the extension of retention areas for water along rivers, the construction of new dikes to protect settlements, the removal of settlements unlikely to be efficiently protected against floods, the enforcement of measures prohibiting constructions and economic activities other than agriculture in areas threatened. In addition to these measures, specific radar-based weather forecast facilities were developed in Mediterranean regions to inform the population in due time about the occurrence of heavy rainfalls, so that necessary actions can be taken to protect human and animal lifes.

Transport policies had to be re-considered from the point of view of greenhouse gas emissions. New technologies were promoted in order to limit the consumption of fossil energy, especially oil. New types of engines were developed, using less energy as well as other types of fuels. Hydrogen powered engines were experimented, developed and promoted. The problem remained that of the production of hydrogen which is energy intensive. Electricity from renewable energy sources was used to produce a part of the hydrogen needed. It proved to be more difficult to influence the use of trucks and motor cars. Modal shift policies were not so successful as expected. Nevertheless, more and more people were inclined to use public transportation, the quality of which had been significantly improved and the transport of goods was partly shifted onto railways and maritime routes.

By 2015, the strategy was considered as rather successful. The number of natural hazards related to climate change had increased, but their impacts had been relatively contained. These encouraging results led to a generalization in the implementation of the strategy. The reform of structural policies in 2013/2014 was again used to increase the volume of resources devoted to the prevention of risks and damages related to climate change, considering that the overall economic benefits were substantial.

2.8.2.3.5 Impacts

Macro-economic impacts

Although the implementation of the strategy absorbed significant amounts of resources, in particular during the first decade of its implementation, the amount of benefits, especially the long-term ones, has been significantly higher than costs. The maintain of adapted forms of agriculture and tourism in the southern European regions, as well as the development of more indigenous forms of energy production and the reduction of external energy dependency contributed most to the economic benefits.

Regional, territorial and environmental impacts

At macro-scale, the contrast of impacts of climate change between southern and northern Europe remained limited. Migration flows of people from northern Europe towards Mediterranean regions (mainly retired people) were reduced, but did not stop, while emigration from southern regions towards more northern regions was contained.

At meso-level, changes were also much less significant than under Scenario 1, although some changes were unavoidable. The changing water regimes of rivers in valleys and plains, conditioned by changes in the hydrologic systems of mountain areas, could unfortunately not be improved, but water-saving techniques in agriculture and energy production reduced the negative impacts of changing water regimes of rivers. Rural-urban relationships remained rather balanced, due to the fact that rural areas did not lose their vitality in southern Europe. In central and northern Europe, pressure on rural areas was less intense.

At regional/local scale, damages caused by floods in the whole of Europe could be significantly contained, although the occurrence of floods increased. In southern European regions, landscapes could be safeguarded and the impacts of forest fires remained limited. Success in the management of water resources and in renewable energy production opened

new development perspectives. The containment of road traffic, especially the reduction of greenhouse gas emissions which it generates, acted positively along the objectives of the Kyoto Agreement.

2.8.2.3.6 Final image

By 2030, natural hazards related to climate change had significantly increased, if compared with the situation prevailing in the early 2000s. The impacts of such hazards were however contained and the European territory had become significantly more resistant against floods, drought, forest fires etc.

A number of changes had taken place, when compared with the situation in 2005, in particular with regard to vegetation and ecosystems. Mediterranean vegetation had progressed towards the north. Ecosystems had significantly changed in nature, but disruptions remained limited.

Intensive agricultural production moved north- and eastwards into Southern Scandinavia and the Baltic States. Southern European regions became famous for the techniques they had developed to cope with climate warming, in particular in the fields of integrated approaches in water management, renewable energy production, maintenance of rural landscapes, development of new forms of tourism in coastal, rural and mountain areas.

2.8.2.3.7 Main issues resulting from the scenario

Even if climate change is a fatality, a number of prevention and mitigation policies can enable the containment of negative impacts and the limitation of impacts of generated natural hazards. Through various well conceived and integrated policies, the European territory can be made more resistant to the impacts of climate change. A number of opportunities generated by climate change can also be exploited.

2.8.2.3.8 Summary

Climate change has been notable throughout Europe in the 2005-2030 period. Southern Europe was most severely hit, particularly by droughts and heat waves. Water shortages, misharvests and forest fires were among the most severe consequences. Northern Europe was mostly affected by floods, but faced increasing opportunities for agricultural expansion as well.

However, widespread adaptation policies to climate change have been successful to such an extent that damages have been far less than they could have been. The EU embraced the idea of structurally adapting territories to new climatic conditions. In Southern Europe this meant a structural change of agricultural sectors, shifting to heat resistant, low water demanding crops and efficient water supply systems. Agricultural and forest systems were developed that enabled the maintenance of dry Mediterranean landscapes, reducing risk of desertification and improving water retention capacities. Large scale tourism projects were abandoned and replaced by more specific tourist sectors like nature and culture. Adaptation to water shortage and mitigation of greenhouse gas emission encouraged the development of renewable energy sources throughout Europe. In Northern Europe, flood risks were widely combated by migrating economic sectors from most vulnerable river plain areas, hereby extending river beds.

As a result, negative consequences of climate change were largely contained. The cost has been that certain areas in Southern Europe and mountainous areas have seen income decreasing, because certain sectors (intensive winter and summer tourism, certain agricultural sectors) had to be given up. On the other hand, a knowledge economy on innovative agriculture, water management and landscape management has evolved, and rural areas are not further depopulated.

Concerning mitigation, strict agreements on emission reductions led to severe transport policies. Despite ever growing transport figures, promotion of clean technology managed to maintain emission levels. Public transport, railways and waterways became more important.

In 2030, mitigation measures up till then were highly insufficient. The climate change process will continue in the same pace or even accelerate, leading to many more severe damages in the 2030-2100 period.

2.9 Social-cultural issues

Due to time constraints, this section has not yet been subject to discussion within the TPG. It is therefore to be considered as a very preliminary draft, showing possible directions of the scenarios.

2.9.1 Scenario base

2.9.1.1 Sources of information

The scenario base results from a compilation of information from the following documents:

- 'Third Cohesion Report'. European Commission. 2004.
- 'The spatial effects of demographic trends and migration'. ESPON Project 1.1.4. ITPS. Swedish Institute for Growth Policy Studies.
- 'Observatoire National des Zones Urbaines Sensibles. Rapport 2004'. Paris
- 'The English Indices of Deprivation'. Office of the Deputy Prime Minister. London. 2004.
- 'Globalisation or regionalisation?'. NIC 2020 Europe Group Driver Paper. Budapest. 2004.
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- 'Inner-city misery. Real and imagined'. Guy Baeten. City. Vol.8. N°2.
- 'Lifestyles and the environment'. C. Harrison; G. Davies. ESRC Global Environmental change Programme. University College. London. 1998.
- 'Lifestyles, mobility and the challenge of sustainability. A survey of literature'. L. Hilty; A. Vollmer; D. Schulthess; T. Ruddy. Solothurn University of Applied Sciences. 2000.
- 'Changing consumption patterns and new lifestyles in the 21th century'. H. Nitto, J. Shiozaki. NRI Papers. 2001.
- 'Europe: expectations and reality'. Reports of the Second European Social Science Conference. Slovak Commission for UNESCO. Bratislava. 1999.
- 'Communication of the Commission on the Social Agenda' COM(2005)33 final. European Commission. 2005.
- 'Communication to the Spring European Council: working together for growth and jobs. A new start for the Lisbon Strategy'. European Commission. 2005.
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- 'Modernising the European social model'. European Commission. 2003.
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- 'Cultural identity and political responsibility'. N. Burgi-Golub. Cultural Policy. Vol. 0. 2000.
- 'L'impératif de la sécurité culturelle dans l'Europe morcelée'. E. Delgado (1995).
- 'Culture, identity and regional development in the European Union'. J. Süssner. Informationen zur Raumentwicklung. Heft 4/5. 2002.
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2.9.1.2 Introduction

Socio-cultural issues are as numerous and as diversified as European society itself. They include a wide range of factors which strongly interfere with demography and economy, but have their individual characteristics and dynamics.

They are related to 'large-scale' issues such as the impact of globalisation on the lifestyles, the relationships between ethnic or religious groups, immigration from outside Europe and also terrorism. They also concern the increasing social divide with its growing negative impacts in the field of poverty, social exclusion and crime. The transition which has taken place in Central and Eastern Europe from the former communist regimes towards democracy and market economy has been accompanied by a thorough transformation of socio-cultural values and systems. A number of issues have more regional or local roots, in particular in the case of cultural and ethnic minorities. Most socio-cultural issues have strong territorial impacts. These are generally more contrasted than the impacts of economic issues, in particular in towns and cities (see point 3.1.3 of Part 3, on health indicators).

Numerous public policies aim at alleviating socio-cultural problems, such as social and health policies, housing and urban regeneration policies, cultural policies, education and vocational training etc. The number of EU policies which interfere with socio-cultural issues is more limited: these are mainly the employment and training policy, the regional policy (including the URBAN Community Initiative), the environmental policy, the cultural policy, the justice and security policies. Important debates take also place at EU level which have impacts on socio-cultural issues, such as those on immigration, security etc.

2.9.1.3 Impacts of globalisation on socio-cultural systems in Europe

The progress of globalisation is obvious. The international trade system reaches almost everybody. The Internet is becoming a geographically global system, although it leaves out the largest part of the world population which is under the poverty threshold. The term 'globalisation' is often used by people to express the idea that something overwhelming, beyond their own horizons of experience and control, happens to them, which they cannot govern. People consider themselves as passive victims. This is frequently related to employment issues. Production systems are structurally interdependent at world scale, with a significant amount of European enterprise relocations outside Europe.

Opinions about the impacts of globalisation on socio-cultural factors in Europe are however strongly diverging. On the one hand, the most widely spread opinion is that in a global society, the risk is high that Europe has no identity any more. According to this approach, the universal force behind globalisation is considered to be technology, because it is a resource mainly devoted to economic profit or to control of power. It is changing people's life globally, their customs and institutions and their views of the future. The human

existence perspective is being narrowed by the technological imperative to concentrate on economic and political utility.

Others argue that Europe has the ability to become a key actor in the globalisation process thanks to its human capital stock, its history of overcoming intercultural tensions and its environment-friendly attitude. A fact is that Europe is already using its deep historical roots to resist globalisation. How the globalisation process will be seen in European eyes will depend less on the globalisation process itself and more on Europe's role in it.

A particular characteristic of the globalisation process has to be seen in relation to culture. The internal stability of the emerging global socio-economic system is being jeopardised by the fact that various societies are being unevenly integrated into the global system, the economy being far ahead of culture in terms of integration. This results in local socio-cultural instability, where a perceived or real danger of weakened identities prompts local cultures to 'defend' themselves from the emerging global culture. The widespread anti-globalisation movements and even the revival of religious fanaticism are all signs of this problem.

If Europe wishes to play a major part in the globalisation process and protect and strengthen its own identity, it should pay particular attention to its 'neighbourhood policy'. Compared with other large regions in the world, Europe stands out in its potential to integrate the economies in its geographical neighbourhood. The human capital of EU's neighbourhood (Ukraine, Turkey, Maghreb, a number of Middle East countries) is significant in quantitative terms. Should Europe be able to access and integrate in one way or another its neighbouring human capital stocks, it would not only contribute to large-scale stabilisation in the region, but also build a powerful economic block at world scale. In this respect, Europe would have a stronger weight in shaping the process of globalisation.

2.9.1.4 Socio-cultural transformation related to the transition process in Central and Eastern Europe

The transformation of the system of socio-cultural values and institutions which has taken place in Central and Eastern Europe has been characterised by such intensity that it hardly can be compared to the socio-cultural changes which have taken place in Western Europe during the past decades.

The transition period in many countries of Central and Eastern Europe has caused huge changes in the social and political systems, the socio-economic conditions, the moral and ethical rules as well as in the system of values and orientations. This transition was based on two paradigms of change. While the first transformation from 'real socialism' to democracy and market economy seems gradually to lose its importance, the second paradigm from the industrial-agricultural system towards the post-industrial service and information society is obviously more long-lasting. A kind of mimetic modernisation can be observed, which attempts to imitate the 'leading societies'; both at the level of institutions introduced from above and at that of new patterns of thinking, evaluating and behaving, which develop from below.

One of the characteristics of the former communist regimes was the alienation and the subordination in social life of the vital needs of the citizens, due to the dysfunctional character of socialist society which was responsible for the perversion of social reality. It should not be overlooked, however, that certain forms of solidarity among citizens at the level of family, relatives, neighbours etc. had developed outside the institutional system, which have been severely affected by the transition process.

After a short period of enthusiasm in the early 1990s (mass expectations for fast achievements of a high standard of living and of unfolding of individual initiative and personal success), the transition period has been characterised by a deep economic crisis and the difficult emergence of new social structures. The uncertainty of the present and the unpredictability of the future contributed to the formation of a mass consciousness crisis marked by the dominance of material values, the minimisation of expectations, the limitation of personal goals and aspirations. The uncertainty of social processes and the insecurity of social life left a deep mark on the outlook of personal orientations.

The past decade has been characterised by a significant social divide of East-European societies, with a significant increase of impoverishment and unemployment of large segments of the population and by high levels of crime which have become the parameters of the macro-social environment, limiting the attention and efforts of the people in the sphere of everyday life. The share of people who adapt with difficulty or are not capable of adapting to social changes is relatively high.

An unexpected change in lifestyle and quality of life has generated lower living standards that endanger the vital functions of the family. In many cases, one job, even at the level of university professor, does no longer suffice to feed a family. Many people have second and third jobs besides their regular work. The share of population living below poverty line is in various countries significantly higher than 20%. Mortality rates of population in working age has increased since 1990, main causes being poverty, drug abuse and suicide. The number of one-parent families has dramatically increased. Security problems have become significant. People avoid riding the train for fear of robbery. All these factors have led a large number of people to a retreat into the narrow frames of everyday life, to personal and group isolation, to social alienation and to distancing from macro-social processes.

While at the beginning of the 1990s mass consciousness still used to be dominated by traditional value affiliations, such as labour, the expanding influence of competence, professional skills and entrepreneurship are now associated with the new models of effective activity and development under the conditions of market economy and democratic political systems. These qualities are typically internalised by the younger and better educated generations. Moreover, key social values are weathered. The chances for success are frequently associated with fraudulence, ruthlessness and unscrupulousness. This unambiguously speaks for cultural contradictions and for deepening value disorientation.

People's aspirations towards the state are strongly contradictory. On the one hand, the state is expected to steer a strong social policy and take protectionist measures regarding persons and groups in an unfavourable social position, but the state does not dispose of the resources to meet such expectations. On the other hand, a broadening of individual rights and creation of opportunities for an unlimited freedom of private initiative are demanded. Not fulfilled expectations lead to the emergence of a culture of mistrust in political institutions as well as in non-governmental organisations (political parties, trade unions, civic associations).

It must however be considered that wide differences exist in the socio-economic and socio-cultural situations of the various countries of Central and Eastern Europe. The levels of social divide, poverty, criminality etc. vary largely from country to country. It must also be stated that democracy, despite social divide and tensions, is by now the object of a large consensus among the population, which does not exclude the resurgence of various forms of nationalism.

2.9.1.5 Multiculturalism in Europe

Multiculturalism is a concept with a double significance. On the one hand it characterises a society composed of various cultural groups (ethnic, religious groups etc.), which is then denominated 'multicultural society'. On the other hand, it designates public policies aiming at preserving and promoting the cultural identities of the various groups composing society.

It is a common sense that Europe has progressively become, over the past decades, a multicultural society. The most important factor has been sustained immigration from outside the EU and largely from outside Europe (North Africa, Black Africa, Middle East, Asia etc.). Although their importance varies among European countries, large ethnic and religious groups of non-European origin are present all over Europe and their size is increasing because of both continuing immigration and higher birth rates than in the native European population.

Within the EU itself, considering the native European population, it cannot be overlooked that significant cultural differences also exist, for instance between the Iberian and Slavish populations, or between the Nordic and Mediterranean people. As a policy concept, multiculturalism has become an issue within the EU, with the growing emancipation of previously marginalised national and ethnic minorities and immigrant communities.

In the former communist context, multiculturalism was understood as something occurring only within the borders of Yugoslavia and Soviet States. Other rich intercultural relations which, during the past centuries had built deep foundations for different forms of multiculturalism, were severed by the Iron Curtain and ignored by the official, ideological discourse. In Central and Eastern Europe, multiculturalism was strangled under totalitarian monoculture. The collapse of the communist systems released many centrifugal forces in some regions of the multi-national states. The end of ideologically-defined states has reactivated traditional ethnic and religious identities. While the worst consequences of this multi-cultural revival, associated with growing nationalisms, led to the Balkan wars during the 1990s, the present-day concept of multiculturalism in the post-communist states such as Slovenia, Croatia, Hungary, Slovakia, Czech Republic, is based on the strong civilisational, social, ethnic and historical links with other nations of Central Europe and its concept of multicultural regionalism. The breakdown of communism and the political independence of these countries made possible a radical re-conceptualisation of multiculturalism.

2.9.1.6 Transformation of lifestyles

Lifestyles are patterns of actions that differentiate people. Lifestyles map onto conventional social categories of class, income, age, gender and ethnicity, but also transcend them. Lifestyles are about identity choices.

During the decades of high economic growth in the post-war period, the western world experienced consumerism as the dominating lifestyle. This period has been highly detrimental to the environment. During the 1980s and 1990s, lifestyles have changed under the pressures of economic constraints and growing unemployment. Environmental consciousness started developing during that period. In the same time, a number of factors led to strong differentiation of lifestyles in Europe (growing immigration and related cultural differences, people ageing), while others of more global character (technological developments in the field of media ICT etc.) caused stronger homogenisation of certain aspects of lifestyles. Demographic changes have important impacts on the lifestyles. There are for instance clear indications of increasing mobility and different consumption patterns of the aged. Growing ethnic heterogeneity, associated with specific socio-economic

characteristics also has a strong footprint on lifestyles. In a society often regarded as highly fragmented and individualised, lifestyles can also be new means of negotiating 'space' between the private and the public, demonstrating the active and engaged processes through which people construct their identities in relation to their lived experiences.

2.9.1.6.1 *Changing consumption patterns*

The growth in information intensification is providing society with a host of new means for both information collection and communication, leading to major changes in consumer lifestyles. Under the influence of economic globalisation, international experience is becoming an increasingly common phenomenon among the life of average people. It is virtually certain that such international experience affects lifestyles, consumption patterns and basic values, spurring attempts by an increasing number of people to replicate foreign cultures, concepts, consumption patterns and lifestyles.

More and more people in Europe are coming to the awareness that an ever-improving economy can no longer be expected. They design their lifestyle without the expectation of continuing economic growth and therefore pursue security and adopt a more passive, but rational attitude towards consumption. In this respect, a particular trend is towards convenient and comfortable products. Quality is progressively becoming more important than quantity and volatility. Commercial product ownerships is reaching a mature stage, although this still strongly varies among social and ethnic groups.

Changes in consumers' values are clearly characterised by increases in consumer-price sensitivity and a compare-before-buying attitude. This strong inclination to search for value and economy in buying goods has largely benefited from ICT resources and particularly from the Internet. As a means of arming themselves for self-protective consumption, consumers collect a wide range of information directly from manufacturers and/or distributors. ICT tools have provided new avenues of communication between companies and consumers and have accelerated the process by which consumers can acquire by themselves the information they desire.

Another important trend is greater acceleration of fashion trends. In recent years, the powerful transmitting capabilities of ICT-related equipment have made possible to quickly emulate actions taken by others, even in distant locations and small numbers. As such, concerted actions taken by a number of people can have a major and far-reaching impact on others, thereby exerting a multiplier effect within the broader society.

A third important trend is the growth in consumption under the influence of groups. While marketing strategies traditionally recognise that consumer decision-making is subject to three core factors: the aging effect (the age of individuals affects purchasing decisions), the generation effect (members of the same generation share common traits and beliefs shaped by their social environment) and the time effect (fashion effect, regardless of an individual's age), communication networks have become more diversified as individuals are broadening their contacts with a wide range of groups. Diversification of networking groups has become a fourth effect. In purchasing goods, consumers are also subject to the influence of the groups to which they belong.

Another important factor in consumption trends is that households' consumption is socially shaped. The role of formal and informal institutions surrounding consumers should not be underestimated. In the past decades, ecological awareness, paired with democratic institutions, has been instrumental in bringing about changes in production, products and consumption patterns. It has curbed, but not more, the tremendous waste in manufacturing, marketing and usage of the products. People have, by and large, accepted

these changes, possibly because very little has been called for in terms of changes in lifestyles.

An increasing trend can be observed towards ecological and ethical consumption, giving preference to the use of quality products with significant longevity, generating greater well-being while using fewer resources such as energy and raw materials. This trend is slowly progressing in a context of tensions between the assertion of consumers' autonomy and power and the need to minimise consumption. It reflects the need to bring closer together individual desires and individual self-interest, taking into consideration a longer time frame.

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

2.9.1.6.2 *Lifestyles in relation to mobility*

Mobility is undergoing important structural changes which have significant impacts on lifestyles. In general terms, people's mobility has been steadily increasing and diversifying as far as purposes are concerned. On the other hand, the development of ICT is also important in terms of mobility. While in many respects telecommunication can be substituted to physical mobility, the increasing flows of information accessible through the Internet generate needs for higher mobility.

As far as work-related mobility is concerned, a number of contradictory trends exist. The globalisation of production and trade systems increases the long-distance mobility of professionals. At local level, commuter flows are also growing in distance and in volume as a result of progressing suburbanisation.

On the other hand, telework and homework are also progressing and have a clear impact on the reduction of mobility. In terms of lifestyles, the main perceived advantages of telework and homework are higher flexibility, greater time freedom to organize work and leisure periods, private and quiet atmosphere, fewer interruptions and greater efficiency and productivity, better integration of work and family. The main disadvantages appear to be the loss of interpersonal communication, social isolation and loneliness, the fear to be cut from the company's information flows and the lack of contacts with superiors, colleagues and customers.

Teleworking and homeworking will continue to spread in the world of work, whereas teleworking will be more and more substituted by homeworking: employees are turning into contractors and salaried people becoming self-employed.

Increasingly, consumption and entertainment-oriented lifestyles are important factors driving the growth on non-work-related mobility. This trend spreads more and more also towards lower income households, implying a change in lifestyles as well. Cultural forces of change are at work which influence the development of leisure-oriented mobility.

2.9.1.6.3 *Impacts on lifestyles of changes in leisure patterns*

The lifestyles of Europeans with regard to leisure activities have undergone some substantial changes over the past few decades. Increases in disposable income, at least for a part of the population, and related consumer expenditures have brought about steady growth in leisure markets. This growth in demand has been sustained by the continued development of products that have relied for their success on technical developments such as CDs, videos, DVDs, the Internet and digital radio and television. New forms of consumerism are however more orientated towards the consumption of services and less towards the consumption of goods, as it happened to be from the 1960s to the 1980s. Changes in leisure lifestyles have in this respect been supported by the development of concepts such as branded restaurants, multiplex cinemas and fitness centres that have relied less upon technical progress and more on innovation in organisational and marketing expertise.

Demographic changes have also influenced the balance of demand for different leisure products. Of particular note are the changes that have taken place in the age structure of the population and in household composition, with the population becoming older and households becoming smaller. Mobility of elderly for leisure purposes has significantly increased.

Other social changes that have taken place over the past 25 years include the feminisation of leisure resulting from an increase in women's disposable income and a consequent opening up of new markets for female special interest activities (e.g. health and fitness).

Patterns of work have also been changing significantly, leading to increased pressure on time and encouraging a greater variety of leisure activities. A significant impact on mobility is resulting from this, with travels during a larger number of longer week-ends and more numerous, but shorter holiday periods. The decreasing price of air fares encourages long-distance leisure mobility.

2.9.1.6.4 *Impacts on lifestyles of the erosion of social trust and of self-protective attitudes*

During the past two decades, a crisis has progressively developed in Europe with eroding impact on social trust. Social institutions and public organisations are facing a sharp loss in public confidence. In addition to the crisis of the welfare state, people face growing uncertainties and fears, such as higher unemployment rates, worsening public safety and increasing crime. An increasing number of people feel that they cannot get a decent job, even if they work hard. The perception of equality has been eroded and advancing hierarchies, based on and strengthening the social divide, are undermining the traditional occupational openness.

All these changes point in the direction of developing more self-protective attitudes. A noticeable change concerns the pattern of communication. People are trying to expand their personal communication networks by not only maintaining close relationships with families and relatives, but also extending communication links to as many people as possible to acquire information from a wide range of sources or to find others they can rely on for support. This self-protective attitude can also be seen as a type of risk-hedging, as people wish to improve their living standards and to find others who can provide the support they need for emerging situations or for daily necessities. Progress in ICT is supporting this diversification in human relationships.

2.9.1.7 Issues related to the concept of social cohesion

2.9.1.7.1 Access to employment

Access to employment is of key significance for social inclusion, since it determines in most cases whether people are able both to enjoy a decent standard of living and contribute fully to the society in which they live. For those of working-age, having a job or being able to find one within a reasonable period of time is therefore invariably a precondition of social inclusion. While the proportion of those of working age in employment has increased in most parts of the EU-15 over recent years, in the new member countries, by contrast, their proportion in jobs has tended to decline. Unemployment has become a major problem in many of these countries. In regions where unemployment is high, it remains the case that young people and women are particularly affected and those becoming unemployed tend to be out of work for a long time.

The Urban Audit indicated that there is general pessimism in the labour markets of cities. Despite the concentration of jobs in cities attracting many commuters, city residents do not find job hunting an easy process. In fact, despite the availability of jobs, unemployment rates are also higher in cities than in the suburbs. There is however considerable variation between cities.

2.9.1.7.2 Poverty and social exclusion

Poverty is a multidimensional issue. It may refer to material conditions of the poor (needing goods and services, multiple deprivation, low standard of living), to their economic position (low income, limited resources, inequality or low social class), to their social position (lack of entitlement, dependency, social exclusion). Absolute poverty is defined as a condition characterised by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information. It depends not only on income, but also on access to social services. Relative poverty is based on a comparison of poor people with others in society. It is defined in terms of the society in which they live.

Because there is no agreed definition of poverty, there can be no agreed measure. Some nations use 'budget standards', estimating the cost of a minimum basket of goods. Others use relative measures. The European Union uses a comparative measure which sets a poverty line at 60% of the median income. This means that there is more poverty where there is more inequality or greater 'economic distance'.

Although there are no measures of the number of people across the enlarged EU who live in poverty in an absolute sense, an indication can be gained of those whose income is low enough to put them at risk of being socially disadvantaged, in a relative sense. Some 15% of the EU-15 population (or over 60 million people) are living below the poverty line, though poverty rates vary widely across the EU:

- Denmark, Finland and Sweden had the smallest gaps in income distribution between the top and bottom 20% of society in 1999, whilst,
- Greece, Portugal and Spain had the widest income gaps, according to the 2003 Spring Report of the European Council;

- Denmark, Luxemburg and Finland had the lowest score for at-persistent-risk of poverty rate in 1999 whilst,
- Greece, Ireland and Portugal had the highest, according to the 2003 Spring Report.

According to data of 2000, the proportion of the population at risk of poverty (defined in terms of those living in households with income below 60% of the national average after social transfers) ranges from 21% in Ireland and only slightly less in Greece and Portugal to 10-11% in the Netherlands, Sweden, Germany, Denmark and Finland.

Poverty is closely linked to unemployment. Only 7% of the employed population in the EU had income below the poverty line in 2000, as against 38% of the unemployed and 25% of the inactive.

The risk of poverty is higher for particular household types in most countries, in particular for older people living alone and lone parents. In the EU-15 member states, some 35% on average of those living alone with dependent children (the vast majority of whom are women) and almost 30% of people of 65 and over living alone, have income below the poverty line.

Wide variations exist across the Union as regards the nature, as well as the scale of the problem of low income. In the southern countries, apart from Greece, the problem is related to having children, which is also the case in the Netherlands as well as in the UK for lone parents in particular. In the Nordic countries, it is mainly associated with living alone, while in Ireland and Portugal, it is a particular problem among those of 65 and over.

The risk of poverty and social exclusion is also important in the new member states. This risk threatens to increase if unemployment remains high. The risk of poverty affects ethnic minorities in particular who tend to be disadvantaged on the labour market. In some cases, they face cumulative handicaps in terms of access to education, social services, housing and health care. Most new member countries have significant ethnic minorities.

Social exclusion is a very broad concept which includes not only deprivation, but also problems of social relationships, including social isolation and failures in social protection. In practice, exclusion has a financial dimension (poverty) and, possibly, a relation with the labour market (long-term unemployment). People are considered as socially excluded when they are not part of the networks which support most people in ordinary life: networks of family, friends, community and employment. Among many others, poor people, ex-prisoners, homeless people, people with AIDS, people with learning disabilities or psychiatric patients might all be at risk of exclusion.

2.9.1.7.3 *Housing problems, homelessness and urban deprivation*

In large parts of Europe, the most basic problem is a shortage of adequate housing, although most European countries have a crude surplus of houses over households. The apparent surplus includes, however, large numbers of properties which are unfit to live in. When these are excluded, the result is a net shortage. This does not take account of other reasons for shortage, like second homes, housing in the wrong place or the need for a vacancy surplus so that people can move house.

The Urban Audit indicates that Europe's city dwellers are rather pessimistic about housing. Unsurprisingly, there is a clear inverse relationship between availability of jobs and availability of housing. Cities which find it easy to offer jobs experience higher housing

prices. The same is true when cities offer other amenities. Cities with high perception of amenities tend to be more expensive.

Because housing operates in a market, the people who are most likely to be left out will be those who have the least resources. They cannot obtain accommodation, or have to live in unfit accommodation. The shortage also leads to increasing prices, creating problems in the supply of affordable housing.

Homelessness is a complex problem and the circumstances under which it develops vary greatly. The main issues identified are shortages of housing excluding the poorest people, stronger controls prohibiting squatting of land and houses, specific social problems of the people concerned (alcoholism, psychiatric illness, unemployment, marital breakdown, poverty).

Housing issues generally are issues in deprivation. Deprivation is often concentrated. Slum estates occur in both the private and the public housing sector. In the private sector, people are brought together through market forces. Those least able to exercise choice end up in the places least to be chosen. The same is true, up to a certain extent, of the public sector. Where applicants for social housing are allowed a choice, the people most able to exercise that choice are those who have the highest income and the best housing previously. They are the ones who can wait for a better offer.

The 'worst estates' are largely related to issues of social exclusion. Their problems are the problems of poverty. People who are poor live differently; they are stuck at home more, they cannot afford enough heat etc. Typical problems in poor areas are inadequate play space combined with educational problems, accumulation of rubbish, problems of home maintenance, lack of community facilities, empty housing (bad houses), vandalism, crime and insecurity.

It should not be overlooked, however, that inner cities and other urban deprived areas, where 'social exclusion is concentrated, equally function as 'spaces of inclusion' for those societal groups that are not accepted by mainstream society. There is evidence that people living in such areas, irrespective of their poverty, may set up a wide array of meaningful social, cultural and economic networks which enable them to enter the labour market, to develop mutual support activities and to participate in cultural activities of all kinds. Part of the problem of inner-city poverty is in fact sometimes its over-problematisation.

2.9.1.7.4 *Specific problems of the elderly*

There are increasing numbers of elderly in Europe. Many have no problems, but there is a risk of increasing dependency. The main reasons are:

- Sickness. The health of old people is often poor, not simply because of age, but also because diet, housing, occupation and lifestyles in previous times have not been conducive to good health;
- Physical disability (arthritis etc.)
- Mental impairment (dementia)
- Poverty

Other problems may include isolation, housing conditions which may be deteriorating, scarcity of carers etc.

2.9.1.7.5 Gender equality

There are still important differences in the opportunities offered to and constraints faced respectively by men and women in the present European society:

- Women have gained the most from the rise in employment rates in recent years:
 - More than 6 out of 10 new jobs created between 1997 and 2001 were taken up by women;
 - Female employment rose by 2.1% from 1999 to 2001, compared to a 1.7% rise for total employment;
 - Female employment stood at 55.5% in 2002, compared to the male employment rate of 72.9%
- But there are still more women than men out of work
 - Female unemployment stood at 8.7% in 2002, compared to the male unemployment rate of 6.9%;
 - Female unemployment exceeded total unemployment by 1% in 2002;
- The pay gap persists:
 - The differential between male and female hourly gross earnings averaged 16% in 1999 and was highest in the UK and Ireland;
- Level of professional responsibilities:

Less than 9% of women in paid employment had supervisory responsibilities and less than 16% had intermediate responsibilities in 1998 compared to 16% and 19% for men.
- Work and family:

Experience shows that Member States having comprehensive policies to reconcile work and family life for both men and women show higher fertility rates as well as higher labour market participation of women.

In conclusion, despite the slowdown in economic growth during the last few years and the limited employment growth, a positive trend towards closing gender gaps could be observed in education and employment in the enlarged EU-25, while the pay gap between women and men remains almost unchanged.

The gender gap in overall poverty risks appears limited. Nevertheless, elderly women still have higher risks of poverty than elderly men. Furthermore, single parents, mostly women, tend to suffer from cumulative disadvantages and are particularly vulnerable to social exclusion.

There is little evidence of progress in closing the pay gap, which remains stable in the EU-15 at approximately 16%. The estimated figure for EU-25 is slightly lower. The EU average amounts to 15% when the pay gap in the New Member States has been taken into account.

2.9.1.7.6 Social impacts of demographic challenges

There are presently and for the decades to come, two basic challenges related to demography: population ageing and increasing immigration into the EU. The changing demographics of the EU, but even more so the changes on the labour market and in family structures, produce pressures towards the transformation of social protection systems.

The ratio of people over 65 to people of working age will double between now and 2050, from one to four today to one to two in 2050. Public pension spending is set to rise from just over 10% in 2000 to 13.6% in 2040. In 2050, it is estimated that there will be some 38 million people aged 80 and over in the EU-15, compared to almost 14 million in 2000. Not only will much higher numbers of elderly people need care, but also different patterns of age-related and chronic illness are expected.

In 2003, immigration contributed to more than 80% of the total population growth in the EU-15. Recent inflows were dominated by families reuniting and asylum-seekers in most Member States. Immigrant women are lagging behind in labour market integration and this reflects the fact that the EU does not fully utilise the skilled female employment potential among immigrants.

The unemployment rate was more than twice as high among non EU-nationals compared to EU nationals. Immigrant men and women have similar unemployment rates, except for the high skilled where women tend to be unemployed more often than men. Women migrants are concentrated in low paid industries and occupations. The information available on wages shows that immigrant women are at a particular disadvantage. In 2000, while women in the EU on average had 16% lower pay than EU men, immigrant women (non-EU nationals) earned 10% less than EU national women. For men, the pay gap between EU-nationals and non-EU nationals was 4%.

The employment rate of immigrants varies according to the place of origin. Foreign born from other industrialised countries have a similar or higher employment rate and a lower unemployment rate than the EU average, while immigrants from other parts of the world have substantially lower employment and higher unemployment rates than the EU average. Differences in employment rates are largest among women.

One of the envisaged solutions to meet the challenges of an ageing society is the mobilisation of people to enter the labour market and the promotion of women's employment in all age brackets, but in particular in the older ages, as well as the utilisation of the female employment potential among immigrants. The challenge is also to close the gender pay gap and to facilitate reconciliation of work and family life for both women and men.

2.9.1.8 The role of regional identities in territorial development and socio-cultural integration

Regional identities are by essence a complex set of socio-cultural factors. Their impacts on territorial development and socio-cultural integration have to be scrutinised from several perspectives.

Regional identity has not been so far the subject of detailed definition or analysis but often, instead, simply appealed to in terms of an accepted universal good, the benefits of which are surely obvious to all. It is often supposed that regions provide a sense of identity, of place and of belonging necessary for social and regional sustainability.

In this context, a new development paradigm has emerged according to which strong regional identities favour territorial development. Regional identity is considered here as a substantial part of the so-called social capital, composed of numerous networks which provide a sense of community and generate a level of trust that is inherent in, but varies according to regional cultures. Regional and community networks include social relations, formal and informal social networks, group membership, reciprocity and civil engagement. Soft factors such as culture, civic society, identities and attitudes are of increasing importance in explaining regional variations in development, compared with more traditional structural factors such as differences in accessibility, demography, trade and industry.

Regional identities are strongly related to cultural factors. Identity is constantly defined, constructed and invented through culture. Identification with the region, combined with a distinct regional culture is seen as vital when striving at creating an atmosphere of trust, entrepreneurship and creativity among citizens. The presumption is that in an atmosphere of this kind, an innovative economic development is more likely to occur. The discourse on culture within the new development paradigm is however not primarily focused on supporting artistic creativity or improving the accessibility of culture to the citizens. Instead, it aims at strengthening the feeling of solidarity and symbolic community among them. The increased interest for regional history indicates that the interpretation of the past is an important element when defining the cultural particularity of a region.

The importance of regional identities is often mentioned as a counterweight to the strength of globalisation processes. Global economic restructuring and the changing capacity of the nation states have made the citizens turn to the regions as to the level better equipped to understand local problems and to find possible solutions. This relationship is however not unambiguous, because the globalisation of politics, economics and daily consumption has weakened traditional systems of identity manifestation. New 'resistance' identities are however developing, neo-regionalism being one of them, in addition to more suspect manifestations such as nationalism, religious fundamentalism or ethnicism.

In this context, regional identities can be made instrumental in many respects. A sense of regional identity within the population is a prerequisite for developing a positive image outside the region. Culture and history are simultaneously used as commodities, as central means to launch a positive image of the region and as something that can strengthen both the identity and the profile of the region. The development of region-wide facilities and events, particularly in tourism, recreation and travel contributes to the strengthening of a regional identity, but also in the process of marketing of the region. The economic utility of an effective branding is higher visibility of the region in markets where that recognition will lead to decisions to do business with the region. In peripheral regions, regional culture is commonly seen as a vital asset when striving to attract people and private enterprise to the region. For many of them, tourism has become the answer to the question of how their economies should prosper and glow. In seeking for a promising niche within the tourism trade, the concept of cultural tourism has been heralded.

Regional identity may also become an administrative strategy which helps to mobilise local powers for regional development. The promotion of regional identities has become a common element of numerous regional development strategies and not only in regions where clear deficit in regional identity can be observed.

Nevertheless, strong regional identities may also generate drawbacks and lead to shortcomings in development:

- where a strong and positive regional identity is instrumental in attracting population, workers, students and new growth, this is likely in turn to undermine existing identity because of the looser attachments newcomers have to the region and the wider attachments residents will develop;
- quite often, cultural policies have become a screen used by identity politics with the aim to occult the outgrowth of decades-long failures of governments to properly deal with large-scale social and economic distress in a number of regions;
- in other cases, cultural policies have had different adverse effects, such as encouraging enclave identities by stressing belonging to a particular ethnic, religious or linguistic group and tending to confine identity instead of opening it;
- European neo-regionalism of the 1990s has been described as modernising and forward looking, in contrast to old regionalism characterised by its provincialism and by a social or cultural agenda where claims for 'rights to roots' were central. It happens frequently, however, that a number of old values and features, inherited from the past, are still considered as fetishes by new regionalist policies while they act as mental obstacles that need to be removed if the region is about to develop;
- according to the neo-regionalist logic, common geographical origin is a reason for solidarity. Internal opposition and diversity are neglected and even counteracted due to the eagerness to bring out a common identity. Immigration –national or international – means that there are individuals in these regions who cannot find their 'cultural roots' there. Neo-regionalist ideology is generally ill-equipped to handle ethnic relations and problems of social marginalisation, sp prevalent in contemporary Europe.

Culture should therefore not be considered as an autonomous sphere and cannot be separated from the other realms of society. The social realm transcends and encompasses culture. Changes in social conditions and social standing inevitably lead to evolutions of cultural paradigms. In this respect, the search for a solution of continuity between past memories and future-oriented identity is an inherent problem of cultural policies. These should favour cultural hybridisation and free the minds to explore new pathways, considering that there is a dialectical interplay between the old and the new, between universality and particularity, openness and rootedness, integration and self-affirmation.

2.9.1.9 Interactions between socio-cultural factors and other sectors

Socio-cultural factors interfere with a large number of developments in economy and society, including the spatial manifestations of these transformations. Interferences can be found in particular:

- in employment and labour markets. Factors such as the level of education, ethnic origin, gender etc. act either as constraints or as opportunities for the inclusion of people into the labour market;
- in mobility. Mobility is a multi-dimensional concept (short versus long-distance; work-related vs. leisure-related; periodic mobility vs. migrations etc.). Mobility is in relation with lifestyles, income levels, cultural backgrounds, environmental consciousness etc.
- in the demographic evolution. Fertility rates of women, family structures etc. are strongly related to values, lifestyles, levels of education, ethnic or religious factors etc.

- in the environment. Lifestyles, cultural level, leisure and mobility patterns have strong impacts on the environment, in terms of pressures, land consumption, enhancement or destruction of the natural and cultural heritage;
- in the dereliction and deprivation of a number of urban areas. These are related to the level of social exclusion, poverty, immigration, aculturation etc.

This diversity of interferences result in the fact that numerous EU policies have impacts on socio-cultural structures of the European society.

2.9.1.10 Socio-cultural policies of the European Union

The European Community was founded for political and economic reasons. There were no clear social aims. Social measures followed from the pressures of economic policy. During the 1970s, the emphasis of Community social policy changed towards improving 'living and working conditions' in the Community and the idea of the workers was extended to include those who were not part of the labour force. Once it was accepted that the Community had social objectives distinct from the economic objectives, it became possible to expand the role of the Community in social policy.

The powers of the Union have progressed through incremental development of marginal, relatively innocuous measures in order to establish precedent and competence. For example, provisions covering cigarette packets, bus passes or language teaching sought to establish competence in relation to public health, old people, transport conditions and education. This has been resisted through the idea of subsidiarity, by which action should always be taken at the lowest level possible.

The Commission's approach to the development of socio-cultural policy is based on the incremental development of services, the progressive expansion of solidarity and the insertion of those who are excluded.

2.9.1.10.1 Employment-related EU socio-cultural policies

The European Employment Strategy, supported by the Social Fund, has three interrelated objectives: working towards full employment; quality and productivity at work and social cohesion and an inclusive labour market. To achieve this, the Strategy lays down employment guidelines, valid for the whole EU. Quality is the watchword: investment in education and training; schemes to help women, the long-term unemployed and older workers return to or remain on the labour market reduce unemployment and boost productivity.

Progress in labour law, health and safety and social dialogue have helped the EU to develop its social model. Faced with far-reaching changes in the economy and the labour market, new responses to improving working conditions are needed: fostering economic dynamism and innovation, ensuring social stability and accommodating the needs of those adversely affected by the changes. Involvement of workers in the process of change has been helped by the adoption in 2002 of a directive laying out a framework for informing and consulting employees in business within the EU. The Directive on temporary workers aims at safeguarding fair treatment and promoting flexibility in this growing segment of the labour market. The EU strategy on health and security aims at tackling the 500 million workdays lost annually in the EU due to work-related injuries and illness, at building on risk prevention and on a global approach to well-being at work. The EQUAL Community Initiative aims to find new ways of getting people into work by challenging existing examples: access and return to labour market; combating racism; business creation; social economy; lifelong

learning; adaptation to change; reconciling family and working life; reducing gender gaps; integration of asylum seekers.

The Social Agenda (2000) aimed at implementing the Lisbon Strategy with the objective to return to full employment. The Agenda has been putting forward new and better forms of governance of social policy. This means involving the different actors – unions, employers, local and national authorities and NGOs – more fully in shaping and implementing the policies and creating the right mix of policy instruments. The so-called open method of coordination used for employment and social policies steers policy-making by Member States. It provides a new basis for coordination, using comparisons and peer group pressure, backed by common guidelines, benchmarks and – in the employment field – recommendations. The new Social Agenda (2005) has two key priorities: employment and fighting poverty and promoting equal opportunities.

2.9.1.10.2 Non-employment related EU socio-cultural policies

EU cultural policy

It was not until 1991 that the EU officially began to deal with culture: under the Maastricht Treaty and its Article 151, the Union 'shall contribute to the flowering of the cultures of the Member States, while respecting their national and regional diversity and at the same time bringing the common cultural heritage to the fore'. Since the Treaty of Maastricht, European support for cultural cooperation took a variety of forms: initial experimental actions carried out by the Commission were followed, between 1996 and 1999, by three sectoral programmes (Kaleidoscope, Raphael and Ariane) covering the performance of visual arts, cultural heritage and literature and reading.

EU initiatives in the cultural sector aim at encouraging cooperation between Member States and, if necessary, supporting and supplementing their actions. The aim is to encourage the creation of a 'European Cultural Area'. Cultural cooperation is encouraged by means of the Culture 2000 Programme, but also by specific actions financed by other European programmes. These involve European cooperation in the broad sense, since the majority of the programmes are open to the Member States of the European Economic Area and to the applicant countries. This cooperation also plays an important role in the relations that the EU maintains with the rest of the world. The general objectives are to develop artistic and literary creation, to promote the knowledge of European history and culture and their international distribution and to develop heritage sites and collections of European importance as well as intercultural dialogue and social integration.

The Culture 2000 Programme contributes to the financing of Community cooperation activities in all artistic fields: performing arts, visual arts, literature, music, history and cultural heritage etc. Based on a budget of € 240 million for the period 2000-2006, this programme aims at developing the cultural diversity of the European Union, the creativity and the exchange between European cultural actors, while making culture more accessible to a larger public.

Other policies and programmes contributing to supporting cultural activities in the EU are, among others:

- **The structural policies.** The ERDF and EAGGF resources support projects concerned with building cultural facilities or renovating historic buildings or cultural sites with a view to their conversion into museums, libraries, concert halls, multimedia centres or tourist attractions. In addition to the contributions of the mainstream programmes, the Community Initiatives LEADER, URBAN and INTERREG contribute to the creation of cultural facilities, in particular through the exploitation of buildings, districts and sites as well as management and dissemination of cultural works in digital form.

- **The 6th Framework Programme for RDT** (2002-2006) which also stimulates European cooperation in the cultural field by financing European projects for the preservation of the cultural heritage, projects supporting other EU policies including culture, cooperation projects in the field of digitalisation of cultural contents as well as activities of mobility and of research worker's training.
- **The European education and training programmes** Socrates, Leonardo, in particular in the field of language training. Tempus favours cooperation in higher education between EU member states and partner countries (CARDS and TACIS countries in particular);
- **The Youth programme** which facilitates youth mobility and exchanges between young persons from 31 European countries;
- **The Erasmus Mundus** programme which supports cooperation and mobility in the field of higher education, promoting exchanges between the EU and third countries;
- **The MEDA programme** which contains a variety of measures working towards promoting the dialogue between cultures and civilisations;
- **Actions of DG Justice and Home Affairs** concerning the integration of immigrants (INTI Programme favouring the integration of third country nationals);
- **The European Neighbourhood Policy** which promotes, among other things, cultural cooperation with the enlarged EU's neighbours.

EU Public Health Policy

On 23 September 2002, the European Parliament and the Council adopted a Decision on the programme of Community action in the field of public health (2003-2008). This programme entered into force on 1st January 2003. The general objectives of the programme are:

To improve information and knowledge for the development of public health;

To enhance the capability of responding rapidly and in a coordinated fashion to threats to health;

To promote health and prevent disease through addressing health determinants across all policies and activities;

In 2002, the Commission proposed a new Community strategy on health and safety at work to cover the period until 2006. It builds on the knowledge that the absence of high quality occupational health and safety policy generates a significant economic cost.

c) EU policy aiming at eradicating poverty and combating discrimination

EU governments declared at the Lisbon Summit in 2000 that poverty in the EU is unacceptably high. They set the goal of making a decisive impact on eradicating poverty by 2010. Commission's plan was for Member States to coordinate their social protection policies within a single coherent framework. Under the plan, national action plans set targets for reducing the number of people significantly at risk of poverty and social exclusion with measures to help the most vulnerable as one of the priorities.

Non-discrimination is considered as important to tackle poverty and deprivation and bring the marginalised into mainstream society. EU legislation aims at combating discrimination based on race or ethnic origin, religion or belief, age, disability.

2.9.1.11 Driving forces

Driving forces in the socio-cultural field or with significant impacts in this field are in particular:

- the globalisation and European integration processes (unification of lifestyles and of cultural behaviour);
- progressing immigration into Europe, bringing with it different socio-cultural patterns and behaviours;
- technological evolution (impacts on consumption, leisure and mobility patterns; on employment/unemployment and social exclusion);
- population ageing, bringing with it different values, lifestyles, mobility patterns;
- EU-enlargements with the accession of societies which have been living prior to 1989/90 under communist regimes;
- socio-cultural integration policies at various levels; multiculturalist approaches.

2.9.1.12 ESPON core indicators related to the scenarios

- Households
- Household-oriented infrastructure
- Population growth
- Natural population growth
- Net migration rate
- Ageing/ Dependencies
- Reproduction potential
- Population in 'functional', 'strategic' age
- Total fertility rate
- Proportion of households with Internet access
- Proportion of households with broadband Internet access
- Population density
- Population by age
- Labour force
- Activity rates
- Unemployment rates
- Total employment
- Employment by qualification and profession
- Human capital
- Purchasing power indices

2.9.2 Scenarios

2.9.2.1 Scenario 1: Non-mastered socio-cultural integration

2.9.2.1.1 Scenario hypotheses

The main hypothesis of the scenario is one of increasing socio-cultural tensions and disruptions in Europe. Tensions between income groups, ethnic and religious groups are increasing and public policies are not successful in promoting social inclusion and integration as well as tolerance between the various cultural communities. Numerous elements of the scenario's hypotheses are derived from the extrapolation of trends.

2.9.2.1.2 Driving forces

The main driving forces leading to socio-cultural tensions and disruptions in Europe are:

- the increasing dualisation of European society resulting from higher remuneration of capital than of labour as well as from larger segments of the European labour force excluded from the labour market;
- the growing (mainly uncontrolled) immigration from outside the EU;
- limited public policies related to education, social inclusion, multiculturalist approaches, enhancement of regional identities and heritage.

2.9.2.1.3 Context

The EU has difficulties in reaching a higher economic growth rate in a context of challenging globalisation and devotes most of its energy and resources in promoting and liberalising the economy while neglecting the social impacts of economic transformations as well as the socio-cultural constraints resulting from progressing immigration and exclusion. Within the EU member countries, various types of socio-cultural policies are carried out by the different administrative levels, the efficiency of which varies widely from country to country. The lack of real coordination between the various levels and the pressure put on the lower levels result in the fact that socio-cultural tensions and conflicts cannot be mastered.

2.9.2.1.4 Scenario process

After 2005, a number of trends observed during the decade starting in 1995 intensified, mainly in metropolitan areas. Social segregation progressed in inner-city areas and in peripheral housing estates accompanied by urban deprivation, homelessness, insecurity and criminality. Urban areas with high accessibility through public transportation (railway stations, crossings of subway lines etc.) became also subject to increasing insecurity. Degradation expanded around these areas, a factor which contributed to accelerate segregation. People sufficiently well off chose more and more locations distant from the most socially problematic areas. A large number of them working in inner cities moved to the surrounding rural areas and became long-distance commuters. Those who remained within or at proximity of these deprived areas were low income often aged people.

Numerous well-off retired people decided to move from large cities towards distant, attractive and climate-favoured rural areas or small cities. This trend accelerated after 2010 when large cohorts of baby-boomers reached retirement age.

Social differentiation of lifestyles increased and was accompanied by a qualitative differentiation of the image and endowment of areas with services and amenities. The better offs have shown higher mobility (work and leisure commuting, long-distance trips by car, train and plane) and stronger consumption patterns, not only of goods, but also more and more of all kinds of services in various fields (health, culture, leisure etc.). The number of private schools and hospitals strongly developed in such areas. Because of increasing insecurity in public transportation, a large number of people have been using their cars, even for short-distance trips and mobility of the less well off diminished.

The failure of public policies in including the socially disabled population of working age into the labour market generated a growing scarcity of manpower in a context of accelerating population ageing. The employment rate decreased strongly after 2010. Caring services for the elderly could not be sufficiently developed. In a context of growing dependency rate, the less well off among the elderly became strongly disfavoured in terms of caring services.

A strong competition developed for attracting young qualified people. In order to successfully match this constraint, numerous footloose enterprises moved towards areas and regions with a good image in terms of attractiveness and safety.

Until the mid 2010s, problems were mainly concentrated in metropolitan areas. Nevertheless, a number of regions were confronted with problems at a larger scale. Regions along the Mediterranean coast (Spain, France, Italy and to a lesser extent Greece) had to face more and more the cumulative effects of growing immigration flows from outside Europe (Africa, Middle East) and flows of European migrants looking for favourable climatic and environmental conditions. The first 'gated communities' had emerged in these regions before the year 2000. Their number significantly increased over time.

In the new member countries, the growing polarisation of economic activities in metropolitan areas generated strong increase in housing price, so that numerous people excluded from the labour market or with insufficient income to cope with growing costs of living in large cities moved towards distant small and medium-sized towns and rural areas. Insecurity in large cities started increasing during the transition period. It continued growing because of larger numbers of marginalised people.

After 2015, xenophobia, cultural intolerance, racist attitudes, political radicalism had reached such levels that cohabitation between groups with different income levels, ethnic or religious origin became increasingly difficult. The problems of metropolitan areas propagated towards medium-sized and small towns. The number of gated communities boomed throughout Europe. Electronic control and security systems generalised and affected most segments of everyday life. Numerous re-education centres and jails were built to alleviate the feeling of insecurity. Tensions between cultural, ethnic and religious groups exacerbated in such a way that multiculturalist approaches became unrealistic and even counterproductive in the political sphere. Radicalisation of political attitudes worsened the situation. New forms of nationalism or 'comunitarism' developed.

By 2030, European society was strongly divided and segmented. The new regulation processes which had become necessary to maintain a certain level of stability has severely endangered democracy at various levels. Europe had moved towards a system of authoritarian governance which did not exclude a number of socially chaotic situations in numerous regions and cities.

2.9.2.1.5 Impacts

Macro-economic impacts

The failure in integrating the socially disabled groups of working age into the labour market has reduced the employment rate and has had strongly negative impacts on economic development. The shortage of qualified manpower has been a severe constraint with regard to the objectives of the Lisbon Strategy. A weaker economic situation had also indirect impacts on the provision of public services (health, culture, public transportation etc.), inhibiting growth in the service sector. Furthermore, the socio-cultural fragmentation of the European society and the rigidity of the new governance systems have been acting as significant obstacles to the exploitation of the 'territorial capital' of the various European regions, the success of which largely depends upon networking, exchange of information, cooperation, flexible attitudes, public-private partnerships etc.

Neglecting the enhancement of regional identities (culture, heritage etc.) has had detrimental effects on the economy also. The deterioration of urban areas, comprising the related infrastructure and facilities, has generated significant costs with long-term impacts.

Regional, territorial and environmental impacts

Territorial impacts of socio-cultural disruptions in Europe are stronger at the meso and micro levels than at the macro level. This does not exclude that the intensity of tensions and chaotic situations in a number of regions and cities may have large-scale impacts, for instance on the intensity of transnational migration flows within the EU.

Socio-cultural tensions and disruptions are favouring the move of people out of large cities and urban regions towards more 'socially quiet' areas (small and medium-sized towns, rural areas). This has been particularly obvious for retired people which are no more bound to their workplace. Other segments of the population have however also been concerned. An increasing number of active people have chosen to commute over long distances or to turn towards home-working. Pressure on attractive areas has been increasing because new forms of Greenfield settlements with more secure character could be developed.

There have been significant negative environmental impacts from growing motor-car traffic, resulting from both substitution to increasingly insecure public transportation and stronger commuter flows. In cities, dereliction and multiple deprivation have significantly expanded.

2.9.2.1.6 Final image

By 2030, a number of components of the European territory have substantially changed. The territory is much more segmented and divided according to socio-cultural characteristics. Attractive rural areas have been invaded by various groups of people, in particular by retired ones and by an increasing number of home workers. Rural areas surrounding large cities have been affected by large flows of newcomers commuting to their workplace. All these groups have in common the search of a more secure and more friendly socio-cultural environment. A large number of gated communities have been developed and are scattered throughout the most valuable and attractive landscapes in tourist areas or at proximity of large and medium-sized cities.

The counterpart is the presence of large urban areas with multiple deprivation which have expanded because of the deterioration of the economic situation and of the departure of the most well offs, but also of medium-level income groups. Social segregation in urban areas is

extremely accentuated and is reflected in very different townscapes, some being slums, other being well protected high-standing estates. Areas in between are unstable.

The environment has deteriorated, both in urban areas where dereliction has progressed and in attractive rural areas where settlements and transport infrastructure have strongly developed. Suburbanisation has significantly expanded at the expense of valuable natural areas near cities. Air pollution has increased as a result from more intensive use of motor-cars.

At a wider level, a number of regions with insufficient economic development resulting from low attractiveness, neglected territorial potential and regional identities (often offset by general socio-cultural tensions), are laying behind. Numerous of them could not catch up; so that the European situation in 2030 is one of increased regional disparities, when compared with that prevailing in 2005.

2.9.2.1.7 *Main issues arising from the scenario*

The scenario highlights the fact that Europe has come into a stage of its history where socio-cultural factors are gaining increasing importance and may have a leading and strategic role in future. Neglecting this dimension in the context of European integration is likely to generate significant socio-cultural disruptions which may be seriously detrimental to economic development. The potential territorial impacts of socio-cultural tensions and disruptions are numerous. Not only urban areas are affected, but also the surroundings of cities, attractive rural areas and, as a counterpart, less attractive regions.

2.9.2.2 *Scenario 2: Towards a sustainable multicultural and socially cohesive Europe*

2.9.2.2.1 *Scenario hypotheses*

The scenario is a policy scenario. It assumes that new public policies are defined and implemented at the various levels which aim at integrating as many people as possible into the labour market through education policies, at facilitating social cohesion through dialogue and tolerance between the various ethnic and religious communities, at promoting regional identities as factors of integration and development. It also assumes that the EU immigration policy will be more targeted and orientated towards attracting people with a sufficient level of qualification.

2.9.2.2.2 *Driving forces*

The main driving forces leading to the adoption of public policies as described above are:

- the increasing social tensions, troubles and criminality in a large number of European metropolitan areas related to the growing importance of marginal groups excluded from the labour market and from the mainstream society;
- the growing poverty and exclusion in the European society;
- the ageing of European society and the need to replace retiring people by a sufficient number of qualified people;

- the recognition of socio-cultural factors as essential for economic development and for the achievement of the Lisbon Strategy.

2.9.2.2.3 Context

The context which has made the emergence of new public policies in the field of socio-cultural integration possible after 2005 has been the growing awareness that the achievement of the Lisbon-Göteborg Strategy was not possible in a climate of growing social tensions and disruptions and of cultural intolerance. The challenge generated by population ageing and the related scarcity of qualified manpower was an additional argument to promote the integration of people excluded from the labour market and, more generally from the society. It was also recognised that the growing cultural heterogeneity in Europe resulting from immigration but also from the successive EU enlargements called for a positive multiculturalist approach.

2.9.2.2.4 Scenario process

Substantial changes in public policies in the years following 2005 resulted from the convergence of two main factors: the awareness that the increasing number of people excluded from the labour market was economically counterproductive and the growing exasperation of urban dwellers about increasing insecurity and criminality in cities. The resulting climate of xenophobia and political radicalisation in numerous European cities was considered as serious enough by the various national governments to envisage the strengthening of coordination of policies at EU level, together with the involvement of a higher amount of EU resources in activities he most likely to contribute to the solution of problems.

In the context of the open method of coordination, member states decided to give an absolute priority to education and training of those groups already marginalised or threatened to become marginalised, with a specific attention to young people (early school leavers with or without diplomas). An efficient system was set up which benefited from significant EU support and combined fellowships (conditioned to assiduity and success in learning), actions of awareness raising and civic education, repression of criminality always combined with education and/or vocational training measures, coaching of socially disabled people, in particular when entering into the labour market. Not only social workers and educators and teachers, but more and more retired people with a successful career in enterprises were involved in training and coaching actions of young and/or marginal people.

A great attention was paid to the maintenance of urban areas affected or threatened by multiple deprivation, addressing not only the physical aspect of the urban fabric, but also the endowment with services and facilities favouring social inclusion. Efforts were developed to support specific ethnic and religious cultures in a climate of tolerance.

A particular consideration was given to the promotion of regional identities in less prosperous regions in order to both promote the indigenous potential and regional capital of these areas and to counteract trends of xenophobia and racist/nationalist attitudes.

The governance of the strategy actively involved all levels from the municipal to the European ones. At EU level, in addition to the mobilisation of significant resources from the EU budget, transnational actions in the field of socio-cultural integration and promotion were developed and supported. The various EU policies in the field of culture, education and training, regional and local development etc. were more integrated and better targeted in

order to better correspond to the strategies developed at regional and local level. Networking of local experiences was developed. It contributed to strengthening the multiculturalist approach. The EU immigration policy changed substantially. While illegal immigration was more severely controlled, the (temporary or definitive) immigration of qualified people was favoured.

By 2015, the first significant results of the strategy could be observed. Criminality and insecurity in cities had generally decreased, a fact which contributed to weaken attitudes of xenophobia and racism/nationalism. Social stability could be improved in numerous European cities.

The promotion of regional identities in relation to the mobilisation of territorial potentials made the development of economic activities possible, also in disfavoured regions. The availability of qualified and motivated manpower enabled innovation and networking activities in line with the objectives of the Lisbon Strategy.

It was however after 2015 that the strategy proved to be the most useful. After the retirement of large numbers of people from the labour market, demand of qualified people increased significantly. Education, training and social inclusion activities which had been developed during the period 2005-2015 proved to be extremely fruitful. Not only enterprises benefited from them, but also the whole caring sector for the elderly.

In such a context, the reluctance of numerous Europeans with regard to further EU enlargements had been alleviated and negotiations with a number of new candidate countries could start, so that by 2030 the EU borders coincided more or less with those of the 'wider Europe'.

2.9.2.2.5 Impacts

Macro-economic impacts

The strategy is based on the involvement of larger amounts of resources in the sectors of education, training, social inclusion, culture etc. As far as resources from the EU budget are concerned, savings in other sectors had to be made and more integrated and targeted approaches had to be developed. In the various member states, similar re-organisation of resource allocation had also to be carried out. Main constraints existed in the first years of implementation of the strategy. From 2010 onwards, return on investments was already significant in terms of savings of public resources for the unemployed and the socially disabled, the number of which had seriously diminished. The increase of the employment rate generated not only higher tax revenue for public budgets, but also stronger purchase power and more economic activities. The strategy contributed significantly to alleviate the shortage of qualified manpower which resulted from the emergence of large number of retiring people.

Regional, territorial and environmental impacts

At macro-level, the strategy contributed to reduce the volume of transnational and interregional migration flows which are often generated by economic as well as social factors. The fact that the strategy was strongly coordinated and promoted at EU level ensured high efficiency in the various European countries and regions, so that the potential increase of regional disparities was alleviated. This favoured slower concentration of people and activities in the Pentagon.

At meso-scale, within the various member countries, less people, in particular the retired ones, were inclined to leave the cities and to settle in distant rural areas. The spatial segregation of generations was alleviated.

Most positive impacts were to be observed at the regional/local level, especially in and around metropolitan areas as well as in less important cities. The expansion of deprived areas could be limited and the rehabilitation of a number of these areas was successful. The development of gated communities was contained and concerned only a limited number of sites attracting 'international clients' (tourist, retired people) in high-standing, highly attractive areas.

A relatively peaceful urban climate enabled to maintain compact cities serviced by public transportation and less dependent upon motor-cars. Pressure on surrounding open spaces and rural areas was limited as the progress of suburbanisation could be contained.

2.9.2.2.6 *Final image*

Through the implementation of the strategy, the European territory will have maintained by 2030 numerous characteristics it had in 2005. A number of changes will however have been caused by the structural evolution of the economy and of demography (provided no other perturbing events will have happened in between). Attractive rural areas are more densely populated than they were in 2005, especially in regions of southern Europe, due to population moves of retired people and of people in situation of working far away from cities. Cities are more lively with a clear cosmopolitan touch reflecting the success of integration policies. Social and cultural segregation has not completely disappeared, but is less visible. People with non-European origin have to a significant extent reached middle-class and even upper-class level, so that the areas where they are living have the character of specific cultural communities and do not, for the largest part, reflect poverty and deprivation.

A number of disfavoured regions have benefited from the promotion of cultural identities and developed their territorial potential in such a way that their competitiveness and resistance capacity in the context of globalisation have increased. They are no more marginalised territories.

2.9.2.2.7 *Main issues arising from the scenario*

The scenario highlights not only the benefits which may result from renewed and sustained socio-cultural policies in terms of economic development and social cohesion, but also the need to involve more the European level in such policies, both as a level of coordination between the various EU countries and as a provider of financial resources. With such an approach, undesired spatial evolutions are likely to be avoided and restrained.

ESPON Project 3.2
*Spatial Scenarios and Orientations
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 Policy*

Second Interim Report
 March 2005

Part 3

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Part 3

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Glossary

| | |
|-------------------|---|
| AMECO Database | Annual macro-economic Database |
| AON (Assignment) | All-Or-Nothing (Assignment) |
| CAP | Common Agricultural Policy |
| CEECs | Central and Eastern European Countries |
| CORINE | Co-ordination on Information of the Environment |
| EAGGF | European Agricultural Guidance and Guarantee Fund |
| EEA | European Environment Agency |
| ESDP | European Spatial Development Perspective |
| ETCI | European Territorial Cohesion Index |
| FUA | Functional Urban Area |
| GU | Geographical Unit |
| HDI | Human Development index |
| INTERREG | Community initiative concerning border development, cross-border cooperation and selected energy networks |
| ISPA | Instrument for Structural Policies for Pre-Accession |
| JRC | Joint Research Centre |
| K+C tool | Knowledge and Communication tool |
| KTEN | Know trans-European Networks |
| MASST (model) | Macroeconomic, Sectoral, Social and Territorial (model) |
| MAUP | Modifiable Area Unit Problem |
| NEC Directive | Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants |
| NIS | New Independent States |
| NUTS | Nomenclature of territorial units for statistics |
| NWMA | North Western Metropolitan Area |
| PHARE | The Phare programme is one of the three pre-accession instruments financed by the European Union to assist the applicant countries of Central and Eastern Europe in their preparations for joining the European Union |
| RDP | Rural Development Policy |
| SAPARD | Special Accession Programme for Agriculture and Rural Development |
| SPESP | Study Programme on European Spatial Planning |
| STU | Spatio-Temporal Unit |
| SWOT | Strengths Weaknesses Opportunities and Threats |
| TENs | Trans European Networks |
| UTS | Unions Territorial Strategies |

Part 3: Tools, Communication Strategy and Scientific Coordination

Introduction

Project 3.2 has as its main objective the elaboration of scenarios. These scenarios are, by definition, qualitative, although they are based on quantitative information. In order to enhance the quantitative side and to support the exploratory character of the scenarios, the team is developing several tools: one regional econometric model, one transport meta-modelling system (which can be extended to other themes), measures of territorial diversity and a long-term database. All of these tools are presented in the first chapter of this part.

Scenarios are a profoundly pedagogical exercise, which focus the attention on several issues and the driving forces underlying these issues. It does not suffice, therefore, to elaborate scenarios and to discuss them in the limited ESPON circles. As these scenarios offer provocative food for thought to decision-makers and researchers at different scales, they should be disseminated in a way allowing evaluation and debate, but also awareness raising. In this manner they should contribute to the ongoing policy debates around the issues of territorial cohesion and development.

A parallel task the project has to address is the scientific coordination of the whole ESPON programme, including management of enhancement of the ESPON scientific platform. This task was taken over from project 3.1 in October 2004 with the Nijmegen Seminar. Since then project 3.2 has continued the work on the ESPON Database, has published the Nijmegen Guidance Paper and prepared and lead the February Lead Partner seminar.

This part ends with a general outlook onto the project's tasks until the third interim report.

Chapter 3 Tools for the identification of threats and potentials for a more balanced territorial development such as indicator lists, databases, mapping methods covering all themes in a comprehensive and integrated way

Introduction

This part contains the different tools and methodologies developed in parallel to the scenario building process. These tools were deemed necessary in order to reinforce the scenarios through more quantitative analyses and projections. This includes

- two models: MASST (regional macro-economic) and KTEN (transport meta-model);
- experiments for the elaboration of an indicator: European Territorial Cohesion Index;
- the elaboration of a long-term database.

For some tools the connection to the scenarios is quite obvious. The two models (MASST and KTEN) will support the different scenarios, especially future integrated scenarios with quantitative projections based on the hypotheses explored in the scenarios.

The experiments around the concept of a European Territorial Cohesion Index (ETCI) show that it is currently impossible to construct such an index due to a severe lack of data, notably social and environmental. The aim is, therefore, to explore possible solutions to this lack of data in order to develop some form of method for evaluating the impacts of different scenarios on territorial cohesion. This remains, however, very experimental at this stage.

The long-term database is now ready to enter a first production-level test phase and in the ongoing debate on how to ensure sustainability of the ESPON database, this will be a very important step. At the same time, we have begun the collection of long-term data in order to allow some basic quantitative analyses. However, resource constraints will not allow us to spend much time on new data collection.

Links between tools and ESPON scientific platform

Some of the tools developed here should be seen in the more general context of the ESPON scientific platform (see relevant chapter). Especially the meta-modelling system currently developed for the KTEN model, but with possibilities of extension, the research concerning the ETCI and the long-term database are all going to contribute to the collection of tools and methods available to ESPON as a whole.

3.1 Macroeconomic, Sectoral, Social and Territorial Model (MASST)

3.1.1 Introduction

In this second interim report, the Politecnico of Milan aims at presenting the logic and the structure of the quantitative model (MASST) for scenario sketches. Before entering the scenario model, a brief introduction to regional econometric models is provided. The model specification and data acquisition will follow; the model specification deals with the conceptual and analytical structure of the model. The data acquisition section reports the data so far available to the group and the important missing indicators.

The report ends with three organisational sections; one section underlines the characteristics of the scenarios based on MASST and their possible interaction with the qualitative scenarios. The second section briefly reports the linkages with other ESPON projects and finally the steps forward that will be made in the next six months are presented in the concluding section.

3.1.2 Introduction to Regional Econometric Models

Regional econometric models deal with the description, analysis, forecasting and policy appraisal of economic development within a set of localities or regions. Such models concern not only internal structures and relationships, but also interregional relationships.

Econometric models are applied to a variety of issues: a wide class of models are concerned with the dynamics of income, demand, supply and investment determinants; others are focused on more slowly changing structural properties related to the layout of facilities and infrastructures; yet, other models concern the extremely rapid adjustments in the flows of people, commodities and resources between regions (journey-to-work, journey-to-shop, migration, etc.). Our interest in this project concerns the application of econometric models to the estimate (and forecasts) of regional growth.

The distinguishing feature of econometric models with respect to other operational models is not an underlying theory (as in the case of, for example, input-output models or economic base models), but the way a model is specified (e.g. based on an underlying theoretical framework) and the way coefficients are estimated (e.g. based on a method of estimation)¹.

In this respect econometric models represent a higher degree of flexibility than models and technics linked to one single theoretical approach, and this element has been one of the determinants of the success of econometric models since the sixties, when for the first time they have been applied to the interpretation of economic growth.

¹ See, on this aspect, Nijkamp P., Rietveld P. and Snickars F. (1986), 'Regional and Multiregional Economic Models: a Survey', in Nijkamp P. (ed.), *Handbook of Regional and Urban Economics*, North Holland, Amsterdam, vol. 1, pp. 257-294.

Moreover, there are other reasons for the creation and use of econometric models². First of all, they are able to provide a quantitative interpretation of the development process and make explicit the most important linkages which exist both within the local economy and between the local economy and the national and international economic systems. Secondly, they can support decision-making processes of political economy, since they allow to explain the assumptions on which economic policies rest and are able to quantify the effects of such policies.

An econometric model is structured around four main stages:

- 1° stage: specification of the model;
- 2° stage: data acquisition;
- 3° stage: parameter estimation and model calibration;
- 4° stage: forecasting and policy control.

These general stages are common to each econometric model, whatever the territorial level of analysis (national or regional) at which it is applied or the aim of the modelling exercise (e.g. dynamics of income, flows of travellers, etc.) for which it is used.

In the stage of the *model specification* the interdependence and causality relationships among multiple groups of variables are identified. At this stage, the structure of the econometric models chosen defines the causality relationships and interdependences among variables which reflect the aim of the modelling exercise and the underlying theoretical base on which models rest.

The second stage of an econometric model deals with *data acquisition*. The existence of macroeconomic data at the regional level has allowed, in the late sixties and beginning of the seventies, to apply the national econometric models (specified on the basis of the National Account System) to regional context, giving birth to the first regional econometric models. In these models, the relationships among variables characterising the regional economic system are described, as well as the relationships of these variables with other regional systems and with the national system³.

The third stage deals with the *parameter estimation* and the model calibration. In the last years, econometric technics have been studied with the aim to correct parameter error estimations, and to reduce model mis-specification. For example, tests have been formulated to correct spatial autocorrelations.

The fourth stage represents the *forecasting methodology*. Based on specific hypotheses on future trends of variables determining regional growth, an econometric model is able to generate a new value for regional growth; the model is also able to provide alternative future development patterns when alternative hypotheses on independent variables are formulated.

Econometric models present a number of caveats and limits that have to be taken into consideration once they are used. One limit relates to possible mis-specifications of models, which leads to inconsistencies in the results obtained; in order to avoid such a risk, specific tests will be used in order to avoid these mistakes. Another limit is related to the fact that the results obtained heavily depend on the causality relationship which is expressed in the

² See, on this aspect, Cappellin R. (1975), 'La struttura dei modelli econometrici regionali', *Giornale degli Economisti*, luglio-agosto, pp.423-452.

³ See on this aspect, Cappellin R. (1975), 'La struttura dei modelli econometrici regionali', *Giornale degli Economisti*, luglio-agosto, pp.423-452 and Cappellin R. (1976), 'Un modello econometrico dell'economia lombarda', *Giornale degli Economisti*, giugno, pp. 263-290.

model, i.e. on the assumptions made by the modeller; good reasons for a specific model specifications have to be provided, since they influence the results obtained.

In the next section, we present the first two stages for the MASST model, i.e. the model specification and the data acquisition. The other two stages will be developed in the next reports.

3.1.3 Specification of the MASST model

3.1.3.1 Conceptual Underpinnings and Outcome of the MASST model

The MASST model is an econometric model with the aim to measure the determinants of regional development and regional imbalances; once the causality relationships are estimated, the model estimates future quantitative changes in regional income and regional inequality.

In fact, the outcome of the MASST model will be different territorial settings of the new Europe based on conditional quali-quantitative hypotheses on future trends of macroeconomic and institutional driving forces; each future territorial setting will define winners and losers, and will identify new levels of regional disparities (Fig. below).

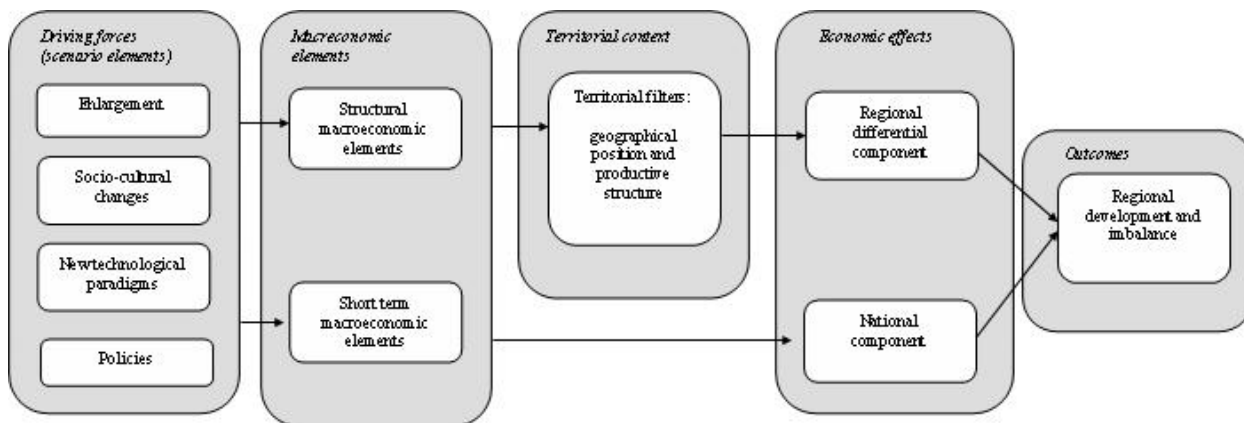


Figure 43 Conceptual Underpinnings of the MASST model

The logic behind the model is an economic logic. Regional growth can in fact be divided into two components (Fig. 43):

- a *national component*, since a national economy influences the dynamics of its regions; positive macroeconomic elements supporting growth at the national level - like low interest rates stimulating investments or low exchange rates creating national competitiveness on international markets - support the development of regional economies;
- a *regional component* (defined as the *differential shift*). National growth is in fact the average growth of all regional economies of a Country. Each regional economic growth differs from the average according to the degree of competitiveness of the local economy. Local competitiveness has traditionally been analysed as dependent

on the quality and quantity of local resources such as capital and labour. More recently, much attention has been given to the presence of soft elements, like the efficiency of local institutions, the degree of local synergy among local actors and the cooperation with external bodies; these soft elements are interpreted as the main determinants of local competitiveness, in terms of both productivity and innovation activity performance.

The MASST model identifies regional growth as the sum of the two components:

$$\Delta Y_r = \Delta Y_n + s_r \quad (1)$$

where:

ΔY_r = rate of growth of regional income

ΔY_n = rate of growth of national income

s_r = regional differential shift

As mentioned, both components are influenced by the dynamics of macroeconomic elements; the impact macroeconomic elements have on the differential shift component very much depends on the way in which the local economy is able to grasp the opportunities offered. As mentioned before, this capability depends on the physical and soft resources present locally (on *endogenous* elements), as well as on the geographical position of a region (border region, central region etc., i.e. on *exogenous* elements). At the other end, the dynamics of macroeconomic elements depend on institutional, technological and socio-cultural driving forces (Fig. 43).

3.1.3.2 The National Component Sub-Model

Going into detail on the specification of the MASST model, the structure of the model identifies two sub-models, one related to the national component and the second to the regional component, sketched in the Figure below. In this sub-section, the specification of the national component sub-model will be presented.

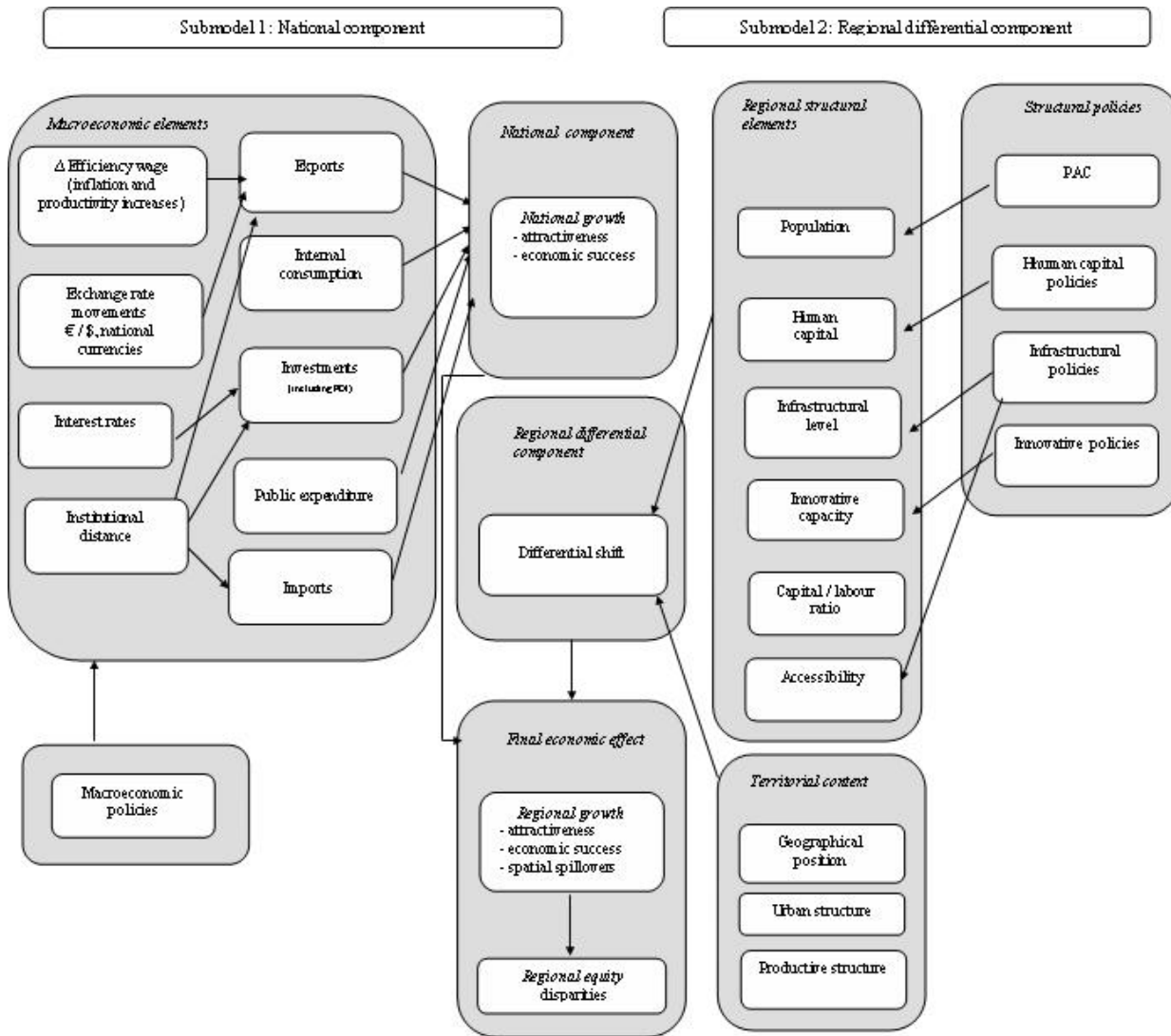


Figure 44 MASST Model Specification

The national component analyzes national growth as dependent on changes in the aggregate demand components:

$$\Delta Y_{nt} = \alpha_0 + \alpha_1 \Delta C_{nt} + \alpha_2 \Delta I_{nt} + \alpha_3 \Delta G_{nt} + \alpha_4 \Delta X_{nt} + \alpha_5 \Delta M_{nt} \quad (2)$$

where:

- α = parameters to be estimated
- ΔC = rate of growth in consumption
- ΔI = rate of growth in investments (including FDI)
- ΔG = rate of growth in public expenditure
- ΔX = rate of growth in exports
- ΔM = rate of growth in imports

The rate of growth of the public expenditure is an exogenous variable. On the contrary, the other components of the aggregate demand are endogenously obtained.

Consumption growth depends on income growth, following a Keynesian economic approach:

$$\Delta C_{nt} = \alpha_{10} + \alpha_{11}\Delta Y_{nt-1} \quad (3)$$

Investment growth, in turn, is related to changes in interest rates and to the 'institutional distance' existing between two Countries. It is in fact empirically proven that national differences in culture and institutional quality affect the level of attractiveness of a Country, and therefore both trade and FDI:

$$\Delta I_{nt} = \alpha_{20} + \alpha_{21}\Delta i_{nt-1} + \alpha_{22}\Delta Y_{nt-1} + \alpha_{23}ID_{nt-1} \quad (4)$$

where:

I = investment

i = interest rate

Y = national income

ID = institutional distance

n = a Country

t = time

Institutional distance among Countries is calculated on the basis of the database on institutional quality produced by Kauffmann. Kauffmann's database presents estimates of six dimensions of governance covering 199 countries (including the 27+2 European Countries) and territories for four time periods: 1996, 1998, 2000, and 2002. These indicators are based on several hundred individual variables measuring perceptions of governance, drawn from 25 separate data sources constructed by 18 different organizations. These individual measures of governance have been assigned to categories capturing key dimensions of governance, and use an unobserved components model to construct six aggregate governance indicators in each of the four periods. Categories are:

- *political stability*. It includes the likelihood that the government will be overthrown by unconstitutional interference;
- *voice and accountability*. It reflects the political process and includes the independence of media;
- *government effectiveness*. It measures the quality of the public service provision, the bureaucracy, the competence of civil servants;
- *regulatory quality*. It reflects the quality of the implemented policies, like the degree of over regulation of business development and the incidence of market-unfriendly policies;
- *control of corruption*. It reflects the degree to which public power is exercised for private gain;
- *rule of law*. It measures the degree to which citizens have confidence in the law and abide by the rules of society. It concentrates on the quality of the legal system and the enforceability of contracts.

The growth in export of a national economy depends on the demand expressed by other Countries, and it is therefore exogenous to the national economy analysed:

$$\Delta X_{nt} = \textit{exogenous} \quad (5)$$

For what concerns the last element, import growth, the rate of growth of the national income (Y), the exchange rate (e) and the institutional distance (ID) are interpreted as the main explanatory elements for import dynamics:

$$\Delta M_t = \alpha_{40} + \alpha_{41}e_{nt} + \alpha_{42}\Delta Y_{nt-1} + \alpha_{43}ID_{nt-1} \quad (6)$$

3.1.3.3 The Regional Differential Component Sub-Model

The regional differential sub-model is intended to provide an estimate of the competitiveness of the regional economy, and it therefore focuses the attention on long term structural elements stemming both from the geographical location of a region and from its productive and institutional structure.

The model specification reflects this intent by approaching the regional differential growth () through a quasi-production function approach; in this approach, the regional differential shift depends on local structural elements, like regional innovation potential, potential accessibility, material resources (human capital, physical capital, labour), population and economic resources:

$$s_{rt} = f(\text{regional innovation potential; economic resources; population; potential accessibility; territorial structural characteristics}) \quad (7)$$

The following indicators will be built:

1. for *regional innovation potential*:
 - research and development expenses (R&D)
 - human capital (H)
2. for *economic resources*:
 - capital (K)
 - labour (L)
 - capital/labour ratio (K/L)
3. for *territorial structural characteristics*, dummies will be applied:
 - dummy for metropolitan areas
 - dummy for capital regions in Eastern Countries
 - dummy for border regions between Eastern and Western Countries
 - dummy for settlement structure

Data for polycentric and for accessibility areas, available in the ESPON database at NUTS3 level, are impossible to be applied at NUTS2; the original data are missing and the ESPON categorical data at NUTS3 are impossible to be summed at NUTS2 data.

4. for *potential accessibility*:
 - infrastructure endowment (IE)
 - physical accessibility (Acc)
 - territorial spillover (SP)
 - regional economic potential (EP)
 - regional economic integration potential (LEIP)

For the measurement of territorial spillovers and regional economic integration potential, two specific indicators will be built, namely:

$$SP_{rt} = \sum_{j=1}^n \frac{1}{n} \frac{\Delta Y_{jt}}{d_{rjt}} \quad (8)$$

$$EP_{rt} = \sum_{j=1}^n \frac{Y_{jt} - Y_{rt}}{d_{rj}} \quad (9)$$

and

$$LEIP_{rt} = \sum_{j=1}^n \frac{1}{n} \frac{Y_{jt} - Y_{rt}}{d_{rj}^m} \quad (10)$$

where:

SP = territorial spillover

EP = economic potential

$LEIP$ = economic integration potential

ΔY_t = per capita income growth

Y_t = per capita income

j = all neighbouring regions of region r

d_{rj} = physical distance between region r and j

n = number of neighbour regions

m = weight given to physical distance between regions, measuring higher spatial friction when economic barriers are present (tariff, transport costs).

According to our *spillover indicator*, the higher the increase in income of neighbouring regions, the greater the positive effect on local income growth. In turn, the *indicator of economic potential*, defined as the accessibility to total income at any location allowing for distance, measures the differences in income between the local economy and all other existing regions weighted by distance. The higher the difference in income with nearby regions, the higher the economic potential of a region. Last, but not least, the *local economic integration potential indicator* measures the accessibility to a neighbouring income from a region weighted for the physical distance which takes into consideration the presence of different barriers; when the barrier is a national barrier between EU15 countries, m equals 2. If the barrier is a national barrier between an EU15 member Country and an Eastern country, m equals 3 or 2 respectively before and after the decision of accession Countries of joining the EU.

Thanks to these indicators, MASST is also a model able to measure territorial and economic linkages among nations and territories.

5. for *population*:

number of inhabitants (*pop*)

While all other variables will be exogenously treated, population will be endogenously obtained by estimating the following relation:

$$\Delta P_{t-1} = \lambda_0 + \lambda_1 fr_{t-2} + \lambda_2 mr_{t-2} + \lambda_3 im_{t-2} \quad (11)$$

where:

fr = fertility rate - exogenous

mr = mortality rate - exogenous

im = interregional migration

In its turn, outmigration is the result of local unemployment level and wage differentials between the local wage and the European average wage:

$$im_{rt-2} = \eta_0 + \eta_1 u_{rt-3} + \eta_2 (w_{et-3} - w_{rt-3}) \quad (12)$$

where:

u = unemployment

w_e = European average wage

w_r = regional average wage

The greater the difference in local wages with respect to national ones, and the greater the unemployment level, the higher the outmigration from the region will be.

3.1.3.4 Driving forces in MASST

As mentioned before, and sketched in Fig. 43 and 44, the dynamics of macroeconomic elements, at both the national and local level, will be the result of driving forces of change of different nature. The MASST model is able to take into account the following driving forces:

- macroeconomic driving forces;
- technological driving forces;
- institutional driving forces;
- demographic driving forces;
- socio-cultural driving forces.

The *macroeconomic driving forces* that MASST model can take into account are the following:

- trend in the euro/\$ exchange rate;
- trend in fiscal morality (trend in public debts, revision of the Maastricht parameters);
- trend in interest rates;
- trend in inflation rate;
- geo-political orientation of FDI;

- rebalancing of external accounts of big emerging countries (China, etc.);
- increase in energy price.

Regarding the *technological driving forces*, MASST can take account of:

- infrastructure development;
- R&D development;
- new technological paradigm.

Institutional driving forces that MASST can analyse are:

- enlargement;
- restructuring of Community Agricultural Policy;
- reorientation and size of structural funds;
- attitude towards East-West and North-South migration.

The *demographic driving forces* that can influence the MASST scenarios are:

- trend in fertility rate;
- trend in population ageing.

Last but not least, the *socio-cultural driving forces* are envisaged in:

- trend in saving ratio.

The way the model will integrate these variables will be explained once the statistical significance has been clarified.

3.1.4 Data acquisition

The MASST model requires a large amount of data at a disaggregated territorial level and in time series. A lot of work has already been achieved in this respect, using different sources, but still some gaps are present and data are missing.

The first important results after a careful analysis of the available data in Eurostat, in ESPON and in the EOCED statistics are the following:

- the most disaggregated territorial level we can achieve without incurring in unmanageable gaps of data is NUTS2 level;
- for the same reason, the first year of analysis we can think of taking into account is 1995. Before that year, NUTS2 data for the Eastern Countries are not available.

Starting from 1995 and working with a NUTS2 disaggregation level, the available data (with some manageable gaps) for EU27+2 are presented in Table 27.

| Indicator | Geographical disaggregation | Source |
|---|------------------------------------|--------------------|
| Inflation rate | Nuts 0 | Regio |
| Wages | Nuts 0 | Regio |
| Productivity | Nuts 0 | Regio |
| Consumption | Nuts 0 | Regio |
| Investments | Nuts 0 | Regio |
| Short term interest rates | Nuts 0 | Regio |
| Long term interest rates | Nuts 0 | Regio |
| Inflows and outflows of FDI | Nuts0 | Regio |
| Stock of in and out FDI | Nuts0 | Regio |
| Public expenditure | Nuts0 | Regio |
| Exchange rate national currency / \$ | Nuts0 | Regio |
| Productivity by worked hour | Nuts0 | Regio |
| Productivity by worked hour per week by employees | Nuts0 | Regio |
| Productivity by worked hour per week by full time workers | Nuts0 | Regio |
| Import | Nuts0 | Regio |
| Export | Nuts0 | Regio |
| Political stability | Nuts0 | Kauffmann |
| Regulatory quality | Nuts0 | Kauffmann |
| Control of corruption | Nuts0 | Kauffmann |
| Rule of law | Nuts0 | Kauffmann |
| Settlement structure | Nuts2 | ESPO 3.1 |
| Objective 1 or 2 regions | Nuts2 | EU |
| Regions within the Pentagon | Nuts2 | ESPO 2.1.1 and 3.1 |
| Border regions | Nuts2 | ESPO 2.1.1 |
| Infrastructure endowment | Nuts2 | ESPO 2.1.1 |
| Physical accessibility | Nuts2 | ESPO 2.1.1 |
| Employment | Nuts2 | Regio |
| Value added at factor costs | Nuts2 | Regio |
| Value added at market prices | Nuts2 | Regio |
| Gross domestic product at market prices | Nuts2 | Regio |
| Gross domestic product at purchasing power standard | Nuts2 | Regio |
| Population | Nuts2 | Regio |
| Tertiary level students | Nuts2 | Regio |
| Compensation of employees | Nuts2 | Regio |

Table 27 Available data in time series since 1995

The important missing indicators are:

- a more precise indicator of human capital (and not the simple degree of study);
- an indicator of social capital;
- an indicator of local and external synergies;
- an indicator of physical capital;
- an indicator of capital by sector;
- an indicator of employment by sector.

3.1.5 Characteristics of the MASST scenarios: linkages with the qualitative scenarios and other quantitative activity within the TPG

As already mentioned, the results of the MASST model will be territorial scenarios (at NUTS2 level).

Each scenario will be based on general driving forces; the MASST model is in fact unable to provide results for very specific driving forces (like the advent of a certain technology rather than another). These differences in future scenarios are typical of qualitative scenarios, able to capture specific changes.

Single driving force impact forecasts will be produced on maps as a first step towards more integrated scenarios. In this respect, some qualitative thematic scenarios, when based on opposite hypotheses on the driving forces, can be mapped.

Despite this support to qualitative thematic scenarios, the most interesting and crucial outcome of the MASST scenarios *will not be* thematic scenarios, but rather cross-thematic scenarios, based on a combination of different hypotheses on the driving forces.

Each scenario will be the result of a cause-effect chain, which will influence variables of different nature (demographic, technological, macroeconomic). Each scenario will also be the result of territorial and economic linkages that exist among nations and regions; the former stem from the import-export relationship emphasised in equation 2, while the latter are measured via 'territorial proximity effects', - i.e. the economic advantages in terms of economic potentials provided to a region by its location in a dynamic and increasingly growing area – and by economic integration potential effects.

Therefore, in order to have clearly defined alternative scenarios, a limited number of scenarios will be produced.

Once the future levels of per capita income are forecasted, winners and losers in the new Europe will be identified and disparities quantified. In this respect, in the next month the group in charge of MASST will work in close connection with UMS RIATE to see whether the MASST model can be linked to the task of estimating measures of territorial cohesion.

Beside MASST the research group will provide for all 27+2 Countries and for groups of regions (i.e. Ob.1; Ob. 2) for the period 1995-2002:

- quantitative charts of models of development, built on the basis of relative productivity and relative employment growth. According to the relative position of each region or country on the chart, different models of development are highlighted: e.g. a development based on both higher relative employment and productivity rates (a virtuous development), or a development based on higher relative productivity rates but lower employment growth (a take-off development, based on the elimination of non-efficient employment);
- quantitative charts on efficiency and equity models, built on the basis of an efficiency and an equity indicator; the relative position of regions and countries highlights whether they have grown achieving equity purposes, efficiency purposes, both or none of them. This chart is a quantitative framework on past patterns of growth of the qualitative economic policy scenarios;

- quantitative charts on winners and losers; this chart identifies whether growing (winners) or declining (losers) areas are the poorest or the richest areas.

This information will also be provided to the upcoming project 3.4.2.

3.1.6 Linkages with other ESPON projects

During these months the group in charge of the quantitative scenarios had deep and continuous contacts with the lead partner of 3.3 (University of Rome – Tor Vergata). At present, the exchanges have been mainly informative. Although project 3.3 has just started, at present no overlapping outcomes of the two projects are envisaged. On the contrary, overlapping activities in data collection exist, and coordination activity has been put in place.

In future cooperation will also be sought with projects 3.4.1. and 3.4.2.

3.1.7 Future steps

Three main lines of research will be developed for TIR (due in January 2006):

- the database will be finalised;
- the first parameter estimations of the model will be run (3^o stage of an econometric model);
- the first hypotheses on the driving forces will be presented and therefore the quantitative scenarios that will be provided (in terms of number and qualitative characteristics) will be sketched (first step of the 4^o stage of an econometric model).

3.2 Know Trans-European Networks Model (KTEN)

3.2.1 Forecast models on transport

Based on the results of existing forecast models in different strategic sectors (demography, economy, transport, energy, and CO2 emissions), an integrated metamodel has been developed, programmed into a spreadsheet or equivalent software tool. The main aim of this model is to help policy-analysts explore the sensitivity of main trends to some key variables, and to verify the consistency of scenarios. The integrated set of metamodels can also contribute to the analysis of policy impacts, to the extent that current advanced models have been able to forecast them.

Despite the obvious difficulties involved in developing a set of integrated sectoral metamodels, the effort is worthwhile since they can provide a useful quantitative reference to frame more qualitative scenario narratives. More than black boxes which are only really used by their developers, metamodels will be developed on spreadsheets (enhanced with Visual Basic programming if needed) and enjoy user-friendly interfaces.

The goal of KTEN's further development and application within ESPON3.2 is to provide an interactive metamodel framework to include most of the strategic aspects missing in more specialised transport forecast models. The objective of KTEN improvements (now a metamodel focused on passenger interregional trips) has been double: to extend the metamodel to cover freight, and to enrich the scenario-building capabilities to cover significant variables which include and explicit spatial dimension, consistent with other ESPON3.2 developments. It is important to note that the KTEN model does not take into account intra-regional traffic. The latter is often the source of congestion, especially in densely populated areas. However, current models and databases do not offer a sufficient resolution for evaluating such traffic.

Early stages of the modelling process have consisted in gathering existing databases at European level, linked to ongoing database and modelling exercises led by DGTREN (ETIS-BASE). New available transport databases for passengers and freight have been evaluated, and data on passengers gathered (Eurostat, ETIS-Base, etc.) so as to support the KTEN improvement into a spatial-oriented strategic metamodel.

3.2.1.1 What's a metamodel? A metamodel as a knowledge-based tool to build scenarios

Executive knowledge-tools are user-friendly software tools interfacing advanced evaluation and forecast models. The paramount goal of knowledge tools is facilitating a deeper understanding of the impacts of key policy options in the growing complexity of European transport systems. In general, knowledge tools are based on the results obtained from running advanced models, using pre-calibrated statistical functions and default assumptions etc. Full transparency and interactivity are key requirements to make such tools a learning experience for end users to the difference of classical forecast models which are often too complex to understand for the non-expert.

Since the transport system is an increasingly complex system, intuitions and common sense are becoming more and more risky and advanced decision-making tools will increasingly be needed.

Usually, experts assess policies on a personal basis. Experts provide an intelligent intermediation between information produced by scientific methodologies (e.g. predictive and evaluation models) and specific policy questions. When feasible, experts provide meaningful policy indicators by using objective methods (e.g. Investment return rates by Cost-Benefit Analysis) to support more subjective advice.

A knowledge-tool is a computer-based policy-interface providing interactive access to advanced forecast and evaluation models. Knowledge-tools often may look like 'back cast models', in the sense that they provide the user the capability to pre-fix a set of goals and investigate alternative strategies to satisfy them.

Needless to say, any 'Knowledge Tool' requires a model behind. For advanced models, on-line computation of alternative actions is often not feasible. In these cases, a new interactive model has to be developed based on the pre-calculated results of the advanced one. The crucial element in the design of a knowledge-tool is not to oversimplify the model (leading towards inconsistent and misleading answers) but to interface it, or at least break it up into a number of interlinked and interactive policy-relevant modules.

Interactivity is indispensable to make learning possible. It is because of the experience of simulating the impacts of alternative decisions that the user may identify behavioural patterns in the modelled system; it is by using different interactive models to explore the same actions that the user may identify the limits and advantages of the modelling paradigms. At the end the paramount goal is to enable policy makers to integrate the scientific reasoning in the latest steps of the decision-making process.

3.2.1.2 KTEN passenger model

KTEN is a simplified passengers' traffic model developed to facilitate a strategic analysis of the trans-European Transport Networks on a wider pan-European and Mediterranean scale. KTEN is a sequential 4-steps model, with combined modal split and assignment on multimodal networks (1 complete run of KTEN takes 150 minutes; KTEN is 40 Mb large in total). KTEN uses STREAMS model results, WTO and EUROSTAT Air Traffic OD databases as benchmark and/or reference.

To calculate trip generation, the KTEN model considers zone-based ratios (by NUTS 2 or equivalent) and the trip purposes are business, leisure and visit (personal). Business trips generated depend on the work and study trips rates by group of age, internal trip rates to define the self-containing trips, and the external trip rates.

To determine both leisure and personal trips first maximum and minimum annual trip asymptotes, as well as annual commuting trips, per inhabitant are defined. Then leisure and personal annual trips depending on the GDP are calculated following a logistic function:

$$f(x) = A_i + \frac{1}{\frac{1}{A_s - A_i} + ab^x}$$

where A_s and A_i are the superior and inferior asymptotes of leisure and personal annual trips, a and b are parameters and x is the GDP per capita. The percentage of leisure trips regarding total leisure and personal trips is calculated with the same function. In this case x is the percentage of non-national inhabitants and A_s and A_i are the superior and inferior

asymptotes of the percentage of leisure and personal to total annual trips. The percentage of personal trips is the complementary of the leisure trips.

To calculate business trip distribution, KTEN uses the following expression:

$$V_{i,j} = O_i \cdot A_i \cdot K_{i,j}^\alpha \cdot Cap_j^\beta \cdot Pop_j^\gamma \cdot Gdp_j^\delta \cdot C_{i,j}^\rho$$

where,

- $V_{i,j}$ trips between zone (i) and zone (j)
- O_i the origins from zone (i)
- A_i calibration parameter to reach the Origins condition
- $K_{i,j}^\alpha$ relationship between the countries containing the zones (i) and (j)
- Cap_j^β capitality index (4 for European Capitality ,2 for capital of country and 1 for others)
- Pop_j^γ population of zone (j)
- Gdp_j^δ gross domestic product of zone (j)
- $C_{i,j}^\rho$ cost to travel from zone (i) to zone (j)

To calculate personal and leisure trip distribution, KTEN uses the following expression:

$$V_{i,j} = O_i \cdot A_i \cdot Cap_j^\beta \cdot Pop_j^\gamma \cdot Tp_j^\delta \cdot C_{i,j}^\rho$$

where,

- $V_{i,j}$ the trips between zone (i) and zone (j)
- O_i the origins from zone (i)
- A_i calibration parameter to reach the Origins condition
- Cap_j^β capitality index (4 for European Capitality ,2 for capital of country and 1 for others)
- Pop_j^γ population of zone (j)
- Tp_j^δ Tourist pressure on site of zone (j)
- $C_{i,j}^\rho$ cost to travel from zone (i) to zone (j)

The modal split is calculated considering the following percentages for every mode. The distance in km is from zone (i) to zone (j) using road network and ferry lines.

KTEN outputs are origin-destination matrix by trip purpose and mode at NUTS2 level for EU27.

Assignment is executed using All or Nothing assignment tools with BridgesNIS software on a multimodal graph with specific attributes on transport links and nodes.

3.2.1.3 KTEN freight model

A freight-forecast model for Europe has been developed with the aim to forecast main flows of freight between regions of EU25+2 (Switzerland and Norway), taking as starting point ETIS-BASE freight matrices to calibrate it.

ETIS-BASE is a 5th European Research Framework Project supervised by EC/DGTREN aiming to produce trans-European freight and passenger matrices at NUTS III level.

ETIS-BASE is responsible for the development of the reference database, which will be the core element of the European Transport policy Information System (ETIS). This European

database covering the EU 25 and EEA will become the reference database for European strategic modelling and focuses on TEN-T policy issues.

Transport scenarios

TEN-STAC project defines three scenarios for the horizon year 2020: TREND+, EUROPEAN, and EUROPEAN+. All scenarios incorporate the same common socio-economic assumptions, meaning a ‘normal’ economic development in all countries is considered:

- In the TREND+ scenario, basic policy actions are used to ensure the achievement of the White Paper aimed at the continuing liberalisation and harmonisation of EU transport for 2020. The infrastructure projects globally included in the TREND+ scenario mainly consist of the projects to be finalised in the year 2007.
- The EUROPEAN scenario includes a number of assumptions in addition to those in the TREND+ scenario. In this scenario, White Paper measures are not only applied globally, but also specifically on the trans-European Network and on specific infrastructure projects. The focus in the EUROPEAN scenario is on the accompanying measures dedicated to the selected infrastructure projects in order to support the intermodal transport. This scenario globally includes the infrastructure projects that will be finalised in the year 2013.
- The EUROPEAN+ scenario includes all the assumptions of the EUROPEAN scenario. In addition, the accompanying measures have been intensified and all infrastructure projects are included that are planned to be finalised in the year 2020.

At present, only the TREND+ scenario has been identified in the transport model database used to study transport scenarios (see following figures: road and rail infrastructure considered in TREND+ which are not in the reference scenario are represented in red).

Model development

Generation-Distribution

Seen the lack of available data, instead of modelling separately flow generation and distribution, the model estimates generation and distribution simultaneously, based on two basic parameters: GDP at origin (representing the capability to produce freight) and population at destination (representing the flows demand). In addition, a dummy parameter has been calculated to simulate the commercial relations between EU15 and the new member states, and possible EU members.

The expression used to calculate flows distribution follows a gravitational expression and is as follows:

$$V_{ij} = K_{ij}^{\alpha} \cdot GDP_i^{\beta} \cdot POP_j^{\gamma} \cdot e^{-\delta C_{ij}}$$

where,

- V_{ij} = Freight flows from zone origin i to zone destination j
- K_{ij} = Dummy parameter between country of zone origin i and country of zone destination j
- GDP_i = GDP for the zone origin i zone
- POP_j = Population at destination zone destination j

C_{ij} = Cost of travel between zones origin i and zone destination j
 $\alpha, \beta, \gamma, \delta$ = regression parameters

The cost parameter is a generalised cost, which considers the cost from the origin zone i and the destination zone j in each transport mode. The next exercise was to reproduce this parameter according to the ETIS-BASE original model of modal split. Due to the bad results, ETIS-BASE freight matrices for each transport mode have been taken as correct modal split. Therefore, the modal split from ETIS-BASE freight is applied directly to calculate the generalised costs for each origin and destination pair.

The model has been calibrated with the ETIS-BASE matrices in the reference year 2000.

Incremental model

To forecast flows in several time horizons, the model assumes the ETIS base values as base values for the year 2000 on which an incremental flow expressed as the relation between the base and future values calculated with the model is applied (see the following expression). The final flows are calculated as a product of the original ETIS flows and of a growth factor, obtained from the predicted variation of flows in the model.

$$V_{ij}^{fut} = V_{ij}^{ETIS2000} \cdot \left(\frac{V_{ij}^{MODELfut}}{V_{ij}^{MODEL2000}} \right)$$

where,

- V_{ij}^{fut} = future freight flows from zone origin i to zone destination j
- $V_{ij}^{ETIS2000}$ = freight flows in base year 2000 of ETIS-Base database from zone origin i to zone destination j
- $V_{ij}^{MODELfut}$ = future freight flows calculated with the model from zone origin i to zone destination j
- $V_{ij}^{MODEL2000}$ = freight flows in the base year 2000 calculated with the model from zone origin i to zone destination j

$$V_{ij}^{MODELfut} = (K_{ij}^{fut})^\alpha \cdot (GDP_i^{fut})^\beta \cdot (POP_j^{fut})^\gamma \cdot e^{-\delta C_{ij}^{fut}}$$

where,

- $V_{ij}^{MODELfut}$ = future freight flows calculated with the model from zone origin i to zone destination j
- K_{ij}^{fut} = Dummy parameter between country of zone origin i and country of zone destination j in horizon year
- GDP_i^{fut} = GDP for the zone origin i zone in horizon year
- POP_j^{fut} = Population at destination zone destination j in horizon year
- C_{ij}^{fut} = Generalised cost of travel between zones origin i and zone destination j in horizon year
- $\alpha, \beta, \gamma, \delta$ = Regression parameters

The generalised cost is calculated with the following expression:

$$C_{ij}^{fut} = \sum_n \%P_{ij}^{n\text{fut}} * C_{ij}^{n\text{fut}}$$

where,

C_{ij}^{fut} = Cost to travel between zones origin i and zone destination j in horizon year

$P_{ij}^{n\text{fut}}$ = Percentage of flows going from the zone origin i to the zone destination j with the transport mode n in the horizon year

$C_{ij}^{n\text{fut}}$ = Cost to travel between zones origin i and zone destination j with transport mode n in horizon year

The modal split (percentage of flows transported with each mode) formula resembles the logit distribution model, but it uses the variation of costs as input and not just the future costs, taking as initial value that of ETIS-BASE. The percentage of each mode is weighted by the cost variation from the base year to the horizon year with its respective power. The expression is as follows:

$$\%P_{ij}^{A\text{fut}} = \frac{\%P_{ij}^{A\text{act}} \cdot \left(\frac{(C_{ij}^A)^{\text{fut}}}{(C_{ij}^A)^{\text{act}}} \right)^{-\mu}}{\sum_n \%P_{ij}^{n\text{act}} \cdot \left(\frac{(C_{ij}^n)^{\text{fut}}}{(C_{ij}^n)^{\text{act}}} \right)^{-\mu}}$$

where,

$P_{ij}^{A\text{fut}}$ = Percentage of flows going from the zone origin i to the zone destination j with the transport mode A in the horizon year

$P_{ij}^{A\text{act}}$ = Percentage of flows going from the zone origin i to the zone destination j with the transport mode A in the base year

$C_{ij}^{A\text{fut}}$ = Cost to travel between zones origin i and zone destination j with the transport mode A in horizon year

$C_{ij}^{A\text{act}}$ = Cost to travel between zones origin i and zone destination j with the transport mode n in the base year

$P_{ij}^{n\text{act}}$ = Percentage of flows going from the zone origin i to the zone destination j with the transport mode A in the base year

$C_{ij}^{n\text{fut}}$ = Cost to travel between zones origin i and zone destination j with the transport mode n in horizon year

$C_{ij}^{n\text{act}}$ = Cost to travel between zones origin i and zone destination j with the transport mode n in the base year

KTEN freight model outputs are origin-destination matrices of freight transported by each type of mode at NUTS2 level for EU27.

3.2.1.4 Transport scenario definition

Of all the existing modelling scenarios mentioned in the section on transport scenarios, only the TEN-STAC project scenarios have been taken into consideration for the KTEN meta-model. The TEN-STAC project aims to design scenarios, to make traffic forecasts, and to analyse corridors on the Trans-European Transport Network in order to assess the impact of different infrastructure plans on the economies and societies of Europe.

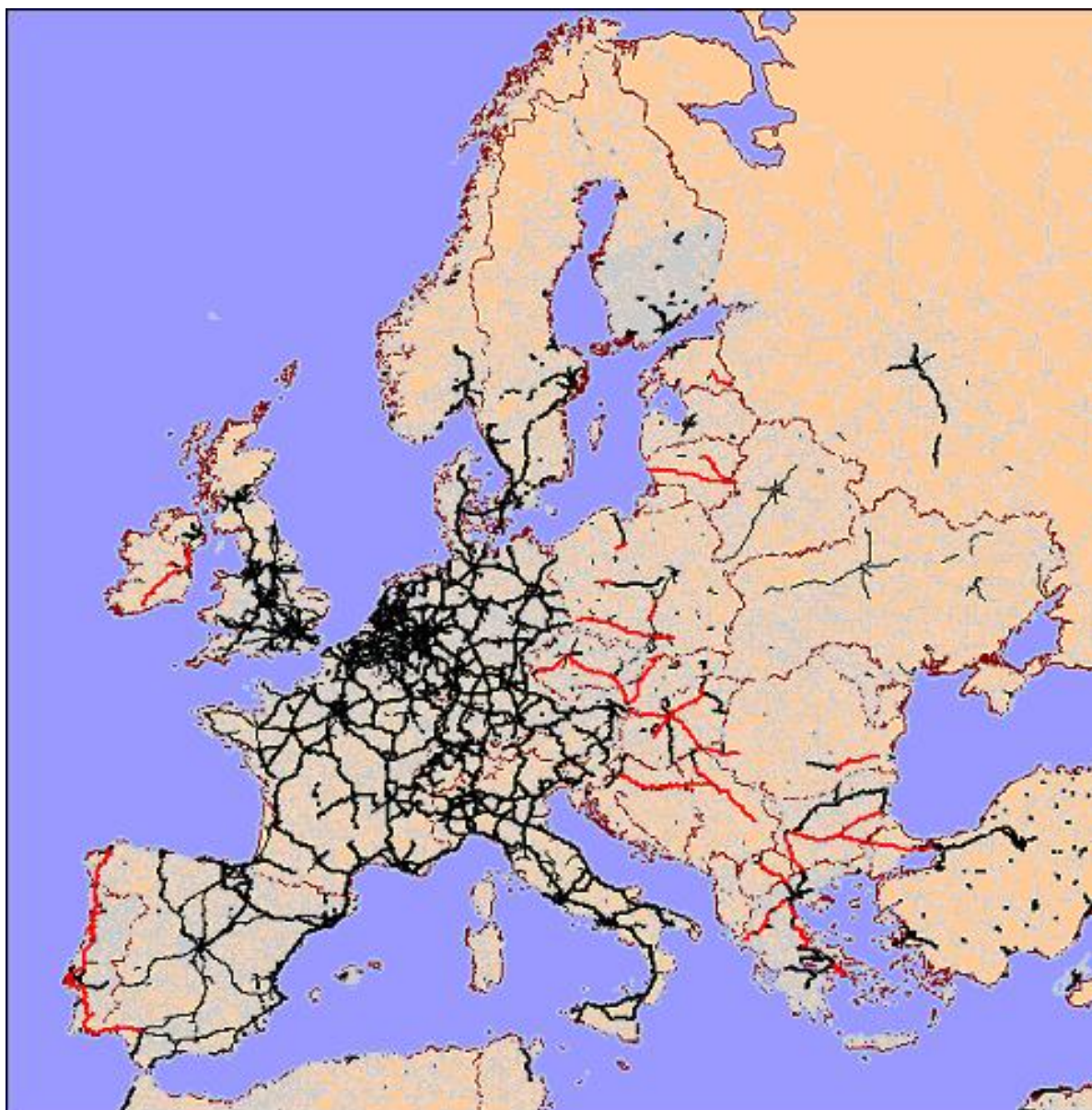


Figure 45 Infrastructure road projects included in Trend +.

Source: Own elaboration from TEN-STAC TREND+ scenario list of transport infrastructure projects.



Figure 46 Infrastructure rail projects included in Trend +.

Source: Own elaboration from TEN-STAC TREND+ scenario list of transport infrastructure projects.

The list of the transport infrastructure projects, both for rail and road, are taken from TEN-STAC project.

3.2.2 User-interaction with simulators

3.2.2.1 User-interface KTEN passenger model

As explained in section 3.1.2.4.1, the KTEN passenger model has three modules, for generation, for distribution and for modal split. Assignment on the multimodal transport network is executed using a transport oriented NIS model. The scenario parameters to calculate generated trips can be entered by region and by country, and the results of trip generation can be seen also by region or aggregated by trip purpose. The comparison of the results of the model with the values of STREAMS for each region is also available.

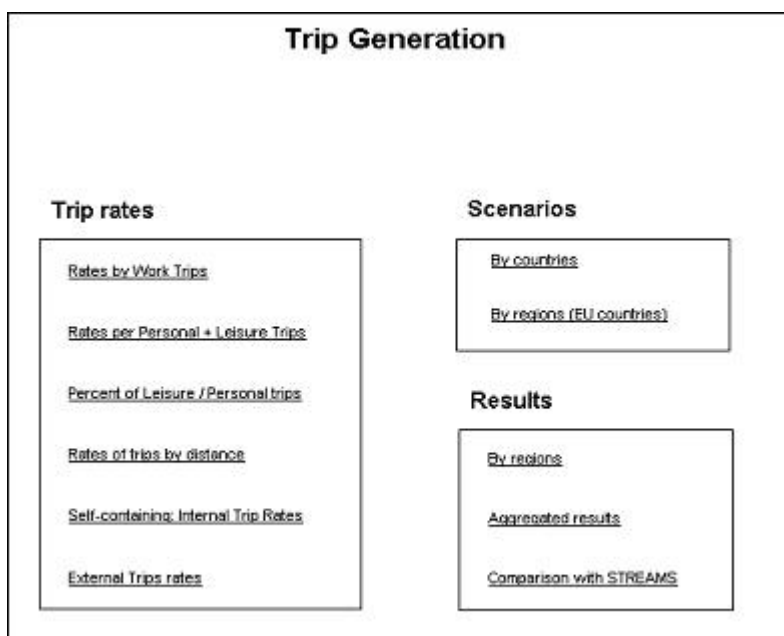


Figure 47 KTEN: Main interface of KTEN passenger model.

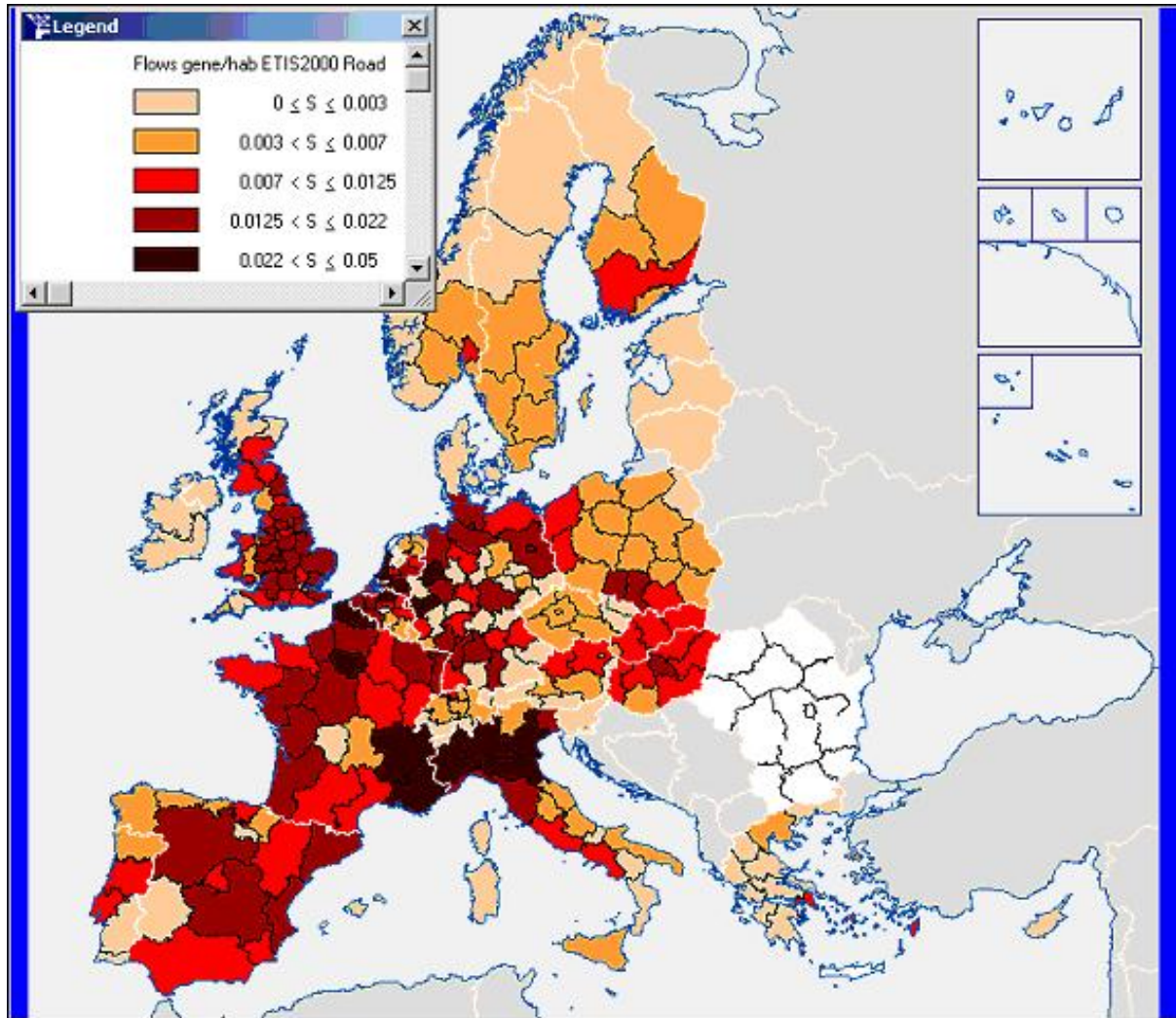


Figure 48 KTEN: Leisure and Personal trips by GDP interface of the Trip generation module

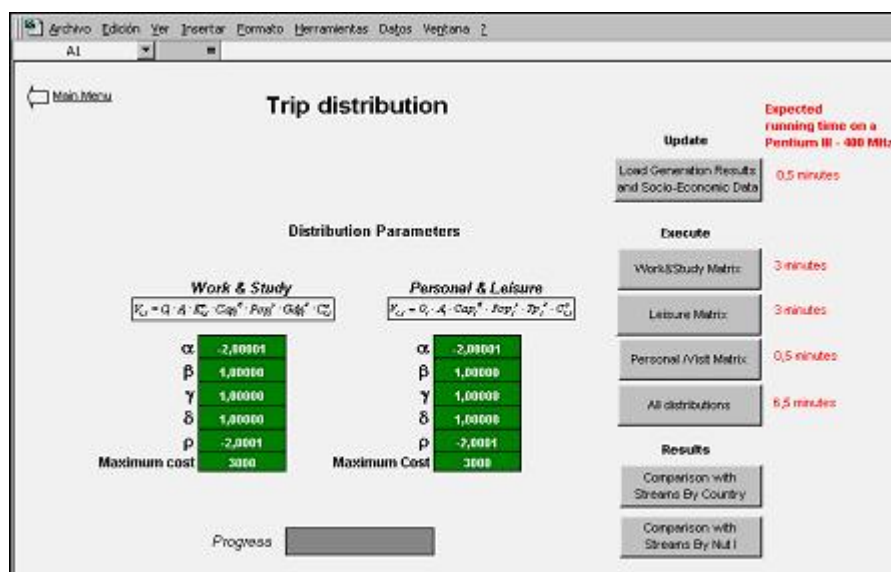


Figure 49 KTEN: Interface of the Trip distribution module

3.2.3 User-interface KTEN freight model

Currently the KTEN freight model has a main interface where the user has to define the Trends and the Policies. Cells in white are inputs concerning trends and policies that can be changed by the user:

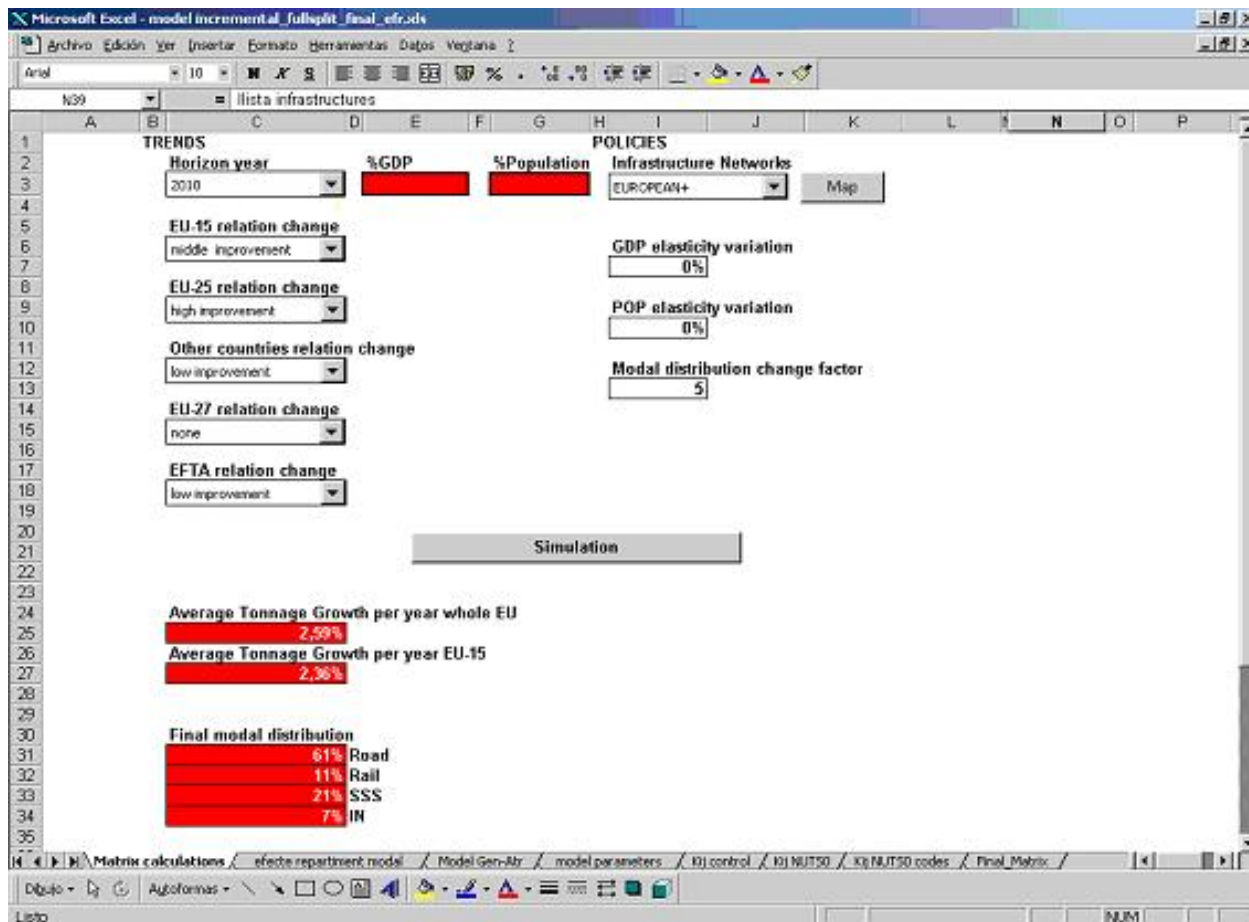


Figure 50 Main interface of the KTEN freight model.

a. TRENDS:

- Horizon year (2005, 2010, 2015, 2020, 2025, 2030). GDP and Population growths are taken from the Commission’s paper ‘European energy and transport trends to 2030’, where predictions are found for each five years until 2030. The model allows selecting these years as horizons.
- EU-15 relation change (none improvement, low improvement, medium improvement, high improvement).
- EU-25 relation change (none improvement, low improvement, medium improvement, high improvement).

- EU-27 relation change (none improvement, low improvement, medium improvement, high improvement).
- EFT relation change (none improvement, low improvement, medium improvement, high improvement).
- Other countries relation change (none improvement, low improvement, medium improvement, high improvement).

K_{ij} country relation values can be changed to reflect the improvement of commercial relations. They have been separated in 5 groups: EU-15, EU-25, EU-27, EFTA and others. Each of these groups can have different qualitative changes in their commercial relations: none, low improvement, middle improvement or high improvement. This qualitative change is translated into a percentage, which represents an increase in the flows per year, which ranges from 0% to 5-6%.

b. POLICIES:

- Infrastructure network scenario (TREND+, EUROPEAN, EUROPEAN+). Beside the Infrastructure network combobox the user has the possibility to visualize the infrastructure network corresponding to the chosen scenario by pressing the button 'Map'.
- GDP elasticity variation
- Population elasticity variation
- Modal distribution change factor

GDP and POP values are affected by a coefficient $(1+\varepsilon)$, which enhances or decreases their influence in the predicted flow (ε is the elasticity). This allows decoupling the growth of these two parameters with the traffic flows.

Once all parameters in the white cells have been chosen, the user presses the 'Simulation' button and the model calculates it and gives it as output in excel format.

Cells in red are also outputs and indicate:

- Average tonnage Growth per year in the whole EU
- Average tonnage Growth per year in EU-15
- Final modal distribution

Next tasks to be developed in the model will be:

- Interface with the description of the model
- Interface with the increase in GDP and Population considered for each horizon year.
- Interface with the results for each region
- Interface with the results aggregated for each country

3.2.4 Visualisation of results

3.2.4.1 Visualisation of traffic results from Trend+ scenario

As an example, regional forecasts produced by the KTEN freight model have been assigned on the transport network.

The parameters chosen to do this exercise are:

- Horizon year: 2020
- Country relation change:
 - EU-15 - middle improvement
 - EU-25 - high improvement
 - EU-27 - middle improvement
 - EFTA - low improvement
 - Other countries - low improvement
- Scenario: TREND+ (maps of infrastructure in TREND+ Scenario are represented in figures in chapter 3.1.2.1).
- GDP and POP elasticity variation: none
- Modal distribution change factor: 5

This results in an average freight growth per year of 2,59%. The following figure is an example of the visualisation of the traffic on transport infrastructure links after the assignment of the matrix result of this example.

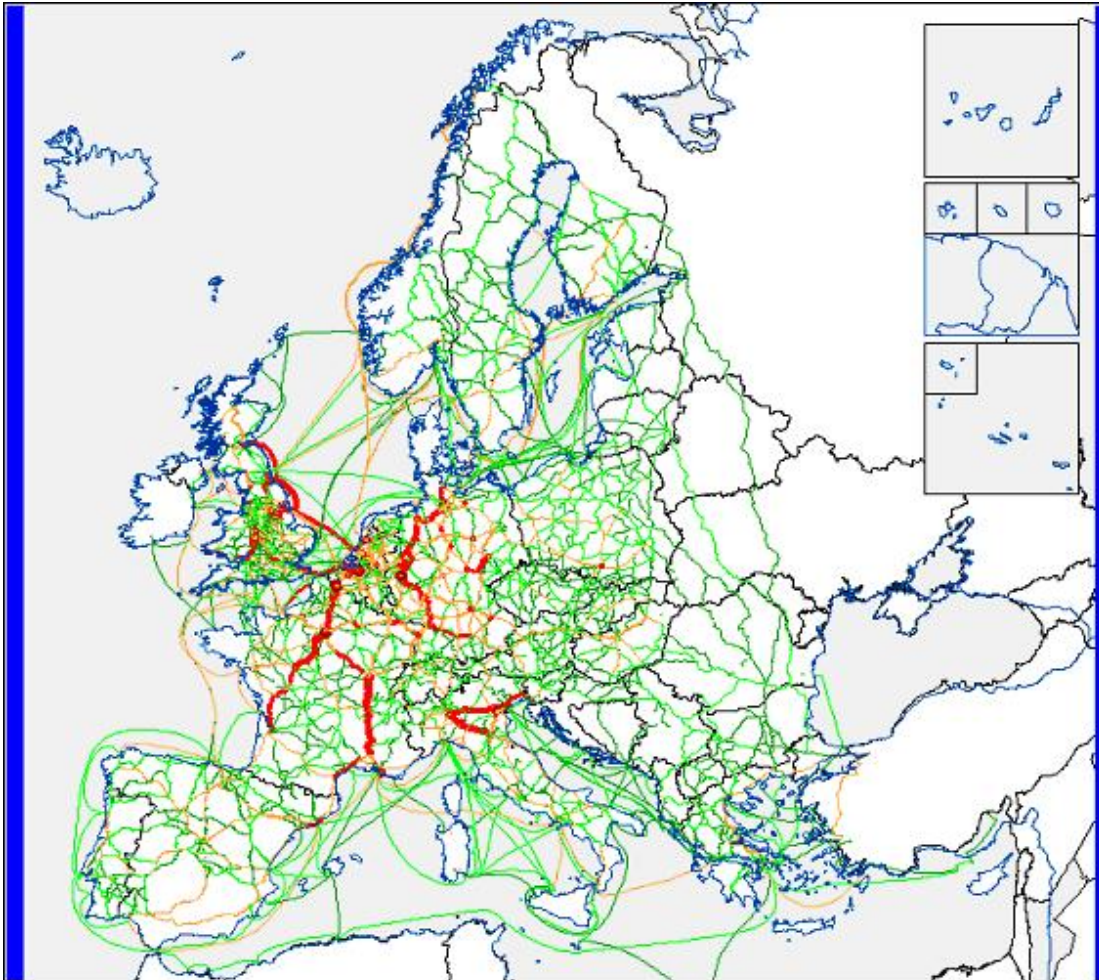


Figure 51 Freight flows transported by road and short sea shipping between regions in the Reference Scenario year 2000. Note that flows transported by short sea shipping are flows transported on land by road, rail and inland waterways, not only road.

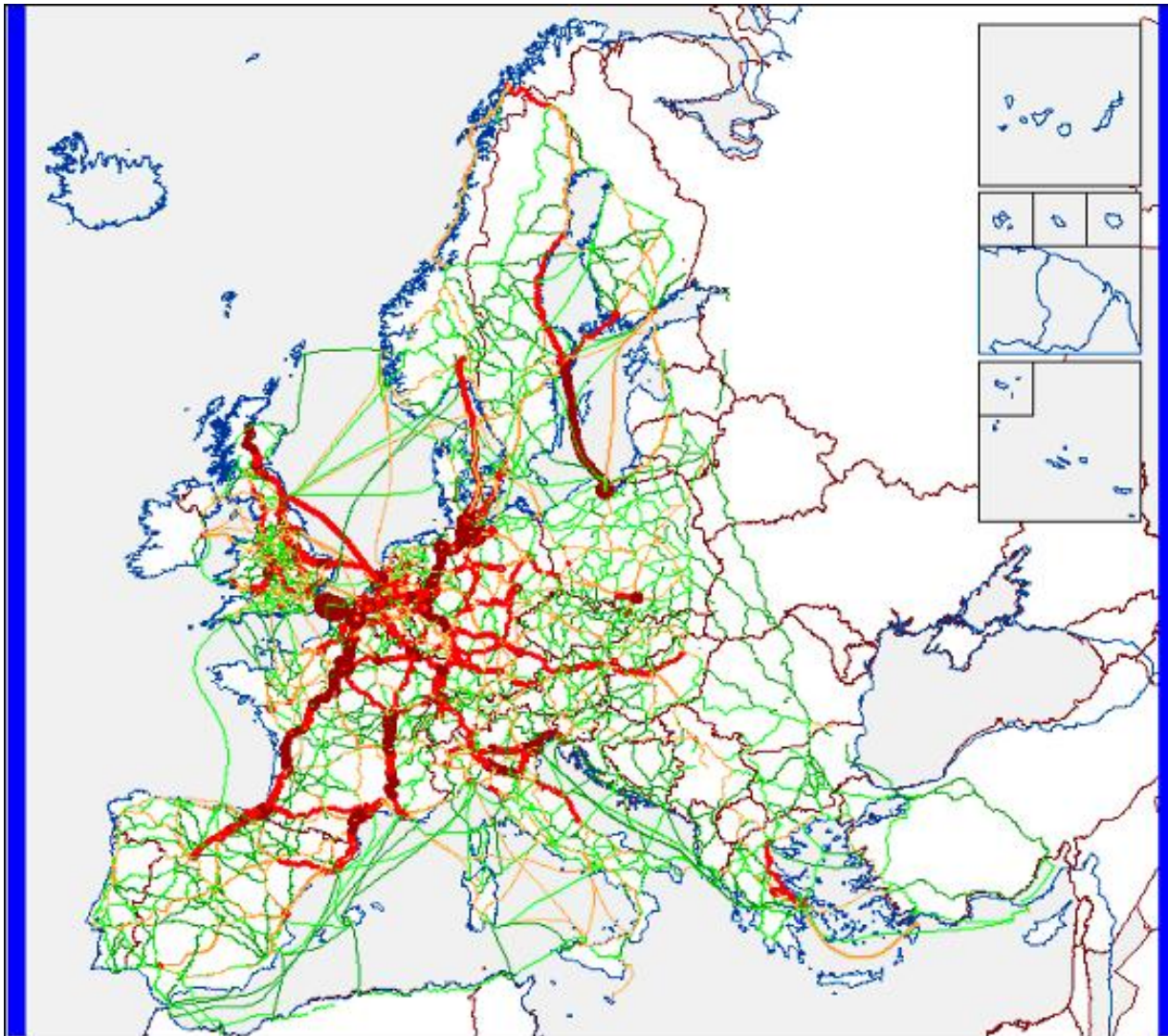


Figure 52 Freight flows transported by road and short sea shipping between regions in the TREND+ Scenario year 2020. Note that flows transported by short sea shipping are flows transported on land by road, rail and inland waterways, not only road.

This exercise allows to identify those projects which capture more traffic in Trend + Scenarios. As it is shown in next figures, the project of Lisbon-A Coruña motorway is a corridor that absorb a remarkable part of the flows, as well as the road projects in the Czech Republic, Hungary, the south of Poland and Greece, in Scenario Trend+.

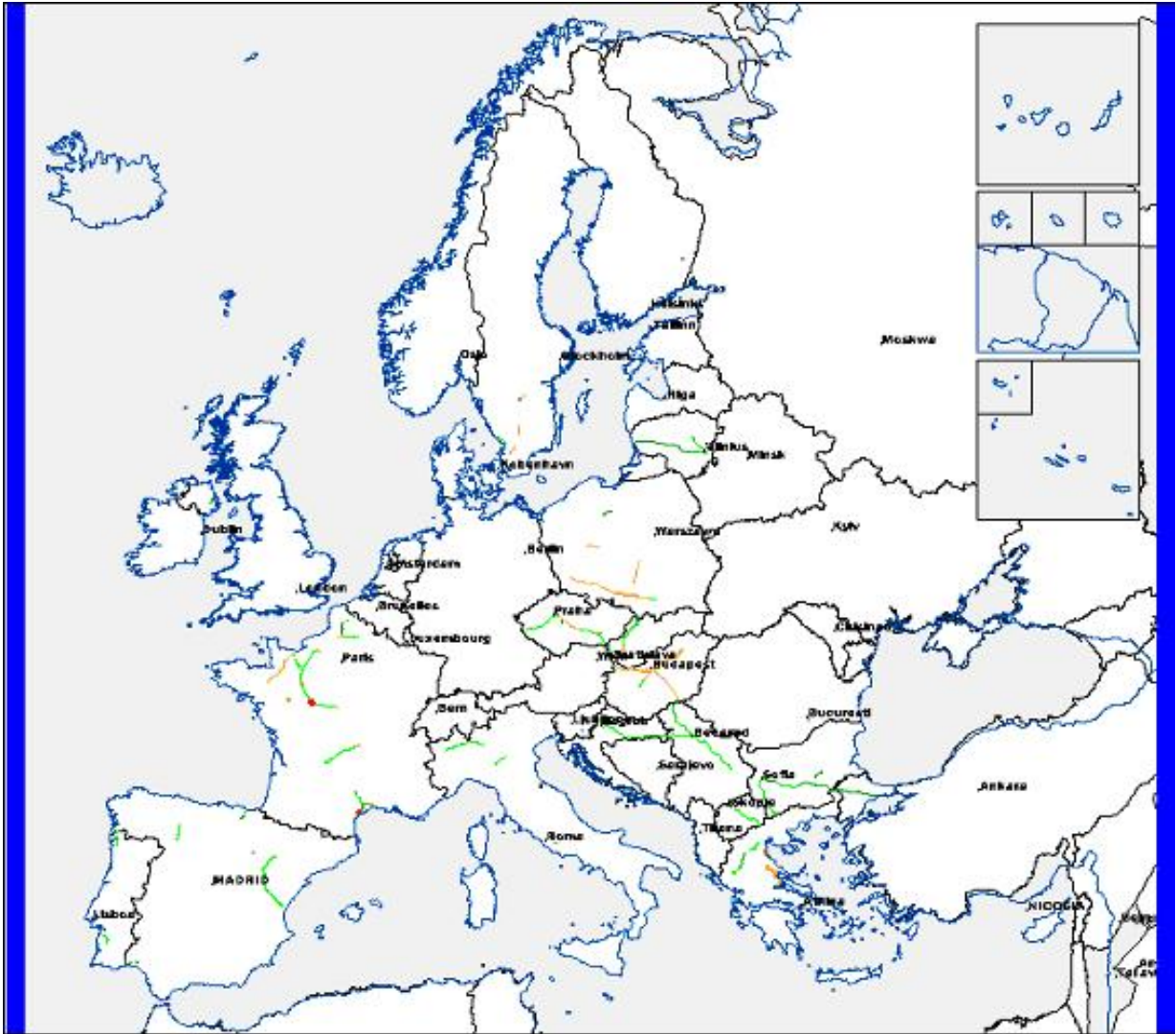


Figure 53 Traffic flow (in Mtonnes) on road projects of TREND+ Scenario, in Scenario base 2000.

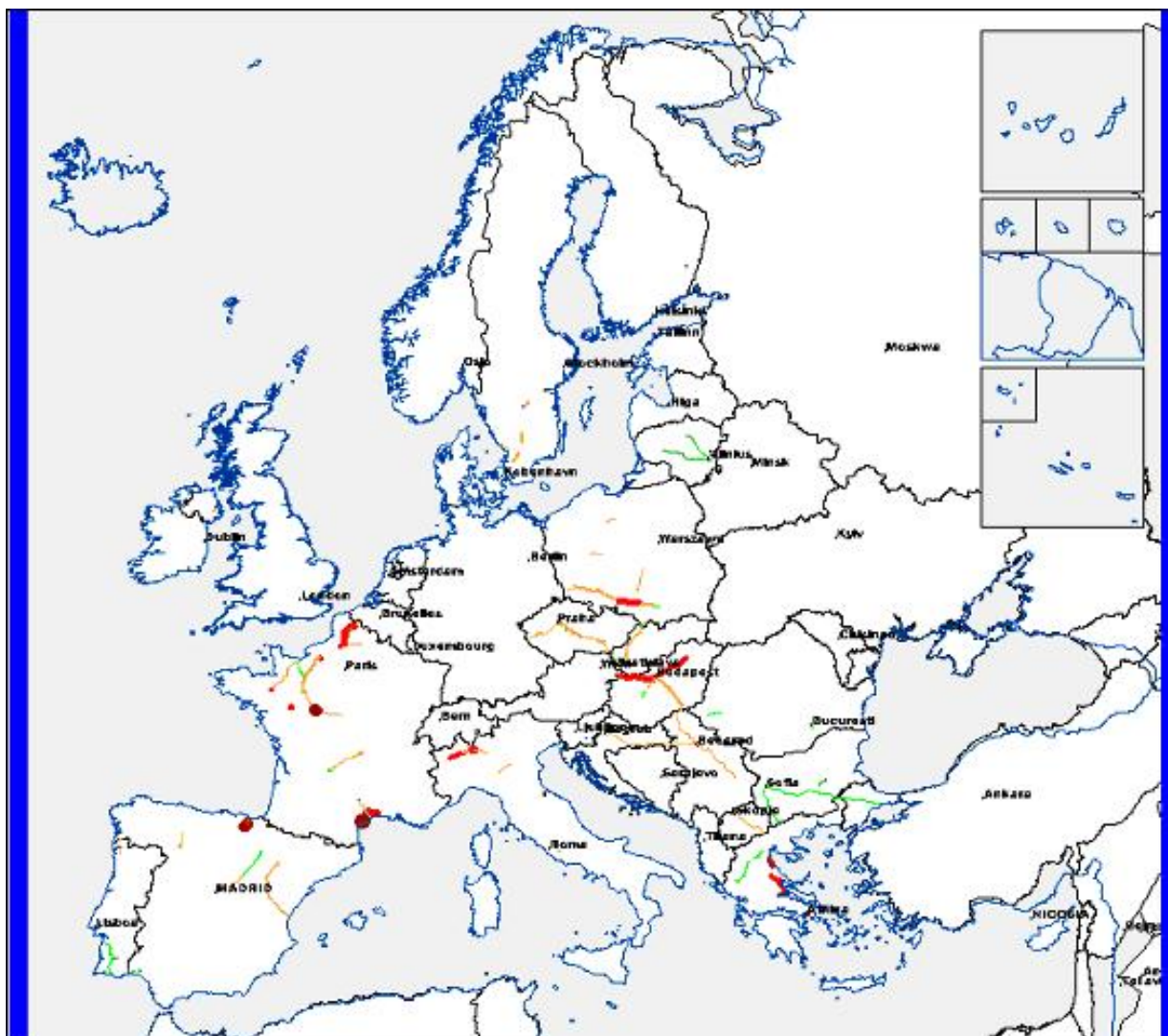


Figure 54 Traffic flows (in Mtonnes) on road projects of the Trend+ Scenario

3.2.4.2 Visualisation of regional trends from Trend+ Scenario

The origin-destination matrix of the freight flows transported by each transport mode allows to calculate aggregate results by region, like the absolute freight flows generated and attracted, the freight flows generated and attracted per capita, increase of flows generated and attracted in a specific scenario in respect to the base scenario, etc., with the aim to study the regional trends of these indicators for each scenario. The following figures represent these indicators for the Reference year 2000 and for the TREND+ Scenario in 2020, for road mode for generation of freight.

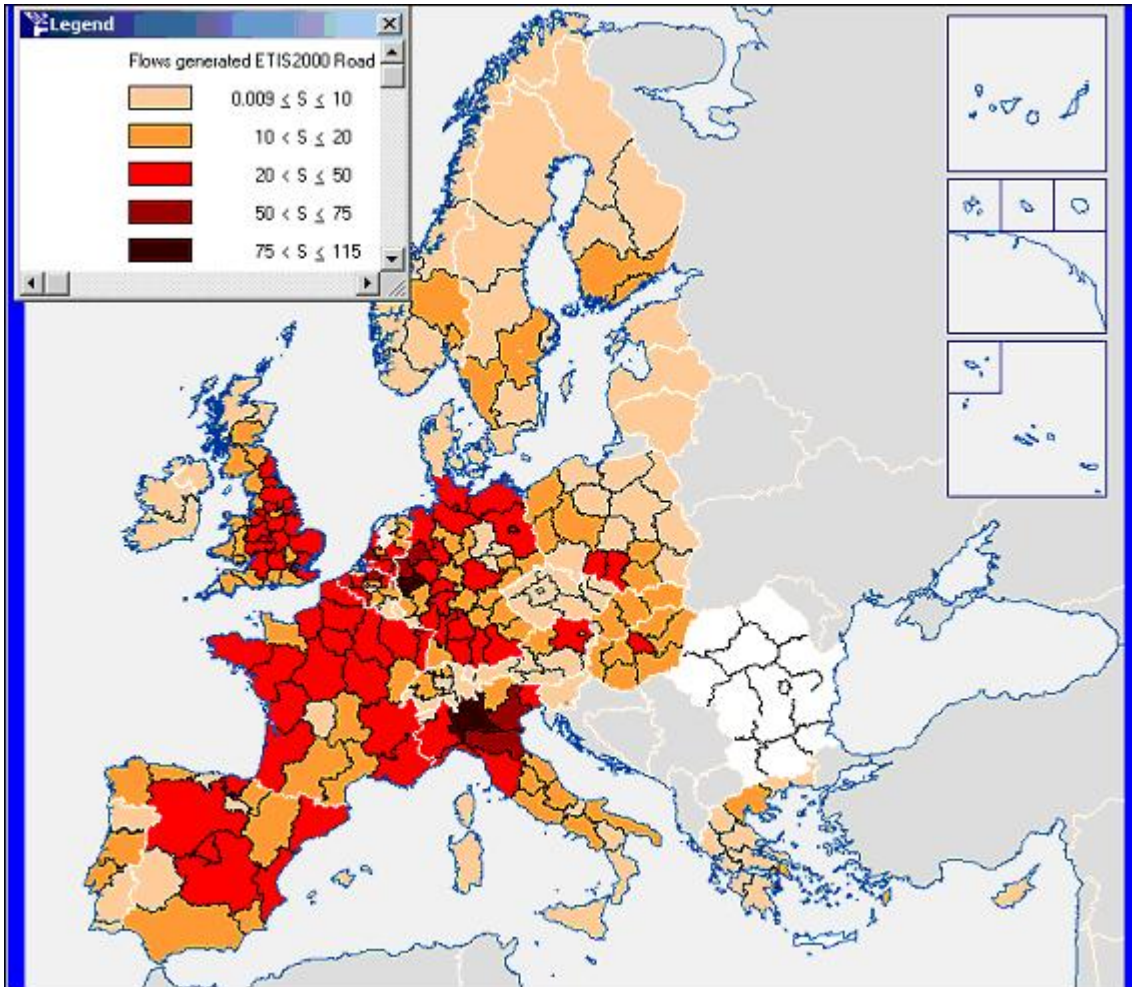


Figure 55 Freight flows transported by road generated in each NUTS2 in the reference scenario in the base year 2000 (in Mtonnes). Source: ETIS.

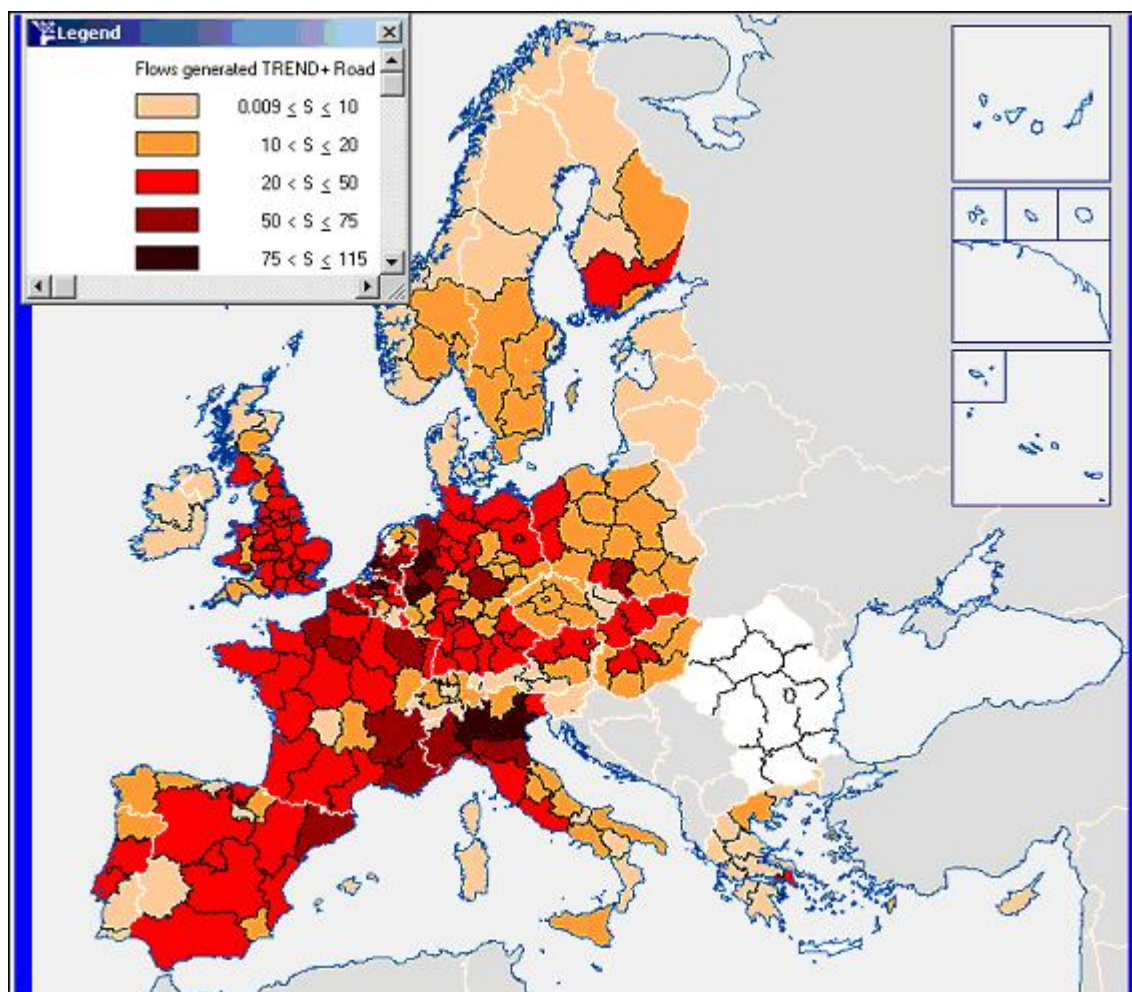


Figure 56 Freight flows transported by road generated in each NUTS2 in the TREND+ scenario and horizon year 2020 (in Mtonnes). Source: Own elaboration with results taken from KTEN freight model.

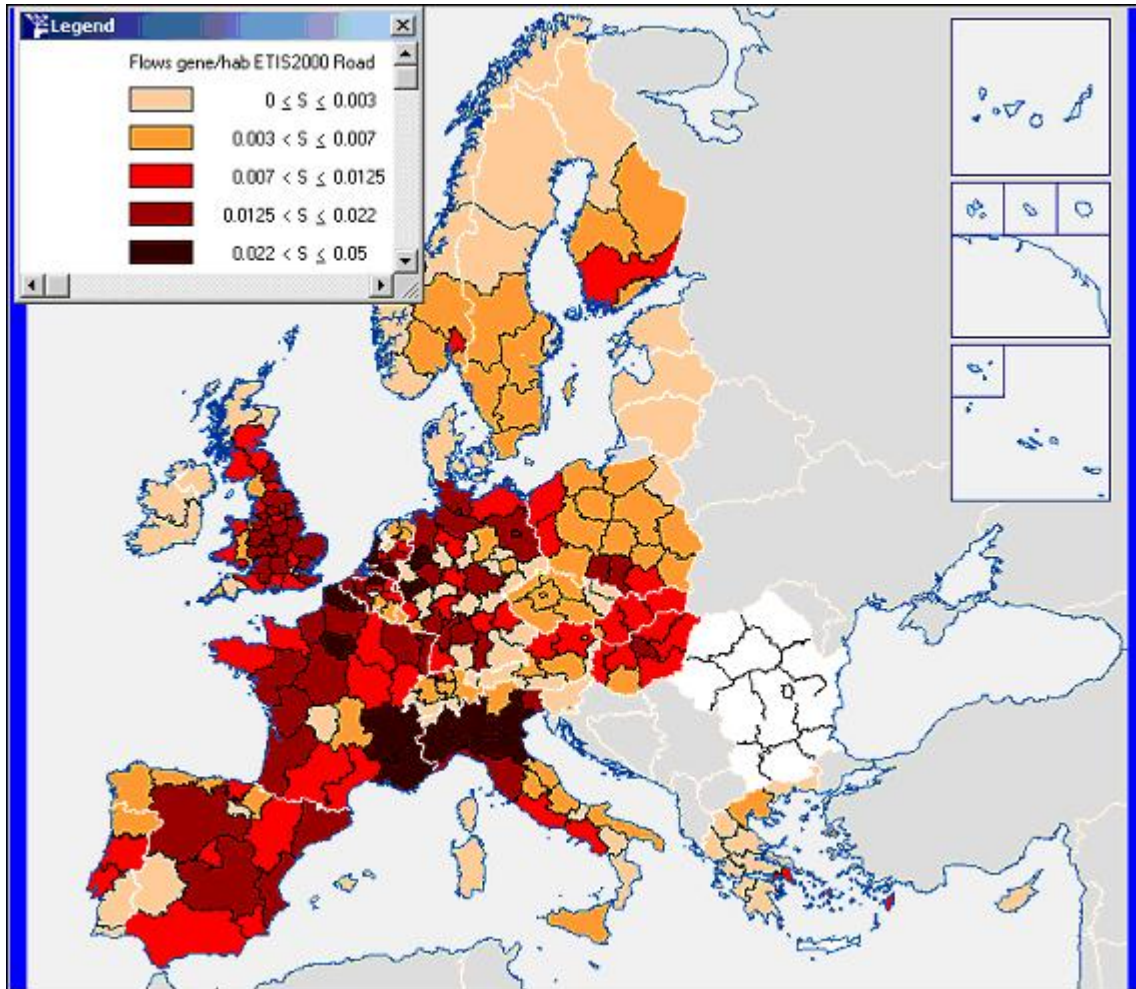


Figure 57 Freight flows transported by road generated per capita in each NUTS2 in the reference scenario in the base year 2000 (in Mtonnes/1000 inhabitants). Source: Own elaboration from ETIS data and ESPON database.

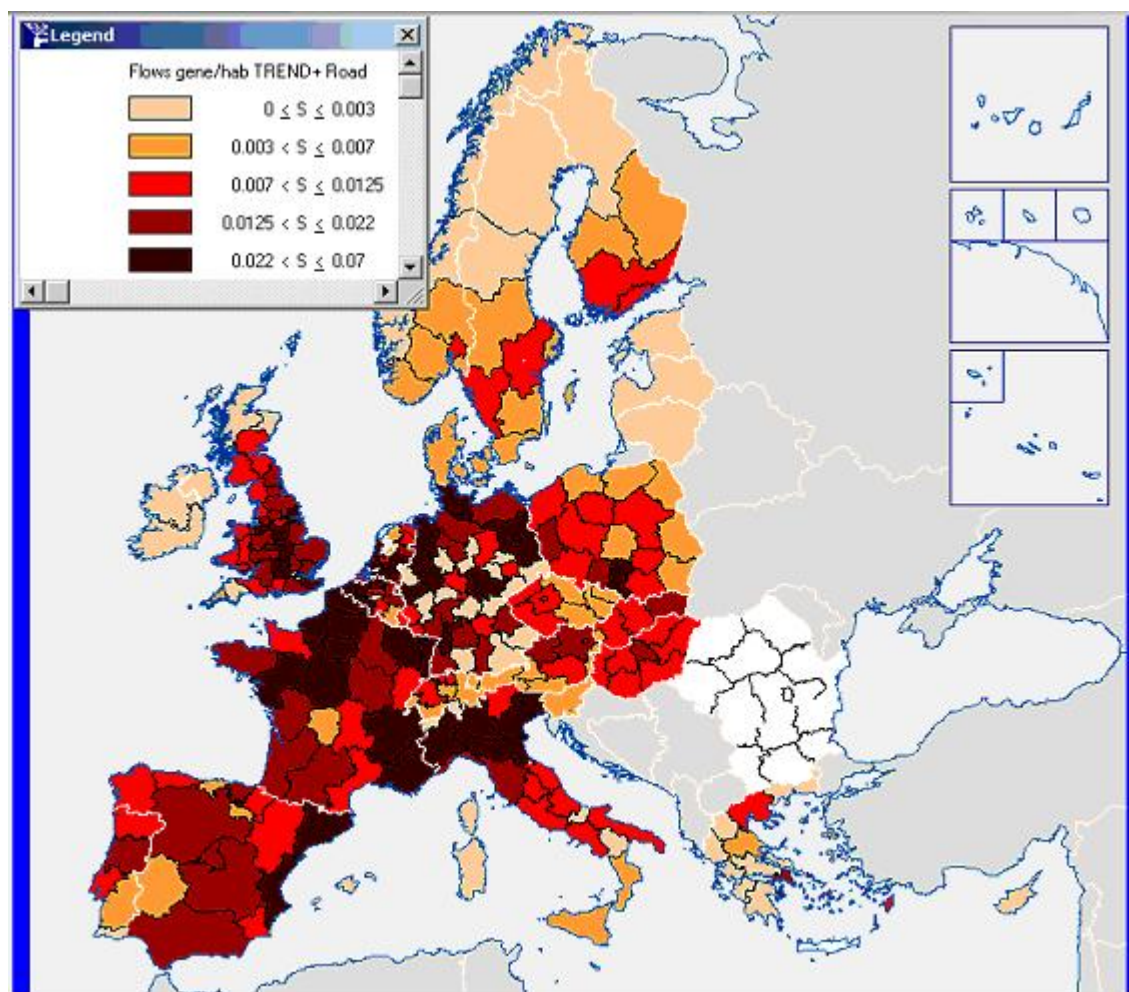


Figure 58 Freight flows transported by road generated per capita in each NUTS2 in the TREND+ scenario in the year 2020 (in Mtonnes/1000 inhabitants). Source: Own elaboration from the KTEN freight model.

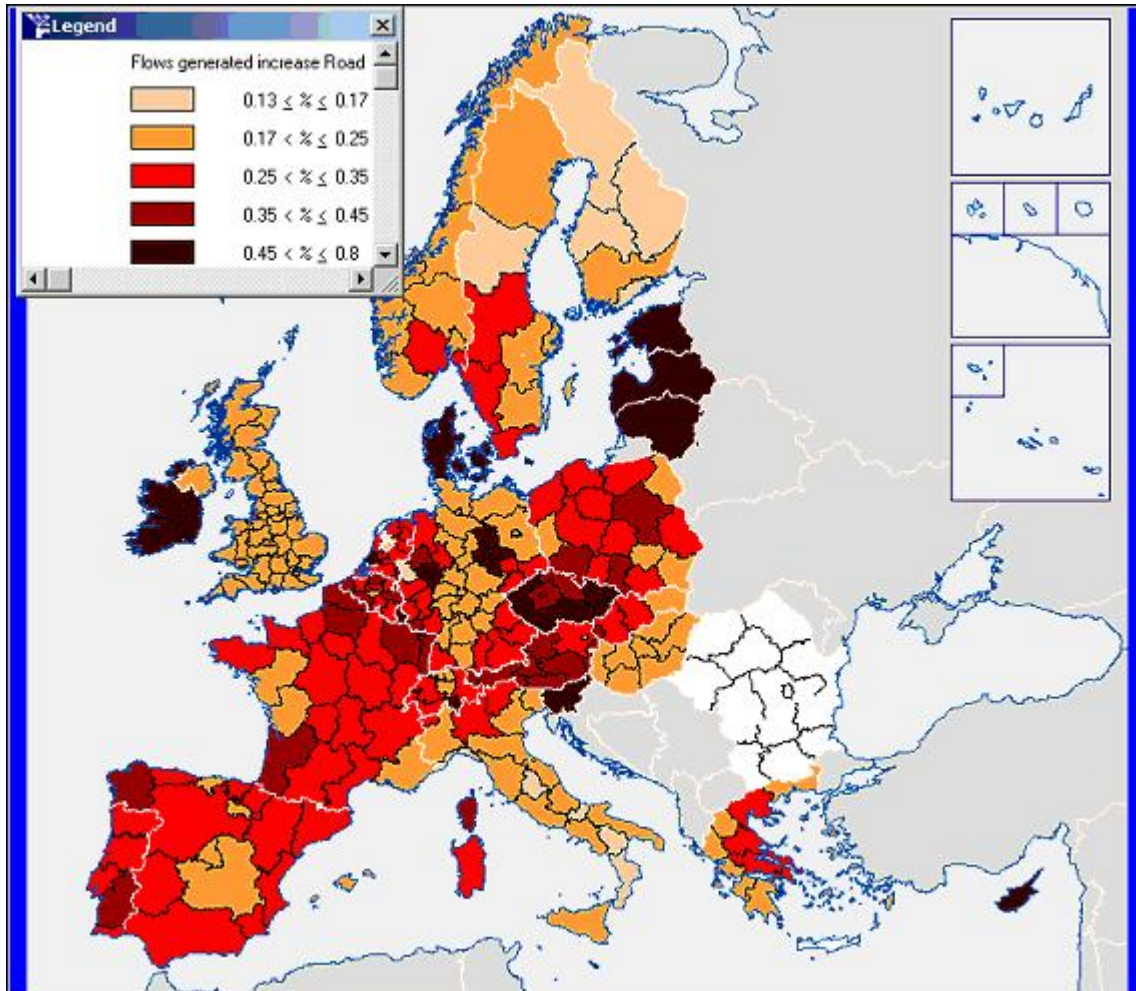


Figure 59 Increase of freight flows transported by road generated in each NUTS2 in the TREND+ scenario in respect to the reference scenario (in %). Source: Own elaboration with results taken from KTEN freight model.

3.2.5 Next steps until third interim report

- definition of indicators for the thematic transport scenarios and their introduction as parameters into the forecast models.
- consolidation of both models (interfaces, explanation of the parameters, etc.)
- execution of the models for each of the scenarios
- analysis of the results

3.3 Research on a European Territorial Cohesion Index (ETCI)

The aim of the research on a ETCI developed in ESPON 3.2 is to **develop a technical tool for evaluation of scenarios**. The introduction of the expression 'territorial cohesion' has introduced a confusion because the intention of the researchers engaged in this WP has neither been to propose any kind of global synthesis of previous ESPON results (as it was done with ESPON 3.1 RCE, Regional Classification of Europe), nor to propose any kind of criteria for the allocation of future structural funds during the period 2007-2013.

The initial idea was simply that each scenario should be evaluated in a quantitative way with a synthetic indicator which should take into account the three fundamental objectives of ESDP: economic competitiveness, social cohesion and sustainable development. This synthetic index should be better than GDP/inh. (which takes into account only the economic dimension) but should remain very simple because, in the framework of ESPON 3.2, it was necessary to estimate trends both in past (1960-2000) and future (2000-2030).

- **In a first round of research** (partly presented in the FIR of ESPON 3.2) we have tried to explore the literature on composite index (like Human Development Index) in order to realise a state of the art on the different possible ways to combine different criteria. We also explored the different ways to improve synthetic indices by innovative methods of spatial analysis like maps of discontinuities or discriminant analysis. In this first round of exploration we focused mainly on technical questions and used existing data (statistical annex from 2nd cohesion report) in order to support research but without in depth analysis of the quality of information. This first round of research has produced interesting results from a methodological point of view, but has also demonstrated that it was possible to introduce strong manipulation in the results: our fictive '*ETCI Lisbon index*' and '*ETCI ESDP index*' provide very different views on the distribution of lagging regions in Europe. If these fictive indices had been used for the allocation of future structural funds (which was not their aim!), the first one would have concentrated the funds on new member countries and the second on southern Mediterranean regions.
- **In the second round of research** developed since January 2005, we decided to postpone the research on statistical and cartographic tools and to focus more on the availability of data which could be used for the development of a composite index taking into account the three dimensions of ESDP and the definition of territorial cohesion proposed in the 3rd Cohesion Report and other recent political documents, namely the Treaty establishing a Constitution for Europe and the conclusions of the Rotterdam informal meeting of spatial planning Ministers (November 2004). This analysis of the data situation in regard to political expectations on territorial cohesion led to the pessimistic conclusion that it is probably **not possible currently to build any relevant index of territorial cohesion in the framework of ESPON database**. Indeed, only the economic dimension appears to be well documented, but very little information are available at regional level for the evaluation of environmental sustainability and practically nothing for social cohesion. This pessimistic conclusion (confirmed by the recent analysis of ESPON core indicators during a LP meeting) led us to explore different ways to complete the ESPON database by new measures of social cohesion. An attempt is done in the present report on the question of Health.

So this chapter is composed of three parts. In a first part, an end is put to the 'first round of research' with the review of literature on composite indices. The second part addresses the basic problem of linking statistical information and political action, especially regarding the

lack of social indicators. Therefore the third part explores the social dimension, with the example of health indicators.

3.3.1 From political objectives to composite indices: State of the art

Before asking the ways of building composite indices, the first step is conceptual: which are the main dimensions we want the index to be composed of? The recent official documents dealing with territorial cohesion give some inputs. Then the second step is methodological: how to combine the dimensions?

3.3.1.1 The different components of the concept 'territorial cohesion', according to the official documents

Territorial cohesion undoubtedly becomes a key concept in the spatial development debates at the EU level. Although recent, the concept is progressively imposed and more and more precisely defined by new official texts.

The concept of *cohesion* is absent from the Treaty of Rome (1957). The first occurrence can be found in the Single European Act (1986), under the title V of the EC Treaty, giving the Community new competence for economic and social cohesion and setting its objectives and means: 'In order to promote its overall harmonious development, the Community shall develop and pursue its actions leading to the strengthening of its economic and social cohesion. In particular, the Community shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least-favoured regions, including rural areas.' (article 23 of the Single European Act, article 130 of the EC Treaty). This entailed the reform of the Structural Funds' operational rules in 1988 – but the main criterion taken into account for the eligibility to the Objective 1 was economic (a GDP/inh. less than 75% of the European means).

The Maastricht Treaty (1992) also provides significant room to *cohesion* with the creation of the Cohesion Fund, aiming at helping each Member State to take part in the single currency. But the *territorial cohesion* concept cannot be found in the texts before the Amsterdam Treaty (1997). In the latter it is an isolated token about the services of general economic interest, as regards 'their role in promoting social and territorial cohesion' (article 7D). The concept has spread wider later on and can now be found in the Treaty establishing a Constitution for Europe (2004): 'The Union shall promote economic, social and territorial cohesion, and solidarity among Member States' (article 1.3, paragraph 3). Adding the adjective *territorial* means that the concept deals with something different from the economic and social fields... but what is it? The Treaty stays fuzzy on the topic, but two other documents are more explicit: the Third Report on Cohesion delivered by the European Commission in 2004, and the conclusions of the informal meeting of the spatial planning Ministers in November 2004 in Rotterdam.

Both documents put the impetus on the plurisectoral dimension of territorial cohesion: the cohesion which is promoted between the regions is not only economic but also social and environmental. Other dimensions are added to these three ones, like demography (the conclusions of the Rotterdam informal meeting namely stress the challenges related to ageing). So in a first approach, territorial cohesion encompasses the objective to lessen the disparities between regions, whatever their nature. Nevertheless, it cannot be limited to this to the extent that the word *territorial* carries additional meaning.

Taking the territory into account must be understood following two strands. In a first strand, citizens must have access to any essential services and basic facilities, wherever they live in the European Union. Thus the concept of accessibility / parity of access is central. This is also limited to flows and connections between regions. In a second strand, cohesion must be understood at several spatial levels, from the EU level with the related concern of disparities between highly economic competitive zones and less favoured areas, to the local level with the question of intra-urban discontinuities and the ghetto issue.

The temporal dimension is also present. The conclusions of the informal meeting of spatial planning Ministers point out that the territorial cohesion approach must be not only *integrated* (i.e being part of the whole set of policies, whatever the level of decision), but also *long term*. The policies have to be designed in the long term, and the analysis of territorial potentialities must, therefore, also take into account the territorial dynamics.

As a first conclusion, territorial cohesion is a notion at the same time plurisectoral and multiscalar. It must be understood not in a static but in an evolutionary way, and has to be integrated into policies in a 'multilevel governance'. In this respect, project ESPON3.1 delivered an interesting tool to understand and operationalise the concept: Hypercube, developed by Philippe de Boe and crossing the dimensions of *cohesion, territory, scale* and *time*⁸⁶.

This raises the question of representing *territorial cohesion*. Several spatial analysis and cartographic tools can be used. The multiscalar territorial analysis is a possible solution, crossing the territorial levels of the indicator chosen for describing territorial cohesion (situation of a region as compared with its neighbourhood, with its national level and with the European level⁸⁷). The analysis of discontinuities between contiguous units is another solution.

Besides, as accessibility becomes a central concern and as the essential services are taken into account, a particular stress must be put on measuring cohesion through accessibility to these services. The following map provides an example of such a representation, about accessibility to hospitals at the local level. The considered hospitals are those with basic services (for example the maternity hospitals are not taken into account). The data come from the 'Inventaire communal', survey carried out in each French NUTS5 localities in 1998, and asking local authorities which services are present in the locality, and in absence of the service to which other locality do the people go. The distance is Euclidean, between the centroids of the NUTS5 units.

⁸⁶ ESPON project 3.1, Integrated tools for European Spatial Development, 2nd Interim Report, 2003
http://www.espon.lu/online/documentation/projects/cross_thematic/816/2.ir-3.1.pdf

⁸⁷ cf. the annex A to ESPON 3.1 Third Interim Report:
http://www.espon.lu/online/documentation/projects/cross_thematic/2501/3.ir-3.1_annex_a_mta_oct_2004.pdf

Access distance to hospitals in the French départements (NUTS3) Charente and Charente-Maritime

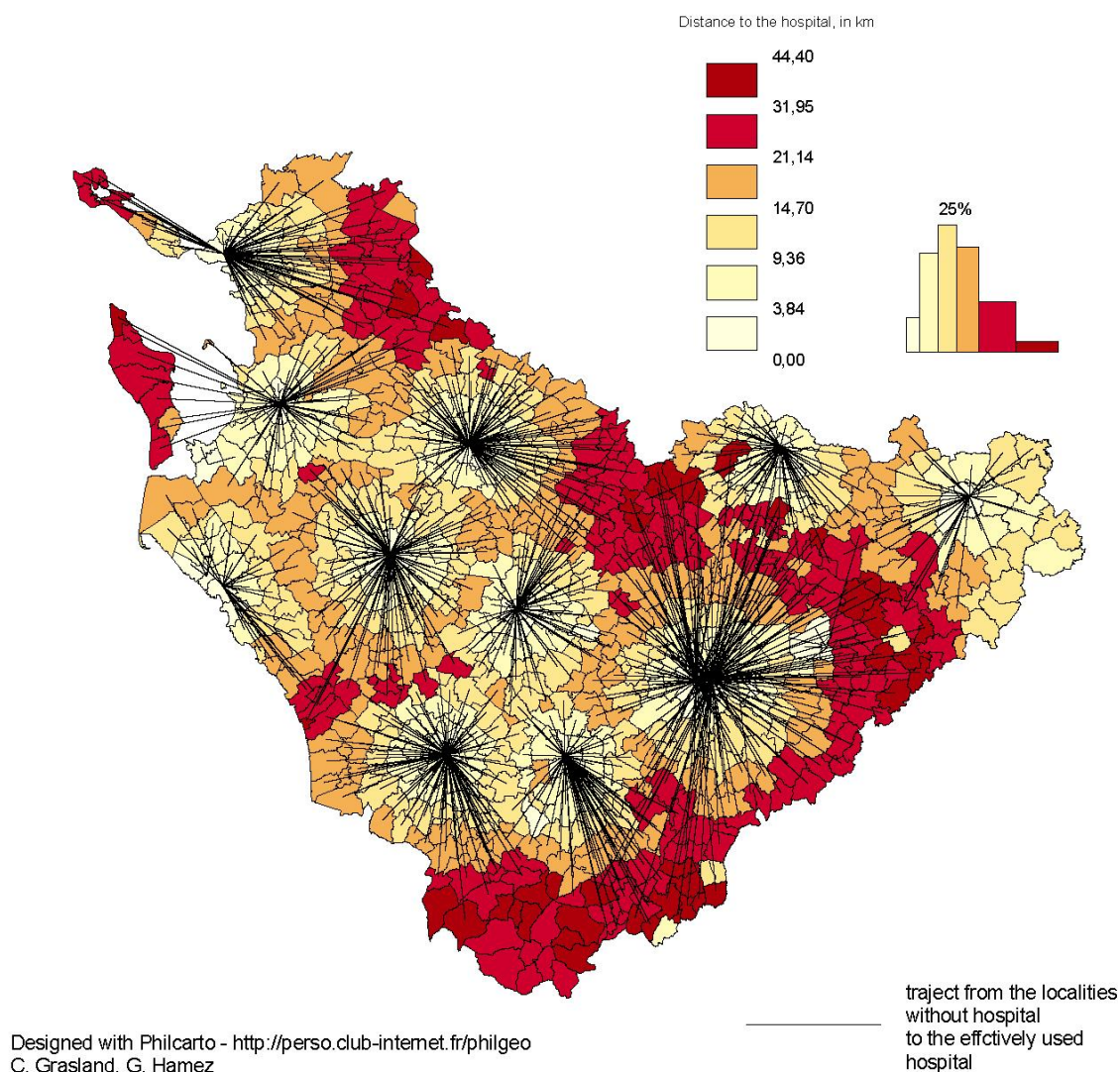


Figure 60 Access distance to hospitals in the French départements (NUTS2) Charente and Charente-Maritime

The map displays the discrepancy between NUTS 5 units as regards the parity of access to hospitals: a large number of localities are distant of more than 40 km to the hospital. Moreover, as the distance is Euclidean and not 'real' (for example in time), the actual distance by road is of course longer.

Such a map allows going into one side of the *territorial cohesion* concept, namely the social dimension – a dimension which is for the moment one of the least studied in the ESPON programme.

Nevertheless, territorial cohesion is a plurisectoral concept, and building an index in this respect imposes to combine different dimensions in one indicator. The Human Development Index, created by the United Nations, is here a rich source of information on the procedures of aggregating/ disaggregating the indicators. The review of literature allows to go further towards the ETCI, from a methodological point of view

3.3.1.2 Main properties of the Human Development Index

The HDI is supposed to be a 'summary measure of human development' (UNPD, 2003). The notion of 'human development' that underpins the HDI is inferred from the first articles of the Universal Declaration of Human Rights. Three essential dimensions have been kept: a long and healthy life, measured by the life expectancy at birth; the knowledge, measured by a combination of the adult literacy rate and the gross enrolment ratio; decent standard of living, measured by the GDP/inh. (in purchasing parity standard). Thus the political text (the Universal Declaration) guided the choice of the indicators.

The HDI has also a popularization property: the indicator must be easily understood both by the policy makers and by the general public. It results on the one hand in an annual ranking of countries according to their level of human development, on the other in temporal evolution series.

From a methodological point of view, the HDI was presented as an evolutionary indicator, right from the first report, promised to successive improvements along the annual publications of the *Human Developments Reports* (HDR). Actually, building the indicator raises questions in terms of data availability, normalisation/ transformation into index, weighting between the three criteria, and the possibility to add other dimensions. Mahbub ul Haq, the creator of the HDR, was aware of these limits. His colleague Amartya Sen, Nobel laureate in economics, recalls that 'the crudeness [of the HDI] had not escaped Mahbub at all. He did not resist the argument that the HDI could not be but a very limited indicator of development. But after some initial hesitation, Mahbub persuaded himself that the dominance of GNP (an overused and oversold index that he wanted to supplant) would not be broken by any set of tables. People would look at them respectfully, he argued, but when it came to using a summary measure of development, they would still go back to the unadorned GNP, because it was crude but convenient' (Sen, 1999). A strong parallel can be drawn with the current situation of the European regional policy, to the extent that the GDP/inh. remains the reference indicator in the political debates (Grasland, 2004).

3.3.1.3 Methodology for building a composite index, according to the HDI example

Many articles were published after the creation of the HDI in 1990, assessing the HDI limits and proposing methodological changes and new complementary indicators (Human poverty index, Gender-related development index, Gender empowerment measure...). This literature proves useful to set out a composite indicator applied to the European regions.

Amongst the general qualities of the HDI, several authors acknowledge the indicator helped opening again the debate on measuring the development, even if methodological critics can be addressed to the indicator (Fukuda-Parr 2001, Sagar & Najam 1998, Streeten 1994). The discussions about development crossed the disciplinary boundaries, to the extent that the questions were no longer dealt by the only economists, and helped bringing together scientific concerns with political ones.

Nevertheless the HDI is subject to numerous criticisms. The first one is related to the availability, quality and comparability of data (Chamie 1994, Srinivasan 1994). For example, 40% of the countries (for a total of 171 countries) have no data on the gross elementary enrolment ratio (Loup & Naudet 2000). In this case the data necessary to build the HDI are estimated; in other cases, when the data exist but are of bad quality, the

correcting procedures are highly problematic. The data concern questions the reliability of the HDI.

The transformation of variables is also subject to criticisms, particularly concerning the GDP/inh. In the first version of the HDI, the GDP/inh was transformed through a complex pseudo-logarithmic formula corresponding to a piecewise affine function, such as above a level of wages, the increase of GDP changed only in a tiny way the ranking of the standard of living component of the HDI. So the intervals between countries above 6000\$/inh were cancelled. Sagar & Najam criticize this transformation with the example of Switzerland and Mexico as both countries appear in the Human Development Report of 1997: although the Switzerland level of GDP/inh is nine times higher than the Mexico level, the transformation leads to almost identical values (the GDP/inh in Switzerland is only 3% more than the Mexico one...) (Sagar & Najam 1998). The authors propose a uniform application of the logarithmic transformation to avoid such results. This has been inserted in the HDI calculation from 1999⁸⁸.

The way of aggregating the three dimensions of the HDI is also questioned. It is just an arithmetical means. But the addition supposes that the three criteria can be perfectly substituted to each other, and that a weakness in one can be compensated by strength in another, which is a reductionist point of view as regards the usual meaning of 'human development' (Booyesen 2002, Desai 1991). Some suggest using a log-additive function to avoid this problem (Desai 1991). Others propose to multiply the variables instead of adding them up, in order better to take into account the case when a variable is far lower than the two others (Sagam & Njar 1998).

Besides, some underline the limits of the composite index as regards the possibility to compare the levels of HDI through time. Each year, new countries are considered and this modifies the ranking; the same happens with the methodological changes. When the HDR is published, a retrospective ranking of countries is certainly provided following the latest method. But such evolutions cause significant changes. As S. Morse put it, after a comparison of the different methods used by the UN year by year for calculating the HDI, the results display a large volatility: differences following the minimum and maximum values considered for the index of life expectancy, differences if the index of wages is calculated with the Atkinson formula or the integral logarithmic formula... (Morse 2003). In fact the HDI would be nothing more than a statistical artefact according to some authors (Lüchters & Menckhoff 1996).

Last, the HDI is also criticized concerning the dimensions it does not take into account. For example the indicator does not hold any measure of the infra-national and inter-personal inequalities. Each of the three dimensions should ideally include such information. (Hicks 1997). Others ask for taking into account the environmental and sustainable development dimensions in the HDI (Morse 2003, Neumayer 2001). These experts' discords often hide a balance of institutional powers between different world agencies, with the classical split noticeable at the European level between the socio-economic specialists (Eurostat) and the environment specialists (EEA).

As far as the last point is concerned, the literature related to the human development indicator differs from the one related to the sustainable development indicators (SDI): the former being more top-down oriented, from policy goals to their translation into indicators, the latter being more bottom-up and would run from data (Morse 2004). As our study of a composite index in the European framework is more HDI-like, we will not present here the contribution of the SDI literature, although it is as dense as the HDI one. But in this field

⁸⁸ This change modified the ranking of countries, namely allowing the countries with a high level of GDP/inh but a poor education or health policy to gain several places (USA, oil monarchies, etc.). It is difficult not to wonder about the political pressures preceding this revision...

the 'Dashboard of sustainability' needs to be quoted, as internet software allowing the user to combine several indicators upon request (<http://esl.jrc.it/envind/dashbrds.htm>). But the dashboard does not go into the regional divisions. There is another important difference with the work undertaken in the ETCI: the dashboard has no territorial dimension. Anyway, the dashboard is interesting in terms of reviewing available data and handling the data.

At this point, the general problem of the ETCI becomes obvious. 'Territorial cohesion' is a multisectoral concept, and requires combining different dimensions (namely economic, social and environmental, in concordance with the three principles of the ESDP) in a territorial framework. But the question of data is crucial: in case of a lack of data on one or several of the different dimensions, the possibility of building a composite index falls short...

3.3.2 The vicious circle relating statistical information and political action

According to the previous state of the art, we have a good view on the possible statistical solution for the elaboration of a composite index which could combine the three dimensions of ESDP (as the HDI combines the three dimensions of human development). We have also sufficient ideas on cartographic and spatial analysis tools which could be used for the exploitation of such an ETCI. And we are aware of the expectations of the other working groups of ESPON 3.2 who expect inputs for the evaluation of various scenarios.

But now we have to enter the crucial problem of data availability on the three dimensions of the ESDP. Is it really currently possible to find consistent data on each of the three dimensions, and to be able to measure an ETCI not only at one period of time (2000), not only at an aggregated level (state) but at a regional level (minimum NUTS1) and for different periods of time?

3.3.2.1 Pessimistic results of the analysis of ESPON Core indicators (LP Meeting, Feb. 2005)

During the Lead Partner Meeting of 17-18 February 2005, the list of core indicators developed so far in the ESPON framework by the TPGs was examined with scrutiny. This list of 103 indicators looks varied at first glance, but at second glance there is an important dimension missing: the social. In fact only 4 of the 103 indicators can be considered as social:

- pupils by educational level (developed by the TPG 112 at NUTS3)
- educational level of population (developed by TPG 3.1 at NUTS3)
- unemployment rates (developed by TPG 3.1 at NUTS3)
- impact of accessibility changes on unemployment (developed by TPG211 at NUTS3)

There are other indicators indirectly related to the social dimension, for instance the diffusion of Internet or cellular phones, or the proportion of households with PCs (indicators developed by the TPG 122). Nevertheless these indicators are more 'mixed' than social and are highly dependant of the date of data collection (for example the diffusion of broadband access to Internet can double in one year).

What are missing are truly social indicators, for example:

- wages calculated not through the means but the quantiles (decomposing the wages following the 10% poorer, the 10% richer, etc.) in order to investigate inter-personal disparities;

- wage differences between males and females, following the means and the quantiles;
- share of 'low wages' in the total of workers;
- share of teen-agers leaving the educational system without any qualification;
- life expectancy.

These few examples intend to show that it is possible in the ESPON framework to explore the social dimension, although it has not been a primary focus so far. In the next round of ESPON projects (the eighth), a new project is foreseen on the social dimension and may begin reviewing the availability of social data. But its results will not be provided before the end of 2006, so it is still necessary in the framework of the ETCI to begin going ahead on the question of social indicators.

3.3.2.2 Lisbon Vs ESDP ? Should we reduce territorial cohesion to economic competitiveness ?

The actual situation of the ESPON database (which is also the situation of EUROSTAT) has produced a vicious circle. As most available indicators are related to economic situation and competitiveness, most ESPON studies are related to these topics. Reversly, as very few information are available about social cohesion (and at a lesser degree about sustainable development), most ESPON studies ignore these crucial dimensions of ESDP. Therefore, if the results of the ESPON programme are used by policymakers, they will one more time reinforce the usual domination of one dimension of the ESDP (economic) and comfort the common feeling that the other dimensions (social & environmental) are not really important for the future.

The focus of the new European Commission on *Lisbon Strategy* can be interpreted as the consequence of an ideological choice, related to the domination of right-wing political forces in the European Parliament. But it is certainly also the result of a technical problem which is the lack of production of indicators of good quality, outside the economic dimension. This domination of the economic dimension is also a consequence of the clear domination of economists in the expert panel which is usually consulted by the European Commission. Geographers, sociologists or demographers are less often consulted and their opinion is less frequently taken into account. The situation is not so critical for the environmental dimension as for the social dimension, because the EEA or JRC are able to deliver regular information of good quality which can support policy orientations like the *Gothenburgh Strategy*. In the current statistical situation of EU, even if a left-wing majority was elected at the European Parliament, this majority would face very difficult problems in the development of a *Social Agenda*, because relevant statistical information is not available and it is impossible to develop a policy without good indexes for ex-ante and ex-post evaluation.

In the current statistical situation of the European Union in general (and the ESPON Programme in particular) it is impossible to build any relevant index of territorial cohesion at regional level which could combine the three dimensions of ESDP. It is certainly possible to build an index of economic competitiveness (Cf. work in progress of TPG ESPON 3.3 on Lisbon Strategy). It should be possible, even if difficult, to build an index of sustainable development (Cf. previous work of TPG ESPON 132 on 'cultural heritage', and foreseen work of TPG241 on 'Environment'). But it is actually not possible to elaborate any good index of social cohesion⁸⁹.

⁸⁹ This lack of information on the social dimension of ESDP has been pointed out by two panel groups working on the core indicators of the ESPON database during the last LP meeting of February. The panel groups also noticed that even when information are available (labour forces, economy, accessibility ...) it is not possible to evaluate

3.3.2.3 Breaking the vicious circle

Option 1: Asking EUROSTAT or ESPON II to elaborate new data collection in the future

It is possible to address recommendation to EUROSTAT for the elaboration of target indexes of social cohesion... but these indices will not be available before many years. If we want to break the vicious circle described above, we have to imagine immediately innovative solutions for the estimation of indices measuring the social cohesion at regional level.

Even in the last months of ESPON I, waiting for the 8th round of projects, it would be very interesting to pave the way for the social dimension with a project exploring the different possible social indicators.

Option 2: Trying to estimate target phenomena with proxy variables available at NUTS 2

In the Human Development Index, the 'long and healthy life' is measured by the life expectancy at birth. Of course, this is only a rough estimate of well-being, but the indicator has several interests: it displays an instant picture of the weighted mean age of a population in a territorial unit, and is comparable with the other units; it can be computed at NUTS2; long term series are possible.

Other demographic variables can be proposed, like the comparative rate of mortality. Some inputs are expected from the final report of TPG 114 – Demography.

Option 3: Using long term series available at national level for regional estimations

The most interesting indicators of social cohesion are generally available at national level but not at regional level. It is for example the case of measures of social inequality (e.g. distribution of incomes by deciles), measures of social well being (e.g. health expenditures per inhabitant), measures of gender differences (e.g. participation of women to political decision), etc. The double constraint in the ESPON programme as regards the large geographical coverage (29 states) and a precise territorial resolution (NUTS2 or NUTS3) results in withdrawing all interesting indexes of social cohesion, because they are never available simultaneously at regional level for all states of the ESPON area. If we want to develop the research on social cohesion in ESPON, the solution is to develop a 3-step approach

- (1) Start the analysis at national level in order to have a global view**
- (2) Try to obtain regional estimations based on statistical models**
- (3) Realise case studies on states where regional information is available in order to validate the regional estimations**

the dynamic dimension because on a total amount of 103 core indicators, only 2 are related to past evolution and 3 to prognosis on future trends.

This methodology is probably not the most satisfactory as it is based on estimations, but it is often the only possible one. In the next section we explore this track, through an index of health care which is a major topic from a social point of view.

Option 4: Case studies for validation of estimations and in depth analysis (accessibility, etc.)

This option consists in carrying thorough research on the social topics, combining analysis at the macro level with case studies. Such a work can be expected from the next ESPON project on the social dimension (8th round of projects).

3.3.3 Exploration of the social dimension: the case of health indicators

The choice of a health indicator for a preliminary exploration of indicators of social dimension appears especially relevant because there is converging proof that differences in health systems across borders has dramatic social and territorial implications. Two case studies related to recent events (2004 and 2005) are proposed as illustration of the crucial importance of this topic (*Box 1 and Box. 2*)

In the example of Hungarian doctors related by AFP (*Box.1*), we can firstly notice that the brain drain from east to west is produced by a gradient of salaries which is apparently much more important (10 times higher) than the gradient measured by usual criteria of GDP/inh especially if we use the criteria of pps which is the basis for allocation of structural funds. According to the analysis of discontinuities realised in ESPON 3.1, the relatives differences of GDP/inh. observed in 1999 at the border between Austria and Hungary was a ratio of 1 to 5 for GDP/inh. measured in € and a ratio from 1 to 2 for GDP/inh. measured in pps. As these differences are not related to the evolution of GDP/inh. between 1999 and 2005 (which tends rather to a reduction of the differences of GDP/inh. between east and west of EU), **we can suspect that the previous studies based on economic indicators could have underestimate the real level of discontinuities and their social impact.** Another important discovery of the study realised by the Faculty of Medicine of Budapest is the fact that the spatial consequences of social inequalities are not limited to the border area but have implication at a much wider geographical scale. The brain drain of Hungarian doctors toward western Europe start initially from Budapest and western part of the country, but produces in a second step a move of doctors located in less developed regions of eastern Hungary which replace them. And we can assume that in a third step, it produces a move from doctors of Ukraina or Romania toward eastern Hungary, etc. **This demonstrates that the territorial implications of territorial discontinuities are not purely local but produced systemic effects at long distance.**

Box.1: Tempted by higher salaries, Hungarian doctors go west (19/02/2005)

Tempted by salaries more than 10 times higher than at home, Hungarian doctors are emigrating to western Europe, leaving behind understaffed hospitals and a health care system teetering on the edge of bankruptcy. According to a recent survey of the Faculty of Medicine in Budapest, 66 percent of graduates in the European Union's new member said they plan to work abroad while 33 percent said they have already started searching for work in western Europe. Some 430 young doctors have left the country for better paying jobs since Hungary joined the bloc on May 1 of last year, according to Ivan Golub, president of the Union of Hungarian Hospitals. 'If this tendency continues, in a few years we will have to close hospitals because there will be no doctors around to work in them,' Golub said. He said a number of medical school graduates who do stay end up working not as doctors, but for pharmaceutical companies that pay higher wages. The average monthly salary for a Hungarian doctor is 180.000 forint (euros, 970 dollars). In western Europe meanwhile, a doctor can earn up to triple that amount for a single weekend on duty, according to a recent report by the Baranya county Chamber of Doctors in southern Hungary. The report says a number of Hungarian medical graduates, especially anaesthetists, spend weekends working at hospitals abroad, for example in neighbouring Austria, after a hard week's work back home. 'We don't have exact statistics on those who double up with work abroad, but there are many,' said Jozsef Bodis, president of the Baranya county chamber. Others decide to pack up for good. Peter Salltsig, 31, graduated from medical school in Budapest and found a job in Switzerland where he says he earns in one year what he would earn in Hungary in 10 years. 'I come to party to Budapest,' Salltsig said, showing off his brand new sports car. Hungary's western region bordering with Austria is the most affected by the desertion of doctors, leaving understaffed clinics behind them. Anaesthetists are reportedly the most in demand abroad, especially in Austria, Britain and Germany. The job vacancies in Hungary are often filled by ethnic Hungarians who live in poor neighbouring countries, such as Romania, Ukraine or Serbia. Up to one-third of the vacant medical positions in central Hungary are filled with doctors from these countries, MTI national news agency reported earlier this month. It added that many of the newcomers stay only briefly and then also move on to the west in hopes of even higher wages. The cash-strapped Hungarian health care system, meanwhile, is teetering on the edge of bankruptcy. The ruling Socialist-Liberal government has urged the privatisation of hospitals as the recipe for saving the institutions, but it has conceded it does not have enough political support to carry out any major reforms until elections in 2006. A referendum in December urging a ban on privatisation of health institutions failed due to low turnout, but most of those casting ballots said they are opposed to the privatisation of hospitals. Copyright © 2005 AFP.

The example of the border between Czech Republic, German and Poland described by DW World (Box. 2) demonstrate that the brain drain is not limited to the private sector but can also take place in the case of public hospitals. In the eastern part of Germany, German doctors or health workers prefer to leave toward western part of Germany where incomes are higher and are replaced by colleagues from Poland or Czech republic. The motivation of migration is not only personal economical advantage (wages) but also disposal of better conditions of work (equipment of hospitals). The cross border cooperation between hospitals of the region of Zittau can reduce the negative effects of the brain drain, but only if states agree to cooperate and if hospitals agree to take the responsibility of patients from neighbouring countries, which can create problems between national systems of social security.

Box. 2 Doctor across borders between Poland, Czech Republic and Germany (24/02/04)

On May 1, the leaders of the Czech Republic, Germany and Poland will meet near the eastern German town of Zittau to celebrate the expansion of the European Union. Hospitals in the region have already started to look east across the border to deal with an acute shortage of doctors. In Zittau's regional hospital, administrators have long learned to spell the names of their new colleagues correctly. Agata Magdziarek is one of the names that has started to appear frequently on the work schedule. The 28-year-old assistant doctor from Lodz in Poland came to Germany because she couldn't find a job in her home town, where many doctors are unemployed. 'I wanted to work in a hospital with high standards,' she said. 'It was impossible to find that in Lodz.' Like Magdziarek, many eastern European doctors are coming to Germany to work with patients. But before Polish and Czech doctors can come work in Germany, authorities check whether there are Germans available to do the job. As a result, it took six months before the hospital received permission to offer the job to Magdziarek. Young German doctors don't want to come here,' said Gerald Gerlach, a radiologist at the hospital, where every sixth doctor now comes from Poland or the Czech Republic. 'Without these colleagues, we would not be able to staff shifts adequately,' Gerlach said. Eastern European doctors earn as much as their German counterparts -- more than three times as much as they would at home. They also have the opportunity to receive further training to become specialists. According to Magdziarek, German patients have no reservations receiving treatment from her. 'I was worried about that, but it didn't happen,' she said. Besides the border-crossing doctors, hospitals in this region have cooperated in other ways for several years. In 1997, a woman hurt in a motorcycle accident was driven from Bogatynia Poland to Zittau for a computer scan. Hospitals also exchange diagnostic findings and arrange for consultations with specialists. A Czech hospital in Liberec has joined the group. All three are now connected via a digital video line. But after the recent cuts in Germany's health care system, free computer scans to emergency patients from east of the border are something the radiologists in Zittau won't be able to offer any longer. Copyright © DW_World.de: <http://www.dw-world.de/dw/article/0,1564,1122422,00.html>

These two examples are sufficient to emphasize the crucial importance for the ESPON program of a research on statistical indicators of social health at regional level. In a context of rapid increase of the proportion of ageing population, it is a major social challenge to evaluate the inequalities in the allocation of resources in the field of health. And it is also a major problem for economic competitiveness as we can not imagine that a state or a region remains attractive for high skilled workers if the global health system begins to disappear. The quality of the health system is without doubts a core topic for the building of an index of territorial cohesion. But can we measure or at least evaluate it?

3.3.3.1 Modelisation of health expenditures (1996-2000) at state level

Case studies and in-depth analysis of national social systems in a comparative way are certainly the best approach to be developed for a good understanding of the questions discussed above. But such an integrated approach – necessarily realised by specialists of social systems and health - is not possible in the framework of actual project ESPON 3.2 and should certainly deserve an exploratory study during the last years of ESPON 2006, in order to prepare the future research streams of ESPON II. In the framework of project ESPON 3.2 which has to focus on scenario building, the problem is not to measure precisely the phenomena but to obtain a rough quantitative evaluation of the distribution of the allocation of health resource and to use this rough estimation for various simulations of trends which could occur in the future according to opposite extreme assumptions like full privatisation and liberalisation of the health system or, on the contrary, building of a global european system of social security. Such scenario would indeed be very useful for policymakers when they try to evaluate the consequences of political decisions like liberalisation of the market of services (Bolkestein directive).

The most interesting statistical index for a quantitative evaluation of the level of health system is the amount of health expenditure per capita, because it is a global aggregate which is correlated with most important target factors which can not be directly measured (incomes of doctors, level of equipment of hospitals, global access of people to social security, ...). This aggregate can be easily combined with other existing indicators and provide interesting comparisons with GDP/inh, if we compute not only the health expenditure per capita but also the share of health expenditure in GDP which is a very important output of political decision.

The amount of health expenditures is not available at regional level in Eurostat databases⁹⁰ but national level data can be easily obtained for most states of the world since 1990 through the World Development Indicator. As this indicator can be subject to important variations from one year to another, we have decided (as suggested by project 3.4.1 Europe in the World) to compute the mean value on five years for the period 1996-2000 in order to have more robust results. In order to have a better view of the situation of ESPON countries, we have also decided to examine in a first step the distribution of health expenditure for all countries located in ESPON and its neighbourhood, according to the template of a European neighbourhood proposed by project ESPON 3.4.1

This *Figure 1* demonstrates the existence of a positive relation between the level of health expenditure and the GDP/inh. of countries: the poorest countries of the ESPON neighbourhood (less than 1000 \$/inh.) allocate generally a very limited share of their GDP to health expenditure (less than 5%) ; reversely, the richest countries of western Europe allocate generally more than 7% of their GDP to health expenditure and eventually more than 10% (Germany, Switzerland). This non-linear relation (best fit obtained by a power function) is statistically very significant, but its explanation is complex and is related to many factors like demographic transition. The latter took place earlier in more developed countries and has induced a highest percentage of old people producing high levels of health care demand. GDP explains only 31% of the variation of the level of health expenditure and the analysis of residuals indicates that many other factors (political, social, historical, cultural) can produce important variations, all things being equal with GDP/inh.

⁹⁰ Although Eurostat provides regional data on doctors and hospital beds as can be seen in the Regional Statistical Yearbook 2004. These data will be used in the next phase to calibrate the model results.

This analysis at state level indicates clearly that health expenditure is much more than a simple consequence of the level of economic development and can provide much more information about the unequal repartition of wealth between inhabitants and the existence of social infrastructure or social rights. As a typical example, we can compare the former socialist countries of Europe and the Persian Gulf countries. The former socialist countries are generally located above the curve of the global relation because their expenses of health are greater than expected according to their GDP: this situation is explained by the development of strong health infrastructure and relative parity to health care during the socialist period, which has not yet been removed by liberalisation. On the contrary, countries from the Persian Gulf are characterised by negative residuals which means that health expenses are lower than expected: this situation can be easily explained by the maximum concentration of incomes by a minority of privileged people and the existence of a large group of immigrated workers with minimum social coverage and rights⁹¹.

The reduction of the correlation analysis to the 29 states of the ESPON area (Figure 2 and Table 1) demonstrates that the previous relation remains available at this scale with more or less the same parameters but a better fit, from the analysis. But one more time, the relation appears to be complex and the amount of health expenditures can not be obtained by a simple mathematic transformation of GDP/inh. Using the best statistical model (power function) the level of GDP/inh explains only half (51%) of the differences in allocation of health expenditure and two-thirds (63%) if we removed the particular case of Luxembourg⁹². Even if this model is not perfect, it provides an interesting information on the fact that Health expenditure per inhabitant (Y) are not proportional to GDP/inh. (X) but grows faster according to a parameter α established in the non-linear relation.

⁹¹ A complementary explanation of this differences is related to the demographic structure of population. Countries with ageing population are more likely to have important share of health expenditure in their GDP that countries with young population.

⁹² The fact to remove Luxembourg from the correlation analysis is justified by its situation of 'statistical outlier'. But it is also justified by the empirical situation of a state where an important part of the GDP is produced by workers which live in foreign countries and do not contribute to an increase of the Health expense of Luxembourg. If we had included the expense of social security payed by France, Belgium of Germany for people working in Luxembourg, the situation of outlier of Luxembourg would certainly disappear.

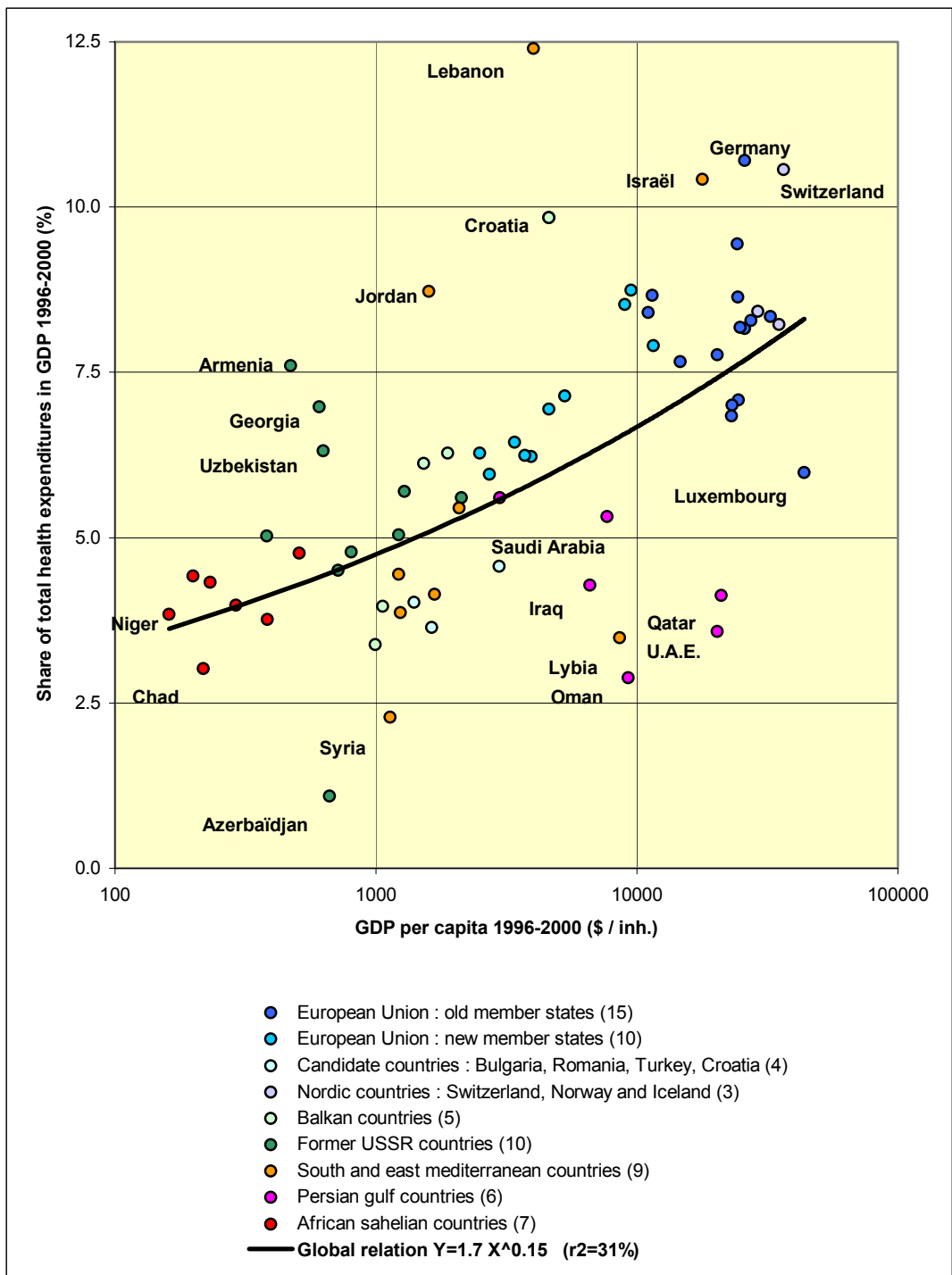


Figure 61 Health Expenditures and GDP 1996-2000 in EU and neighbouring countries

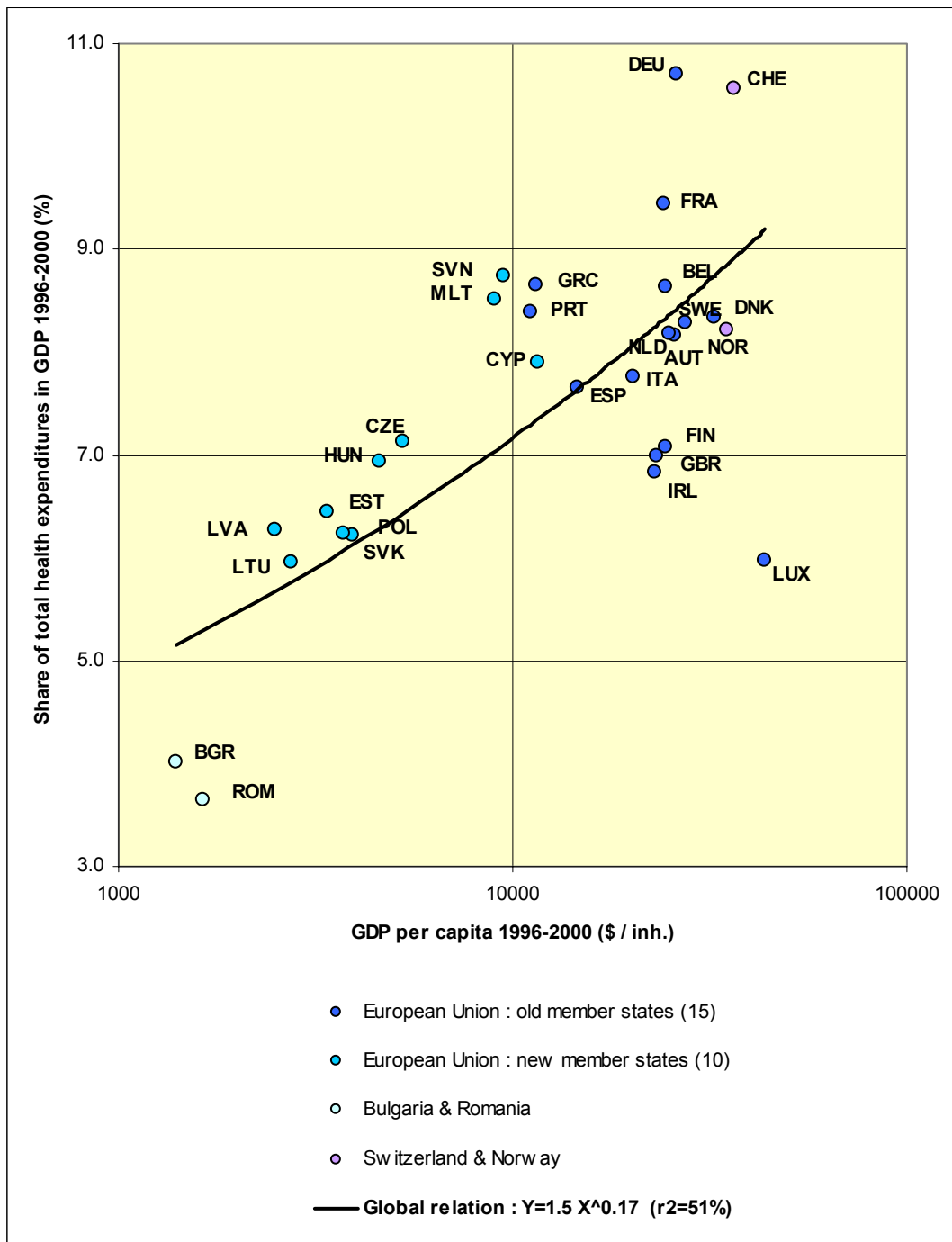


Figure 62 Health Expenditure 1996-2000 in the 29 ESPON countries

| State | Population | | GDP | | Health Expend. | | Health per inh. | | Health / GDP | |
|------------------------------|---------------|--------------|----------------|--------------|----------------|--------------|-----------------|------------|--------------|------------|
| | x 1000 | % EU25 | Mio.\$ | % EU25 | Mio.\$ | %EU25 | \$ | EU=100 | share | EU=100 |
| Old Memb. St. (EU15) | 374445 | 83.3% | 8378256 | 96.3% | 732317 | 97.1% | 1956 | 117 | 8.7% | 101 |
| AUT Austria | 8083 | 1.8% | 209155 | 2.4% | 17067 | 2.3% | 2112 | 126 | 8.2% | 94 |
| BEL Belgium | 10204 | 2.3% | 248623 | 2.9% | 21481 | 2.8% | 2105 | 125 | 8.6% | 100 |
| DNK Denmark | 5301 | 1.2% | 172437 | 2.0% | 14381 | 1.9% | 2713 | 162 | 8.3% | 96 |
| FIN Finland | 5151 | 1.1% | 125995 | 1.4% | 8920 | 1.2% | 1732 | 103 | 7.1% | 82 |
| FRA France | 58429 | 13.0% | 1417027 | 16.3% | 133767 | 17.7% | 2289 | 136 | 9.4% | 109 |
| DEU Germany | 82065 | 18.3% | 2126184 | 24.4% | 227502 | 30.2% | 2772 | 165 | 10.7% | 123 |
| GRC Greece | 10517 | 2.3% | 120715 | 1.4% | 10454 | 1.4% | 994 | 59 | 8.7% | 100 |
| IRL Ireland | 3712 | 0.8% | 85528 | 1.0% | 5850 | 0.8% | 1576 | 94 | 6.8% | 79 |
| ITA Italy | 57565 | 12.8% | 1168815 | 13.4% | 90700 | 12.0% | 1576 | 94 | 7.8% | 90 |
| LUX Luxembourg | 427 | 0.1% | 18646 | 0.2% | 1115 | 0.1% | 2613 | 156 | 6.0% | 69 |
| NLD Netherlands | 15709 | 3.5% | 390502 | 4.5% | 31943 | 4.2% | 2033 | 121 | 8.2% | 94 |
| PRT Portugal | 9968 | 2.2% | 110265 | 1.3% | 9262 | 1.2% | 929 | 55 | 8.4% | 97 |
| ESP Spain | 39928 | 8.9% | 585678 | 6.7% | 44863 | 5.9% | 1124 | 67 | 7.7% | 88 |
| SWE Sweden | 8854 | 2.0% | 242419 | 2.8% | 20072 | 2.7% | 2267 | 135 | 8.3% | 96 |
| GBR United Kingdom | 58532 | 13.0% | 1356266 | 15.6% | 94939 | 12.6% | 1622 | 97 | 7.0% | 81 |
| New Memb. St. (EU10) | 74949 | 16.7% | 325049 | 3.7% | 21750 | 2.9% | 290 | 17 | 6.7% | 77 |
| CYP Cyprus | 748 | 0.2% | 8659 | 0.1% | 684 | 0.1% | 914 | 54 | 7.9% | 91 |
| CZE Czech Republic | 10294 | 2.3% | 54469 | 0.6% | 3889 | 0.5% | 378 | 23 | 7.1% | 82 |
| EST Estonia | 1389 | 0.3% | 4716 | 0.1% | 304 | 0.0% | 219 | 13 | 6.4% | 74 |
| HUN Hungary | 10130 | 2.3% | 46711 | 0.5% | 3242 | 0.4% | 320 | 19 | 6.9% | 80 |
| LVA Latvia | 2423 | 0.5% | 6057 | 0.1% | 380 | 0.1% | 157 | 9 | 6.3% | 72 |
| LTU Lithuania | 3555 | 0.8% | 9712 | 0.1% | 579 | 0.1% | 163 | 10 | 6.0% | 69 |
| MLT Malta | 385 | 0.1% | 3469 | 0.0% | 296 | 0.0% | 767 | 46 | 8.5% | 98 |
| POL Poland | 38648 | 8.6% | 152231 | 1.7% | 9469 | 1.3% | 245 | 15 | 6.2% | 72 |
| SVK Slovak Republic | 5389 | 1.2% | 20121 | 0.2% | 1256 | 0.2% | 233 | 14 | 6.2% | 72 |
| SVN Slovenia | 1987 | 0.4% | 18904 | 0.2% | 1652 | 0.2% | 832 | 50 | 8.7% | 101 |
| European Union (EU) | 449394 | 100% | 8703304 | 100% | 754067 | 100% | 1678 | 100 | 8.7% | 100 |
| Cand. Countries (CC) | 100339 | - | 262302 | - | 12636 | - | 126 | 8 | 4.8% | 56 |
| BGR Bulgaria | 8252 | - | 11577 | - | 465 | - | 56 | 3 | 4.0% | 46 |
| ROM Romania | 22512 | - | 36860 | - | 1342 | - | 60 | 4 | 3.6% | 42 |
| TUR Turkey* | 65152 | - | 193455 | - | 8822 | - | 135 | 8 | 4.6% | 53 |
| HRV Croatia* | 4425 | - | 20411 | - | 2007 | - | 454 | 27 | 9.8% | 113 |
| Assoc. Countries (AC) | 11552 | - | 415670 | - | 40262 | - | 3485 | 208 | 9.7% | 112 |
| NOR Norway | 4434 | - | 155241 | - | 12761 | - | 2878 | 172 | 8.2% | 95 |
| CHE Switzerland | 7118 | - | 260428 | - | 27501 | - | 3863 | 230 | 10.6% | 122 |
| Other aggregates | | | | | | | | | | |
| EU15+AC | 385997 | - | 8793925 | - | 772579 | - | 2002 | 119 | 8.8% | 101 |
| EU25+AC | 460946 | - | 9118974 | - | 794329 | - | 1723 | 103 | 8.7% | 101 |
| ESPON 29 | 519935 | - | 8916880 | - | 764144 | - | 1470 | 88 | 8.6% | 99 |
| EU25+CC | 549734 | - | 8965606 | - | 766703 | - | 1395 | 83 | 8.6% | 99 |
| UE25+AC+CC | 561286 | - | 9381276 | - | 806965 | - | 1438 | 86 | 8.6% | 99 |

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Source: WDI 2003. REGIO. ESPON Database.

* Turkey and Croatia are official candidate country but non ESPON

Table 28 Health Expenditure 1996-2000 at state level

3.3.3.2 Theoretical model relating health expenditure and GDP

The empirical relation which has been observed in previous at state level can be formalised from mathematical point as equation (1) in linear form or equation (2) in non linear form

$$\log\left(\frac{W_{Health_region}}{W_{Tot_region}}\right) = \log(k) + \alpha \cdot \log\left(\frac{W_{Tot_region}}{P_{Tot_region}}\right) \quad (1)$$

$$\left(\frac{W_{Health_region}}{W_{Tot_region}}\right) = k \cdot \left(\frac{W_{Tot_region}}{P_{Tot_region}}\right)^\alpha \quad (2)$$

It is easy to demonstrate that this power relation between the share of health expenditure in GDP (W_{Health}/W_{Tot}) and the GDP per inhabitant (W_{Tot}/P_{Tot}) is equivalent to another relation linking health expenditure per inhabitant (W_{Health}/P_{Tot}) and GDP per inhabitant. After elementary transformation, the equation (2) can indeed be written as:

$$\left(\frac{W_{Health_region}}{P_{Tot_region}}\right) = \lambda \cdot \left(\frac{W_{Health_state}}{P_{Tot_State}}\right) \cdot \left(\frac{W_{Tot_region}}{P_{Tot_region}}\right)^{1+\alpha} \quad (3)$$

The parameter k is transformed into a product between the national mean of health expenditure per inhabitant and a constraint parameter λ which insure the conservation of the total sum of funds allocated at regional level according to the value of α .

The interest of this transformation is the fact that equation (3) can be interpreted as a measure of increase or decrease of economic inequalities related to the social redistribution realised by the health system. For a given spatial system (S) divided in territorial units (T) = $\{T1...Ti...Tn\}$, the value of the parameter $\beta = (1+\alpha)$ can be interpreted as a measure of convergence or divergence of social levels related to the system of allocation of health expenditures. The critical values of the convergence parameter β are 0 and 1 which define two theoretical models of allocation of health expenditures to territorial units:

- **$\beta=0$ ($\alpha=-1$) defines the reference model of social justice** where the allocation of health expenditure is proportional to population and where all territorial units have the same level of health expenditure per capita (the national mean).
- **$\beta=1$ ($\alpha=0$) defines the reference model of economic proportionality** where the allocation of health expenditure is proportional to GDP and where all territorial units allocate the same share of GDP to health expenditures.

With $\beta < 0$, the level of health expenditure per capita is more important in territorial units with low level of GDP/inh. than in territorial units with high level of GDP/inh, which means that health expenditure contribute to the reduction of regional inequalities. With $\beta > 0$ we observe the contrary effect which means that health expenditures contributes to the increase of regional variations of GDP/inh.

With $\beta < 1$, the level of health expenditure per capita is proportionally lower than the level of GDP/inh which means that health expenditure introduce less variations between territorial units that other components of GDP. With $\beta > 1$, the contrary is true and health expenditure introduce more variations between territorial units than other components of GDP.

We can summarise this theoretical considerations by a simple table which give the interpretation of the empirical values of β (or α) according to our two reference models:

| | | | |
|----------------------------|-------------------|-----------------------|---|
| $\beta < 0$ 1 | \Leftrightarrow | $\alpha < -$ | <i>Health expenditures reduce the variations of GDP/inh. between regions.</i> |
| $0 \leq \beta \leq 1$ 0 | \Leftrightarrow | $-1 \leq \alpha \leq$ | <i>Health expenditures increase the variation of GDP/inh. between regions but less than other components of GDP</i> |
| $\beta > 1$ 0 | \Leftrightarrow | $\alpha >$ | <i>Health expenditures increase the variation of GDP/inh. between regions and more than other components of GDP</i> |

We have seen previously that the application of this model to a pan-European area and to the ESPON area divided into states provides an empirical value α which is comprised between +0.15 and +0.20 which means that, at international level, $\beta > 1$ and thus health expenditures contribute to increase the heterogeneity of GDP/inh. between states. This is an important result but, from an ESPON point of view, it would be much more interesting to obtain an equivalent estimation of the effect of health expenditure on social territorial disparities at regional level. In practical terms we have information on inter-national variation which indicates without doubts that the territorial discontinuities along national border are certainly higher for health expenditures per capita criteria than for global GDP/inh. But we are not in a situation to evaluate the intra-national variation between regions of the same state because we ignore the value of the national parameters $\beta_1 \dots \beta_{29}$ which could provide a relevant estimation of regional allocation of health expenditure in each of the 29 states of the ESPON area at NUTS 2 or NUTS 3 levels. Without further empirical investigations (case studies on health expenditures in various states of the ESPON area) we can only use theoretical assumptions for the evaluation of health expenditure per capita at regional level. 3 models are proposed:

- **Model 1: national welfare state ($\beta_1 = \beta_2 = \dots = \beta_{29} = 0$)** could assume that each state allocates health expenditures proportionally to the number of inhabitants of each region which means that they are no intra-national variations and that all territorial discontinuities would take place along the international boundaries (*Map 1*)
- **Model 2: national market regulation ($\beta_1 = \beta_2 = \dots = \beta_{29} = 1$)** could assume that inside each state, the level of health expenditures introduces exactly the same level of regional inequalities than other economic factors. In this case, the regional disparities of Health expenditure per capita are strictly equivalent to the disparities observed for the criteria of PIB per capita for regions located in a same state, but not necessary for regions of different states because the share of GDP allocated to health expenditure is different from one state to another. (*Map 2*)
- **Model 3: fractal distribution of inequalities ($\beta_{\text{International}} = \beta_1 = \beta_2 = \dots = \beta_{29} \approx 1.17$)** could finally assume that the empirical rule which has been observed at international level remains valid at intranational level, which means that the parameter that has been empirically established at state level can be transposed at regional level and is the same for all states of the ESPON area. In this case, health expenditure will increase the discontinuities of GDP/inh. not only between regions of different states but also between regions of the same state (*Map 3*)

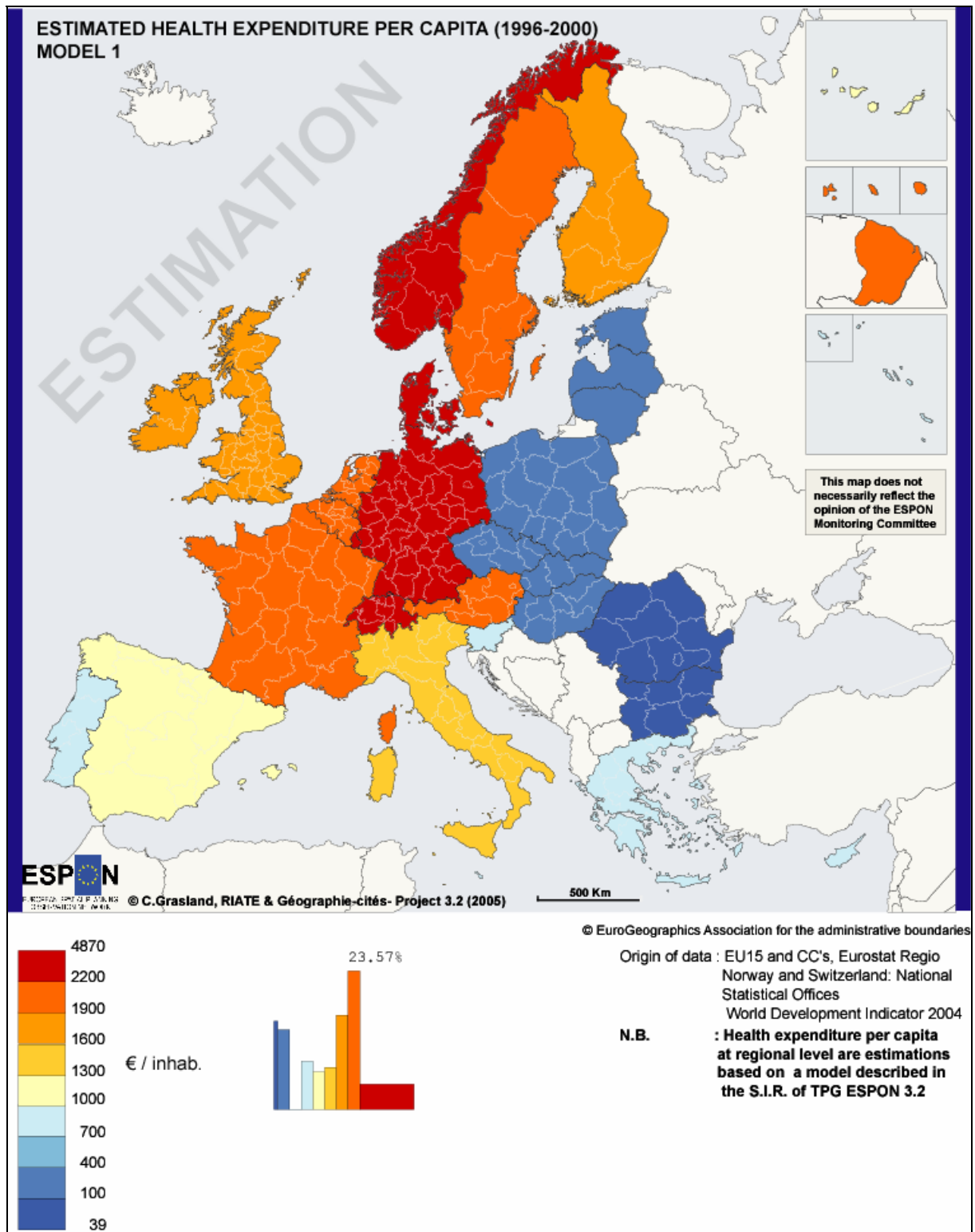


Figure 63 Estimated Health Expenditure per capita (1996-2000) at regional level according to model 1

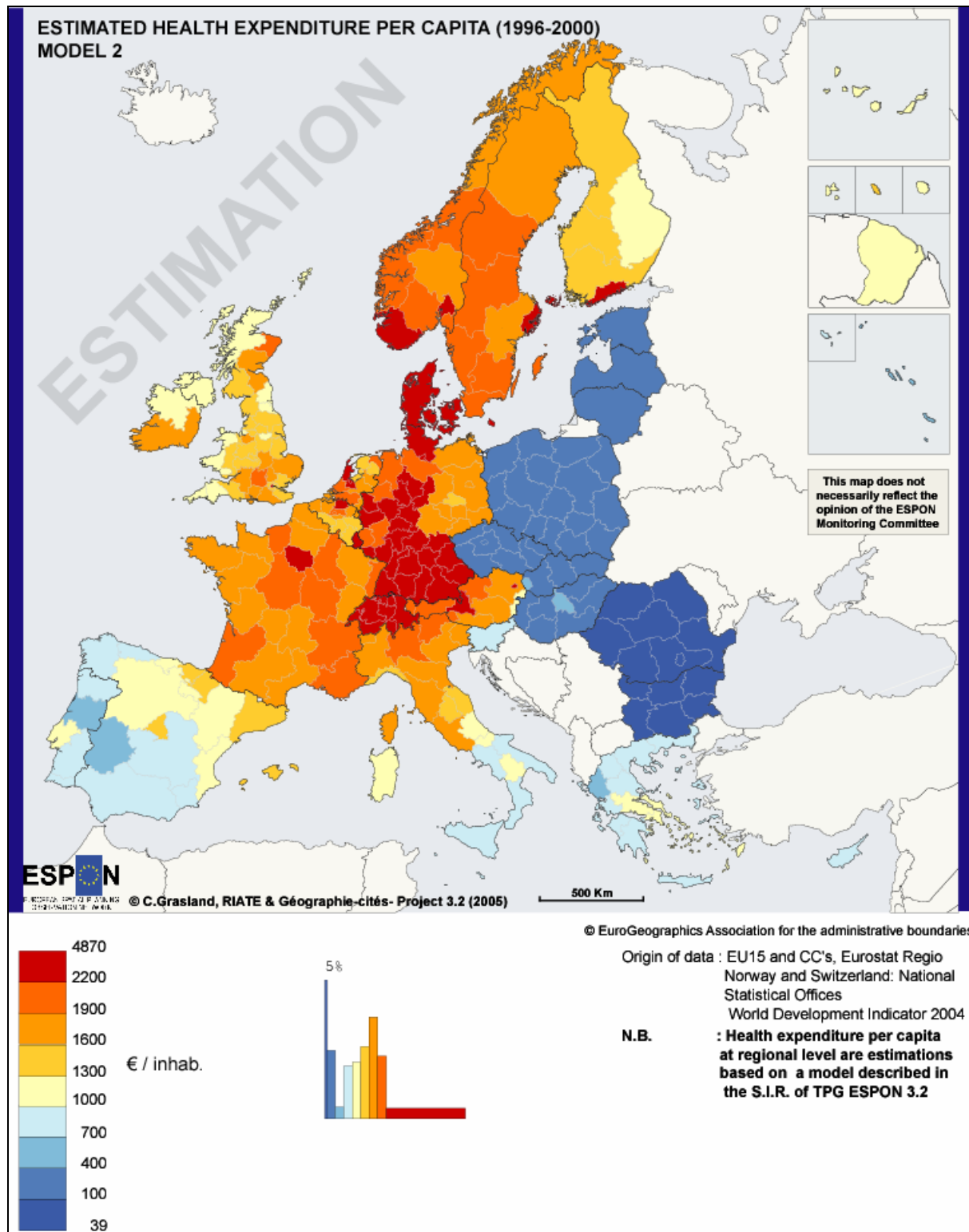


Figure 64 Estimated Health Expenditure per capita (1996-2000) at regional level according to model 2

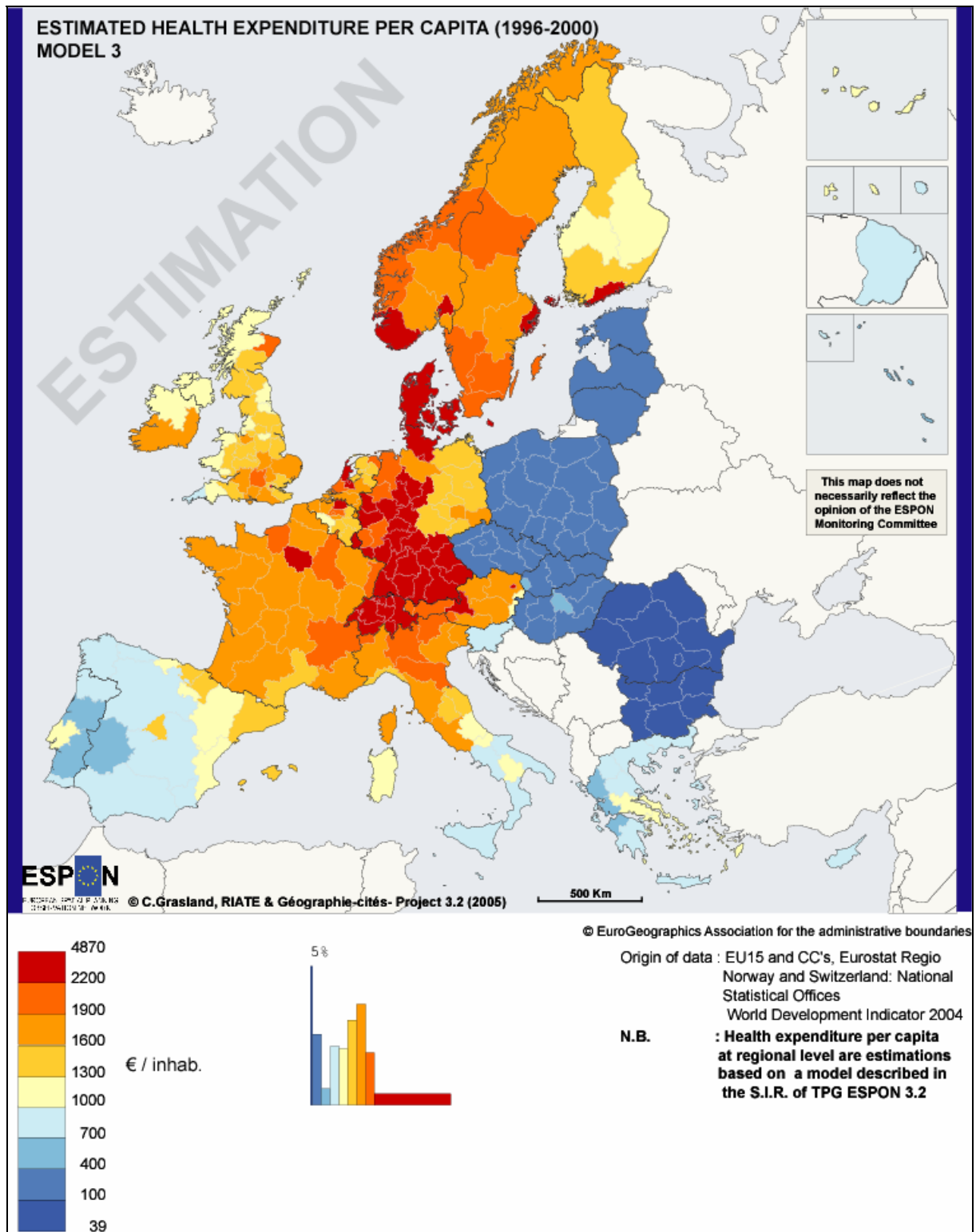


Figure 65 Estimated Health Expenditure per capita (1996-2000) at regional level according to model 3

3.3.3.3 Comparison of regional disparities for GDP/inh and estimated health expenditure

According to classical statistical criteria of regional variation (*Table 2*) the distribution of health expenditure per inhabitant seems to introduce a more important level of regional disparities than the GDP per inhabitant in euros, except in the case of perfect allocation of health expenditure according to population. It means that the social disparities measured by health expenditure between region are minimum equal to economic disparities (coefficient of variation =56% according to model 1) and are probably higher (CV=63 or 66% according to model 2 and model 3). This increase of disparities for social criteria is the consequence of the fact that the level of health expenditures increases generally with the level of economic development. Therefore, redistribution which takes place at national (instead of the European) level tends to increase and not to reduce regional inequalities at European level⁹³.

| Variable | Min | Q1 | Med | Q3 | Max | Asymmetry | C.V. |
|--------------------------|-----|------|-------|-------|-------|-----------|------|
| GDP / inh. (1999) | 6.4 | 61.6 | 110.6 | 133.2 | 312.6 | 0.20 | 56% |
| Health Exp / inh (Mod.1) | 3.5 | 63.3 | 105.2 | 138.5 | 234.3 | -0.25 | 56% |
| Health Exp / inh (Mod.2) | 2.7 | 57.1 | 107.2 | 131.0 | 297.5 | 0.35 | 63% |
| Health Exp / inh (Mod.3) | 2.6 | 54.5 | 102.7 | 134.5 | 312.6 | 0.56 | 66% |

Notes: All variables are transformed into index 100 = mean value of ESPON 29 and all statistical parameters are weighted by the population or regions.

Table 29 Statistical parameters of regional distribution of GDP/inh. (1999) and estimated health expenditure per inhabitant (1996-2000)

This increase of statistical differences has important consequences from territorial point of view because it has necessary consequences in terms of local differences between neighbouring regions, especially along the border between old and new member countries. To explore this consequence, we have realised comparative maps of territorial discontinuities for GDP/inh and estimated health expenditure per capita according to model 3. Both criteria have been transformed to index 100 = ESPON 29 and discontinuities are measured in relative terms (ratio) in order to insure better comparability. Statistical box plots have been added in order to visualize more easily the regional differences inside each state (*Map. 4 and Map 5*).

At first glance, the map of spatial regional disparities for health expenditure per capita (*Map 4*) looks similar to the map established for GDP/inh. in TPG ESPON 3.1., but some important differences can be pointed, and especially in the case of the United Kingdom, Ireland or Finland where the level of health expenditures per capita is under European mean in a high number of region. This can be explained by the fact that these countries allocate a relative low share of their GDP to health expenditure in 1996-2000 (6.8 to 7.1%) , as compared to the other states of western Europe (7.7 to 10.7%). All regions of new member countries and accessing countries present very low level of health expenditure per inhabitant because, except in the cases of Slovenia, Malta and Cyprus. they present at the same time a low level of GDP/inh. and a low share of GDP allocated to health expenditure (6.0 to 7.1%).

⁹³ This result would be trivial if we had applied the same mathematical formula for the transformation of GDP/inh. into Health expenditure per capita for all European regions. But it is not the case because the estimation of the region depends not only from the parameter α but also from the 29 different national parameter of % of health expenditure in GDP.

The most remarkable result of the comparison is the strong increase of the intensity of the territorial discontinuity between old and new member countries: the relative differences between regions located on both side of the former border of UE15 are generally a ratio higher than 1 to 5 for the criteria of health expenditure when they are 'only' a ratio from 2 to 4 for the criteria of GDP/inh. This reflects the assumption in model 3 that differences in terms of social well-being are probably much greater than differences in terms of economic level, which is consistent with empirical observations presented in the beginning of this section (case of Hungarian doctors, *Box 1*).

This very strong territorial diversity can have many social consequences at local level, like the important emigration of health practitioners from east to west and more generally the intensification of 'brain drain'. It can also be noticed that strong discontinuities of health expenditures could also be very important inside former UE15, like for example between Germany and Benelux, Switzerland and France, France and Spain... In the eastern part, we can also observe a very strong discontinuity between Hungary and Romania. Generally, border effects seem to be much more important on this health criteria than for GDP/inh. because social systems can change dramatically across the borders. But we can also notice that, in a few particular cases, the discontinuity related to health expenditure is equivalent to discontinuity of GDP (Italia/Slovenia) and even lower (borders of Luxembourg).

The existence of strong social or economic discontinuities between regions is a major problem in term of territorial cohesion and is something that can not be directly observed by classical statistical or economic indicators of regional disparities, as demonstrated in the Figure below.

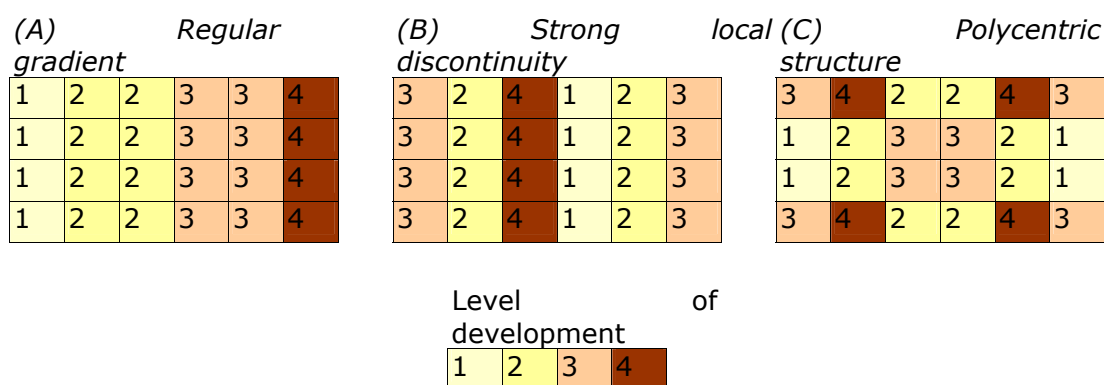


Figure 66 Theoretical consequences of regional disparities

In the three theoretical situations presented in Figure 1, we have the same statistical distributions of regional inequalities with 4 regions at level 1, 8 regions at level 2, 8 regions at level 3 and 4 regions at level 4. Accordingly, each economic index of disparity (Coefficient of variation, Gini index, entropy...) will consider the three situation as equivalent. Or, the spatial configuration (i.e. the relative position of regions with different level of development) is of great consequence from social and economic point of view:

- **The situation of regular gradient (type A)** introduces a low level of disparities at local level (maximum difference between contiguous regions equal to 1 but make possible the existence of migrations at long distance between regions of different level. Typically, we can expect opposite flows of labour force and invests between regions located at each extremity of the area.
- **The situation of strong local discontinuity (type B)** introduces a very strong local level of differences along a line (contact between less and more developed regions) which implies very

strong local perturbations. But, at the same time, they are no important differences at long distance which means that the flows will not modify the global equilibrium of the spatial system.

- **The situation of polycentric structure (type C)** is a mixture of both previous situation with combination of gradient and medium local discontinuities. The interest of this situation is that potential flows of regulation (migration of labour force and invests) will take place at medium distance and will take different directions, according to the existence of different poles of high development level. Whatever the sign of β convergence (positive or negative), individuals located in less developed regions will have good accessibility to regions of higher development.

If we compare this theoretical model to actual situation of economic and social development, we can be pessimistic because the spatial structure observed in *Map 4* and *Map 5* is a combination of strong gradient between old and new member countries (type A) and very strong local discontinuity along the former iron curtain (type B).

This first attempt of assessing health expenditures at regional level will be strengthened in the next months by further analyses at the regional/ local level, in order to combine them with the question of accessibility to essential services, central in the concept of *territorial cohesion*. This is an ongoing work, whose relevance and potentialities will be checked in the next steps of work. In the current state of the ESPON database, lacking truly social indicators, such an attempt was the only possible way going forward in the ETCI work. If this attempt is validated, further versions of the composite index can be proposed in the future, allowing the visualisation of scenarios as regards territorial cohesion.

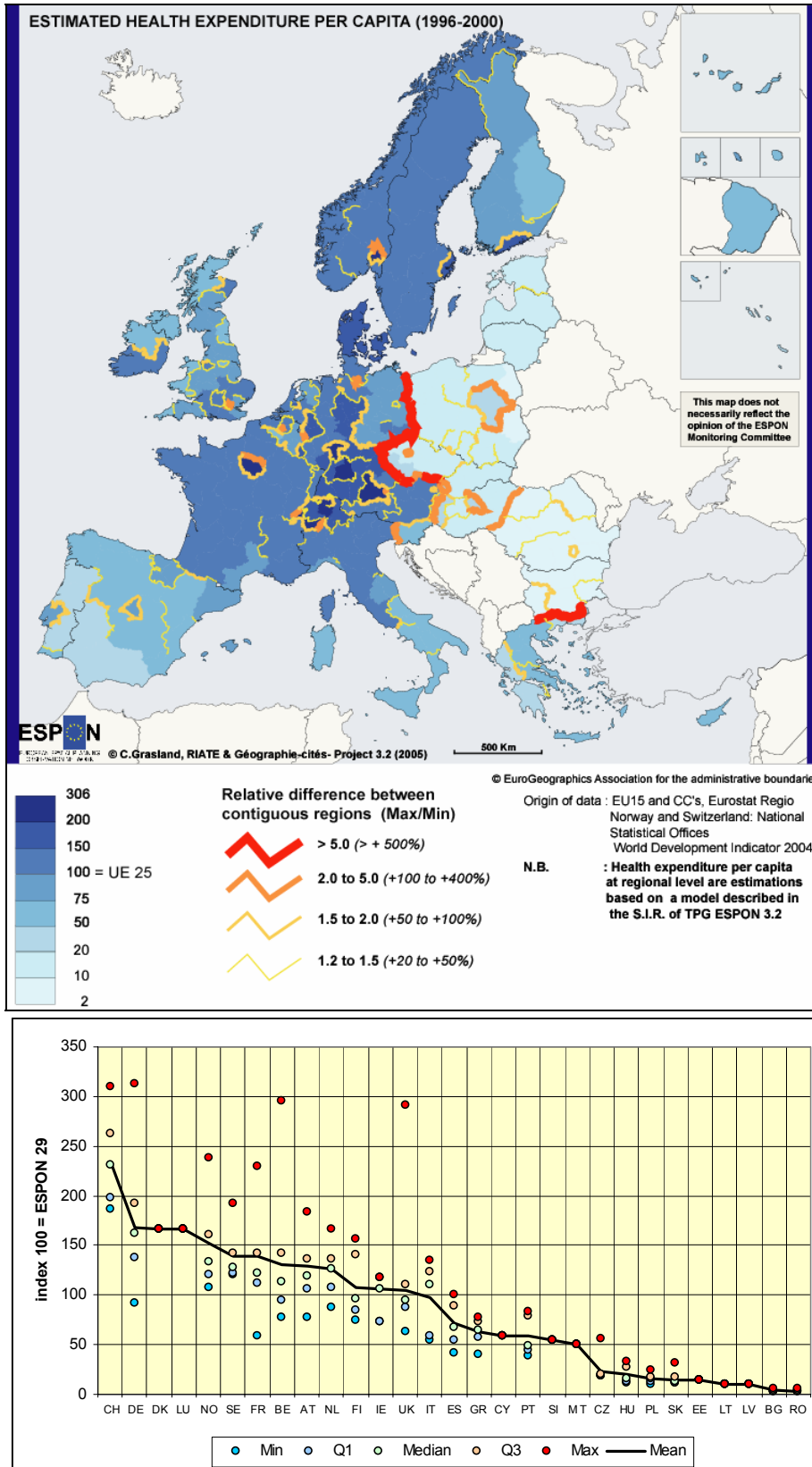


Figure 67 Spatial heterogeneity for Health Expenditure per capita 1996-2000 (Model 3)

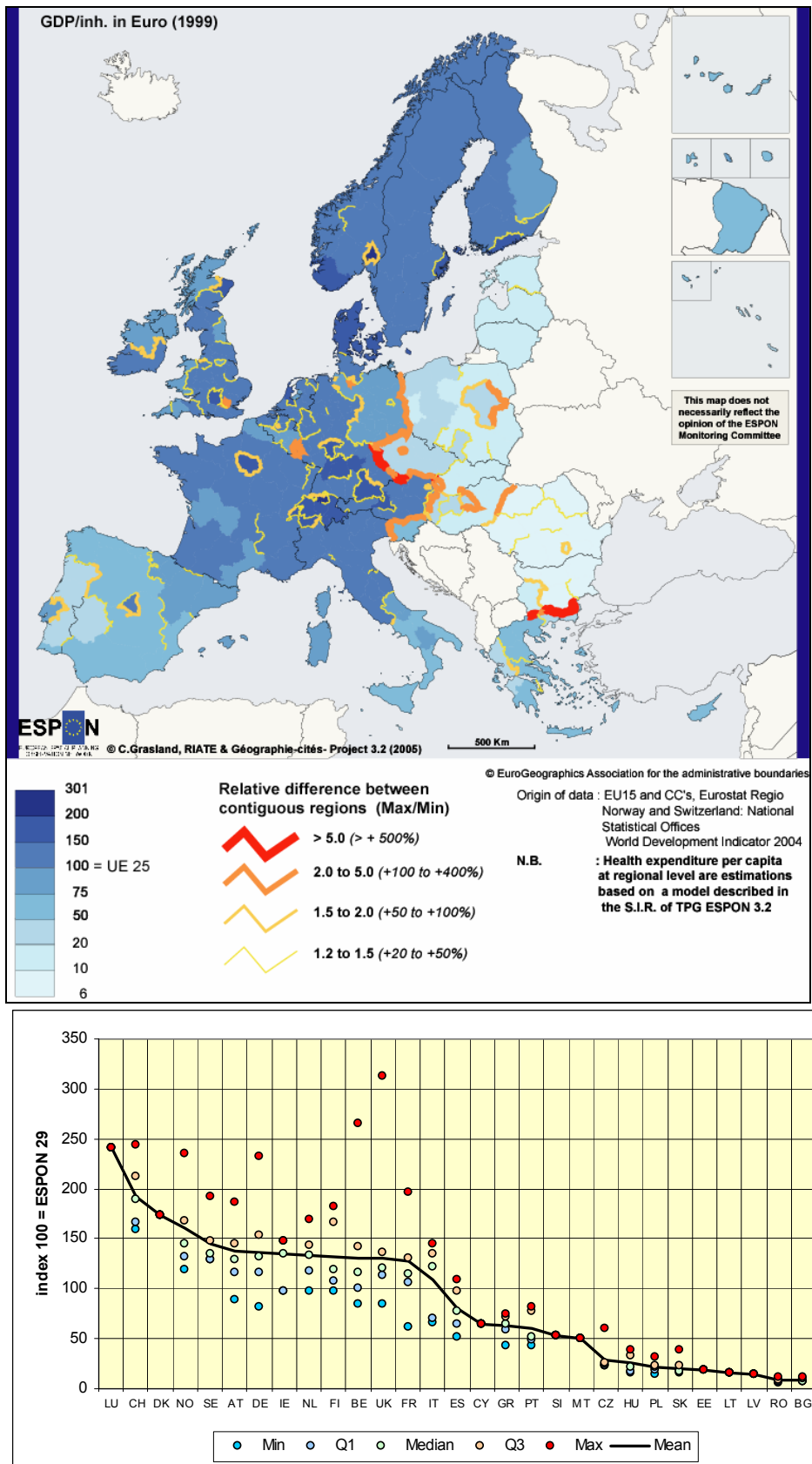


Figure 68 Spatial heterogeneity for GDP/inh. in euros (1999)

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3.4 Long-term database

According to the terms of reference and the timetable, the main output of the work package 'Long term database' for the SIR of project ESPON 3.2 is the presentation of the data model which will be used for data collection during the year 2005, in order to obtain first maps of long term series on basic indicators which will be presented in the TIR and which will provide important inputs for the quantitative validation of the scenarios.

But it is also important to have a presentation of the indicators which will be collected during the next month the maps which can be derived. Therefore, we have introduced a short presentation of the objective of data collection and some preliminary cartographic results.

3.4.1 Modelisation of long term database

3.4.1.1 Modelling and Harmonising Spatiotemporal Data - objectives and structure

The definition of the objectives attached to this modelling and this harmonization of long-term data, raises a certain number of problems which we can be summarized in the following way:

- We thus have heterogeneous databases, which contain information of different nature (statistics, space...), and possibly rely on different models (relational, object, etc.)
- These heterogeneous sources are necessary to answer the various problems of the European policies.
- We do not aim to replicate acquisitions of information but dispose of a unifying model which allows us to re-use what exists and to free ourselves from the heterogeneity of the sources, and especially, to bring an added value in the exploitation of these sources:
 - in the support that this model offers to manage in a coherent way the three-dimensional (set of themes, space and temporal) and especially evolutionary (very related to temporal dimension) character of information
 - in the capacity which it has to integrate data from different sources to give a more complete representation than what would be possible with only one data base source
 - in the mechanisms than it offers to manage the fact that missing data can be estimated, that corrections can be made if need be, etc.

Essential information for the ESPON programme (in general) and for the construction of policy scenarios (in particular) can be described as a set of coherent databases in which three following dimensions are more or less developed:

- a thematic dimension characterized by the diversity of the indicators describing the geographical units.
- a spatial dimension offering a diversity of spatial resolutions and levels of observation.
- a temporal dimension expressing itself through a more or less high temporal resolution.

In general, databases are conceived and developed by privileging one of the dimensions from others. The major disadvantage lies in the fact that a complete and coherent vision of a phenomenon according to the three quoted dimensions is difficult to obtain.

Consequently, a multidimensional approach, taking into account these three joint dimensions, is a crucial challenge for the ESPON programme: the elaboration of diverse analyses and scenarios on territorial development supposes indeed a high level of quality precisely in each of the three dimensions. The goal of this study is to find a solution to answer these constraints and to test it, to improve the exploitation of the existing databases. The suggested solution concerns first a modelling activity to define a data model rendering these thematic dimensions, space and temporal, guaranteeing their coherence and making it possible to integrate information resulting from existing databases. In the second time, an implementation of this model in a form of concrete database will be considered.

3.4.1.2 General principles

The suggested approach consists in defining a model in order to meet the integration of databases of heterogeneous socio-economic indicators, by stressing the multidimensional character of the information. This model aims at harmonising data resulting from various sources. Then, it will be used for the implementation of a single database where data will be coherent with three identified dimensions: thematic, spatial and temporal. This model and, later on, the implemented database would permit to represent useful information for the ESPON programme (development of scenarios for example).

At the end the objective is to have a tool for retrieving spatiotemporal data (socio-economic indicators). This tool will first be simply made of the developed database which can be exploited with the language of interrogation (probably SQL) provided by the System of databases Management in which it will be implemented. This language will have to be wide in order to carry out the clarification of requests, the checking of coherence, etc, which become essential tasks to answer correctly to a multidimensional request.

Possibly, a developed cartographic interface of interrogation on top of this database could be proposed to facilitate the elaboration of requests by the user. However, this interface is not one of the ESPON 3.2 deliverables.

The contents of the database will be progressive and will take into account:

- the trace of basic information and its genealogy: metadata on each stored indicator will give its source (the original database), and for each original database we will also have various information related to it (statistical institute, confidence in it, validation of the database by European organizations, etc.)
- estimation methods will be used to fill the information gap and imprecisions: they will be stored in the database, and, for each type of indicator, estimation strategies will be recommended to the user, but the latter remains free in his choices.

Three assumptions underlie the use of the model and in particular the application of the interpolation processes:

- starting point is represented by the distributions (simple indicators) in year 2000, at a State level,
- temporal series will be also developed at a State level for a given period,
- the regional distributions will be appreciated in each official State division.

Modelling will be carried out in a language that allows three dimensions and the enhancement of the harmonized databases will be done by open-source software.

At this level, we suppose that integration of initial study data is possible: we will then lay out the database which implements the model of all the socio-economic indicators of the study. This database, possibly distributed, will be built from only one DBMS (for example PostgreSQL or MySQL). In this three-dimensional context (thematic, spatial and temporal) the awaited requests will be of that kind: 'give the estimated population in 2005 in the defined contours of the EEC in 1984'. This kind of complex request highlights a certain number of ambiguities and inconsistencies which need to be taken into account in the development of the model. For each component of the system impacted by the request, we draw below a list of the potential problems to which the model and its implementation will have to answer.

The structure of the request takes again the three-dimensional description of our database, to formulate a request (i.e. to specify what is exactly the information we seek in our database). Also, for each dimension, expectations will have to be specified:

- theme of reference (the indicator which we are interested in)
- space of reference (the spatial contours and resolution which we are interested in)
- time of reference (moment or temporal interval of reference).

3.4.1.3 Space of reference

It is necessary to make the difference between spatial reference and problems of geographical identity of units.

1. The problem of the Geographical Unit identity is a conceptual choice we have to do before going further on our model. It will belong to our ontology of the places (vision of the world), either a Geographical Unit is defined as indissociable from its name, or we will say that the identity of Geographical Unit depends on other factors. Considering Geographical Units as remaining the same after changing name is probably more in accordance with historical reality and the user expectations;
2. To specify the space of reference, two possibilities can be considered:
 - a. either by directly entering the coordinates of the data (heavy but operative system)
 - b. or by indicating the spatial influence of a Geographical Unit at a certain historical moment (even a Geographical Unit or an aggregation of a Geographical Unit).
In this second case, with the name of the Geographical Unit and the historical moment, we are able to precisely identify the spatial scope of reference. If at a certain point, we do not have a Geographical Unit associated to this name, then the difficulty of the identity arises. It is thus necessary to try and identify the Geographical Unit which fits the best to the required data, and to refer to its spatial scope.

By default, (when no precision is given on the type of space in which the projected indicator is to be restored), the space of reference could be 2000 ('space of reference'): that would allow having a clearly defined spatial reference ('States in 2000', or 'European areas in 2000',...) without presuppositions on former or posterior definitions, such as would be the case with the UE or OMC...

3.4.1.4 Statistical data of reference

Temporal projections of indicators will be done starting from data of reference. Those on which we work are related to the spaces defined previously as 'spaces of reference in 2000'.

From there, various interpolations essential to the estimated temporal values will be done. Many scenarios will necessarily arise according to the availability of the time series. In addition, if this availability of information is not homogeneous for the whole studied geographical entities, it will be very difficult, even impossible, to have comparable methods of estimation: for example, can we estimate the population in 2025 for each State (State division of reference = 2000)? To obtain a homogeneous result, should we choose a single method or apply a differentiated method (according to the series' length, its form, regional behaviour...) for which we will preserve parameters and evaluated elements of the result? It is the general problem of synchronising time series, problem increased by synchronisation with the spatial part of the studied objects (malleability of the borders, aggregations...). The diagram below illustrates - simply for 2 geographical dates and 2 units - the difficulty.

3.4.1.5 Thematic heterogeneity

The rough indicators must be comparable from a Geographical Unit to another: the construction of these indicators must ensure their definition is homogeneous in time and space (the difference of definition of the Geographical Unit is a problem: the example of the differences in density in Franco-Belgian communal space shows well that the grids constitute an obstacle with the harmonisation of European data). This problem of definition is more related to the harmonisation of national information gathering protocols than to databases; it is important to keep it in mind when implementing future harmonised databases. The semantics of the indicators can indeed be extremely different from a database' source to another: individuals taken into account are not necessarily from the same type despite a common denomination (for example, the Franco-Belgian communes) and the indicators which describe them, can in fact correspond to an extremely different reality.

3.4.1.6 Functions of temporal correspondence between spatial statistics and spatial entities

Before speaking about estimation of indicators, the preliminary question of synchronization is between spatial part and statistical part (indicator) of the request. The table below gives the possible configurations of the question:

| | Indicator at time T | Indicator at time T not specified |
|--|--|-----------------------------------|
| Space of reference with defined T | « population 1850 in the shape of 1999 » | « population of France in 1999 » |
| Space of reference when T is not specified | « population 1990 of France » | « population of France » |

To generalize the reflection, the problem to be solved can be expressed in the following way:

A request has the form (I, TI) x (E, TE):
with I the indicator at time TI expressed on the space E whose contours are those defined in time TE;

Several possible cases

- (I, TI) x (E, TE): space and indicating are expressed on their respective date;
- (I, ?) x (E, TE) <=> (I, TE) x (E, TE): the date of I is not specified but the space one yes, then to take the value of I at the same date as studied space;

- $(I, TI) \times (E, ?) \Leftrightarrow (I, TI) \times (E, TI)$: on the contrary, if the date of existence of space is not specified, the appointed date is the indicator one;
- $(I, ?) \times (E, ?) \Leftrightarrow (I, TE) \times (E, TE)$ where TE is the most recent TE valid for the E space: if no date is specified, then the date appointed for the indicator as for the space of reference, is the most recent validity of the space in question.

After transformation, it is necessary to verify coherence.

1°) Coherence of the indicators for a given date: for the couples (I, TI) , it is a question of checking that indicator I is well defined in time TI. For example, 'I numbers of cars', we cannot speak about it before the 19th century.

Then, if indicator I is not defined in time TI, several options are possible and to define:

- to announce an error;
- to transform TI into TE (if TE is sensible)
- if TE is not valid for I (for example, the number of cars in the Carolingian empire in 812), then we can try to seek $TI = TE'$ such as it exists a genealogic relation between E and E' (E', TE'). Here, the request is changed: 'the number of cars in 2005 in Europe with the contours of the Carolingian empire of 812'. Here, E', new space of reference, is (partially) current Europe which is downward from the Carolingian empire. Then we transformed the request into a new request: $(IE', TE') \times (E, TE)$.

2°) Coherence of spaces: for the couples (E, TE) , in the same way, we check that E is well defined for TE. For example, E, a space called Europe, does not exist into 812.

Then, if space E is not defined in TE, then several options are possible and to define:

- to announce an error
- transform TE into T_{maxE} (or T_{minE} or T_{moyE}) with T_{maxE} the last date possible to speak about E
- transform E into E' with E' genealogically related to E and so that the couple (E', TE) is correct.

In addition, in a more pragmatic way, the problem of these recomputed data with different temporalities arises: will they be absent from database? Physically accessible? Or kept in cache memory?

3.4.1.6.1 Estimation of the missing indicators

For the statistical part, we agree that an intermediate value can be estimated. A battery of functions of correspondence could be proposed to the user, like, for example functions of interpolation. The estimated indicator will be accompanied by a degree of confidence and adequacy of the estimation method compared to the data available. According to the morphology of the time series, a logical but optional solution will be proposed (family of functions of interpolation for example, or indicating statistics of position (moving average...)). Thus, choices of methods, classified in order of relevance, will be proposed to the user. Finally, the system will remain open to other formulations of estimation functions and the user will choose himself the principle of calculation of the missing values, guided by the suggestions of the system.

3.4.1.7 Spatial traps...

The interpolation (for example) will be impossible to carry out for the spatial part of the same geographical entity on two dates because the encountered problems are then impossible for the following reasons:

- Deformation functions are very complicated
- There are different multiplicities of the geometric elements for each one of these spatial entities
- The stages (temporal) of a morphing can not be used in division for data-gathering
- Problem about homogeneity of generalizations
- How to find a division whereas the name is uncertain? With a list of names representing the same paradigm? => Formulation of request.

Because borders are not stretchable or do not retract gradually, we will associate to a space its moment of division's definition, insofar we work essentially on administrative entities whose contours exist on the sufficiently stable mid- and long terms.

3.4.1.8 General structure of the long term database

The first model developed was carried out using the language of modelling UML. It is a conceptual model with a language allowing an abstraction of reality.

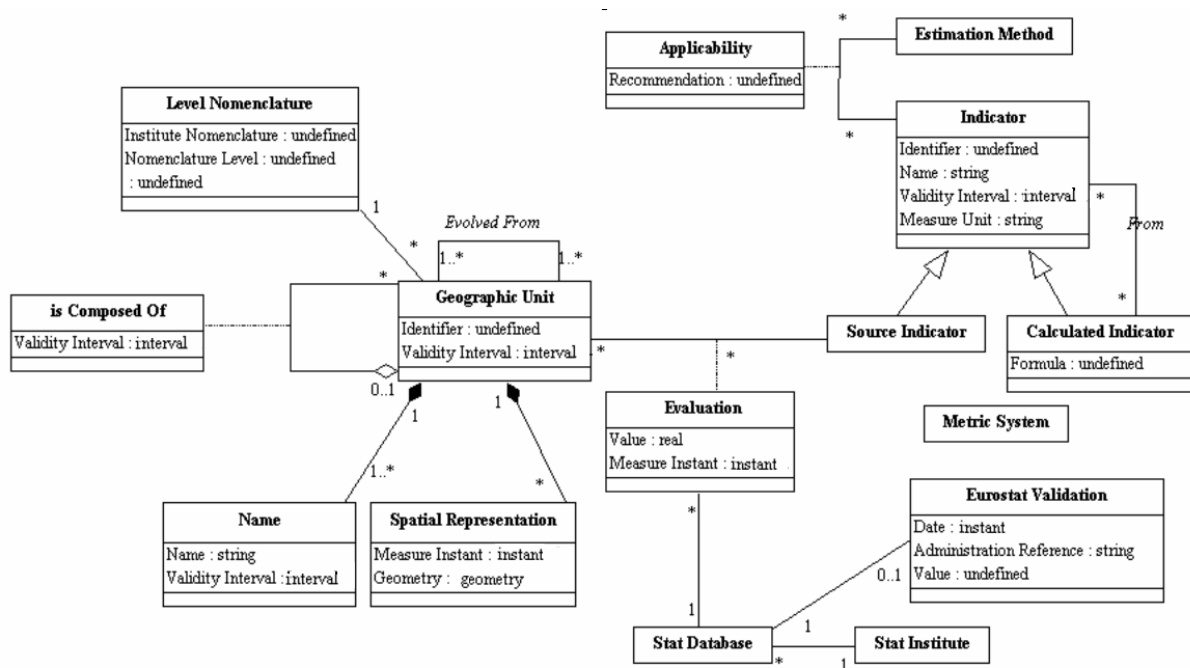


Figure 69 General structure of the long term database

3.4.1.9 Geographical entities

They have a spatial part (Spatial Representation) and a semantic part (Geographic Unit)

Spatial Representation:

It is a class defining the geometrical representation of a geographical unit (defined by the class Geographic Unit). The variable *Measure Instant* gives the date on which the shape was defined by measurement. The variable *Geometry* gives the geometrical definition of shape.

Geographic Unit:

It is the descriptive part of the geographical units of which the spatial part is described by 'Spatial Representation'. These units can come from an aggregation or disintegration (class of association is *Composed Of*) starting from other basic geographical units. These aggregations or disintegrations are valid during a given period (represented by the variable *Validity Interval* in the class of association *is Composed Of*). These units have an identifier and a period of validity during which this geographical unit can be considered.

A geographical unit has a name represented by the *Name* class. This name is valid during a given period. This modelling allows, for example, to take into account the geographical units whose shapes do not change but their name does (example, the NUT 'Côtes du Nord' became 'Côtes d'Armor').

Similarly, dedicating a class to the representation of a geographical unit' shape can take into account units whose shapes change but not their name (example, the NUTS of the 'Isère' in the Sixties, lost communes to the NUTS 'Rhône'). The association 'evolved from' represents the different genealogical stages of a geographical unit. This association allow managing the evolutions of a space; for example, the passage from the Carolingian empire in Europe.

Level Nomenclature

The class 'Level Nomenclature' allows knowing the exact significance of the nomenclature of division of the basic geographical units, such as for example the NUTS one. This class has three fields: the institution which established this level of nomenclature, the codified level of nomenclature and its textual representation (what allows gaining much place in the database).

3.4.1.10 Indicators

Indicator

This conceptual class defines an indicator by its identifier, its name, its period of validity. This class specialises itself into two subclasses *Source Indicator* and *Calculated Indicator*.

Source Indicator and Calculate Indicator:

These two classes allow distinguishing the original indicators (class *Source Indicator*) from the calculated indicators (class *Calculated Indicator*). The association class *Evaluation* between the class *Geographic unit* and *Indicator Source* gives the value (variable *Value*) of an original indicator for a geographical unit at a given moment (represented by the variable *Measure Instant*). This information (value and instant) is obtained from a database represented by the class *StatDatabase*. This database was produced by a statistical Institute represented by the class *Stat Institute*. If the database was validated by Eurostat, an object of the class *Eurostat Validation* represents the date of this validation (variable *Date*), the administrative reference of this validation (variable *Administration Reference*) and finally measurement associated with this validation (variable *Value*).

StatDatabase

StatDatabase is the representation (voluntarily very simple) of a database source from which we extract indicators. Its simplified representation is due to the fact that information related to it can be obtained by directly questioning this database source. That means that we only need to know where this data base is, from which the information stored in our harmonized database, is extracted.

Statistic Institute

The statistical institutes are the suppliers of *StatDatabase* (databases source). We maintain also information about the *StatDatabase* validity according to the criteria defined by Eurostat - *StatDatabase* provided by a statistical Institute.

Method of estimation

The class *Method of estimation* allows associating several methods of estimation to an indicator, original or calculated. This class is meant to use the methods of interpolation or all other methods of estimation.

The association *Applicability* allows associating a coefficient of recommendation (variable *Recommendation*) to each method indicated to estimate an indicator.

3.4.2 Data collection and preliminary cartographic results**3.4.2.1 Definition of target data to be collected in LTDB**

The aim of the LTDB is not to collect an important number of indicators but to focus on the most useful and general criteria which can be a basis for the elaboration of political scenarios. The analysis of data situation by IGEAT and Géographie-cités lead to the conclusion that the most interesting indexes that we can expect to harmonise during the year 2005 are the one presented in table 30 with target NUTS level and approximate target time period of data collection.

| | TARGET PERIOD⁹⁴ | | | |
|--------------------------|-----------------------------------|---------------------|------------------|------------------------|
| | 1960-65 | 1980-89 | 1995-2005 | 2020-2040 |
| AREA | <i>NUTS 2-3</i> | <i>NUTS 2-3</i> | NUTS 3-5 | <i>NUTS 3-5</i> |
| DEMOGRAPHY | | | | |
| total | <i>NUTS 2-3</i> | <i>NUTS 2-3</i> | NUTS 3-5 | <i>NUTS 0-2</i> |
| by age & sex (census) | <i>NUTS 2-3</i> | <i>NUTS 2-3</i> | NUTS 3-5 | <u><i>NUTS 0-2</i></u> |
| Birth (5 years average) | <i>NUTS 2-3</i> | <i>NUTS 2-3</i> | NUTS 2-3 | <u><i>NUTS 0-2</i></u> |
| Death (5 years average) | <i>NUTS 2-3</i> | <i>NUTS 2-3</i> | NUTS 2-3 | <u><i>NUTS 0-2</i></u> |
| ACTIVE POPULATION | | | | |
| Total | | <i>NUTS 2-3 (*)</i> | NUTS 3-5 | <u><i>NUTS 0-2</i></u> |
| by sector (I / II / III) | | <i>NUTS 2-3 (*)</i> | NUTS 2-3 | <u><i>NUTS 0-2</i></u> |
| GDP | | | | |
| Total | | <i>NUTS 2-3 (*)</i> | NUTS 3 | <u><i>NUTS 0-2</i></u> |
| by sector (I / II / III) | | <i>NUTS 2-3 (*)</i> | NUTS 2-3 | <u><i>NUTS 0-2</i></u> |

(*) available only for EU15 + CH & NO

Italics: data from Euroscope (IGEAT- Géographie-cités)

Bold: data from Eurostat, Eurogeographics and ESPON database

Underlined: estimation realised by international organisation (state level) or ESPON project (regional level)

Table 30 Target data collection of ESPON long term database

The thematic diversity of indicators to be collected is apparently limited but it is important to consider that some of them are very expensive (age and sex structure, birth and deaths by five year period) and that all target variables are raw count variables which can be combined together in order to produce a great diversity of indicators of high interest for territorial planning. For example, the estimated expectancy of life can be deduced from the combination between age structure and deaths, through the application of a standard life table. Apparent migration rate can also be deduced from the combination between population at different time period and natural increase (but with an important level of uncertainty). Both index would be very useful for the measure of territorial cohesion (see. ETCI) in a long term perspective. Concerning economic competitiveness, all classical combinations of GDP with total population, active population, economic sectors, etc. can be deduced from basic information, providing a long term view of the economic evolution of Europe. What is really missing is the environmental dimension, even if some insight on this topic can be given by the evolution of population density across Europe. The possibility of applying the same data-model to the raster-based Corine Land Cover data will be evaluated.

3.4.2.2 Primary collection of data and historical dictionary of territorial units

The most difficult problem to be solved is probably not the collection of numbers (which are available in most case) but the precise identification of territorial units which are characterised by these figures. As explained in previous section on data modelling, the crucial problem for LTDB is to identify very precisely the timetable of administrative change

⁹⁴ Data collection will be attempted for at least one year during each target period.

of territorial units in all states of the ESPON area. The fact that the name of a territorial unit remains the same is not necessarily a guarantee that the spatial extension also remains the same.

- **Dramatic changes of territorial units** are obvious problems for data harmonisation because they oblige to produce estimations or to introduce very expensive data collection at lower level like NUTS 5. But, in a sense, they are not very dangerous because they are precisely obvious and produce immediately a procedure of measure of uncertainty estimation and are related to warning messages which prevent the reader against any mistakes in the interpretation of results.
- **Small changes in territorial units** are much more dangerous because they are not necessary depicted on maps but can produce very important changes on statistical results, especially in the case of measures of evolutions. The typical situation is the case of metropolitan area which enlarge their administrative territory at a given period of time, adding a few local units, but without changing their name. The increase of territory produce an important increase of raw count variables (population, GDP...) and an equivalent important decrease in the neighbouring regions which has lost part of their territory. As the territorial change is very limited, it is not necessary visible on maps (which are not necessarily revised) and it can be ignored by the author of the database if he has not a perfect knowledge of administrative changes at all levels. As a result, the map can display opposite rates of variation in neighbouring units subject to territorial changes which are not related to brutal change in demographic or economic attractiveness but simply to the modification of territorial divisions!

The previous discussion indicates that some automatic spatial procedures can be developed for the detection of small changes in territorial division (research of neighbouring territorial units with opposite rates of variation) but it is not sufficient to guarantee a perfect quality of long term database and the only sustainable solution is probably a survey on the historical evolution of administrative division in all states of the ESPON area. It will probably be necessary to contact all statistical institutes of the 29 states of the ESPON area for such a survey which could be supported by the ECP network. The research teams involved in the project LTDB (IGEAT, Géographie-cités, RIATE) has already gained a good experience of such territorial changes through the common elaboration of the Euroscope database (1960-1989) but there information has to be completed by a systematic survey which could be launched by ESPON Coordination Unit or Eurostat.

3.4.2.3 Cartographic outputs of LTDB

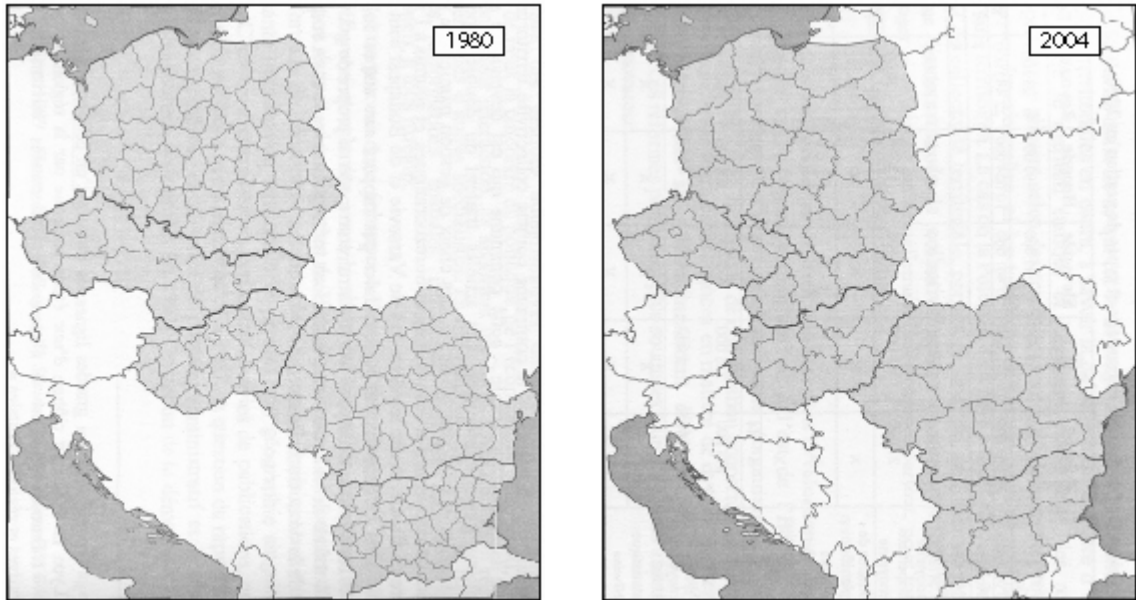
According to the data model of LTDB, it is not immediately possible to produce maps of evolution after data collection, because information on territorial units are collected 'as they are' at the time period of elaboration. It means that the LTDB is not organised as a classical table where all lines refer to the same territorial unit at each period of time and where it is possible to compute easily ratio of evolutions. The production of such harmonised table is of course a crucial function of the LTDB but it is not necessarily the only one and, in certain cases, it is more interesting to directly use initial information despite the fact that territorial units are not the same at different time periods. To illustrate this point, we propose 2 different examples of maps related to evolution of population in Europe from 1960 to present.

- **The map of the evolution of population in central part of Europe from 1960 to 1985 (Fig. 71)** has been realised in a classical framework of territorial units

because for this period the territorial divisions of the target space was sufficiently stable to find a compromise based on a mixture of NUTS level: NUTS 1 for Germany and Austria, NUTS 2 for France and Belgium, current administrative divisions for east-central European countries. The only important problem was related to Poland which changed its territorial units in 1975, but the statistical institute had realised a retrospective evaluation of the situation prior to 1975 in the new territorial divisions post 1975. This map remains of course not perfect and we can suspect that small changes in territorial units has introduced some biases, as in the case of Praha and Central Bohemia in 1970-75. But the solution of NUTS mixture appears sufficient to obtain a good picture of the evolution of population during the period 1960-1985 without introduction of further statistical artefacts.

- **The map of evolution of population of the ESPON-29 area between 1980 and 2000 (Fig. 72)** can not follow the same cartographic methodology because the number of states to cover is higher and the number of territorial divisions which have heavily changed during the period 1980-2000 is much more important. The period 1989-1995 is a major discontinuity in terms of changes of territorial division because many countries from east-central Europe considered the territorial division as a symbol of the socialist period that they wanted to abolish. The preparation of adhesion to EU introduced at the same time the obligation for candidate countries to propose NUTS divisions of several level, which increased the trend towards reorganisation of administrative divisions in east-central Europe (Fig. 72). At the same period, some important changes in NUTS divisions were also realised in the western part of Europe, especially in Portugal and United Kingdom, producing discontinuities in time series provided by Eurostat-Regio before 1995. For the project LTDB, **the period 1989-1995 is a real nightmare** and the more pragmatic solution is to avoid actually this period for the elaboration of time series and to focus on the connexion between the time period of relative administrative stability located before (1960-1989) and after (1995-Present). When we look at the administrative situation of territorial units of the ESPON space in 1980 and 2000, we can observe that some states have kept more or less the same administrative divisions (France, Belgium, Spain, Italy, Hungary, Romania, ...) but that an important minority of states has completely changed the NUTS2-NUTS3 divisions which can not be properly recovered without a full disaggregation at NUTS 5 level which would be very expensive and is even not sufficient in certain cases where local units have also been modified. This task of precise recomputation of old databases in current administrative division is clearly not for ESPON and is rather relevant for national statistical institute, Eurostat or Inspire. What can actually be done in ESPON 3.2 is to provide estimations of main spatial trends with a degree of precision which will be lower than usual NUTS2/NUTS3 division but at least better than simple distribution of evolution by states. Smoothing methods based on gaussian neighbourhood which was presented in ESPON 3.1 and which will be further developed in next months by project ESPON 3.4.3 (MAUP) are probably the most useful for this task. Indeed, they are not only a way to estimate trends within changing territorial divisions but provide a real added value on the evolutions in a transnational framework. After smoothing transformation, what is presented on a map is not the local value of an index but the general trend of this index in a fuzzy neighbourhood based on a parametric function which can introduce a more or less important level of scale transformation. A minimum span of neighbourhood is necessary in order to achieve the elimination of errors related to changing territorial division but it is possible to introduce higher values for the span parameter if one wants to observe more general spatial trends. As a preliminary experiment of such approach, we have realised a map of population variation 1980-2000 with a gaussian neighbourhood span 100 km (for more details, see ESPON 3.1, Final report, dictionary of tools). This map (Fig. 72) is actually at a stage of preliminary elaboration but already provides very interesting inputs for the

elaboration of scenarios. Nevertheless, we prefer to avoid to comment it in detail at this stage as it is only a preliminary example which was not based on a perfect construction of a long term database.



Source: V.Rey, L. Coudroy and E. Boulineau, 2004, *l'élargissement de l'Union Européenne: réformes territoriales en Europe Centrale et Orientale*.

Figure 70 Evolution of territorial divisions in East-central Europe 1980-2004

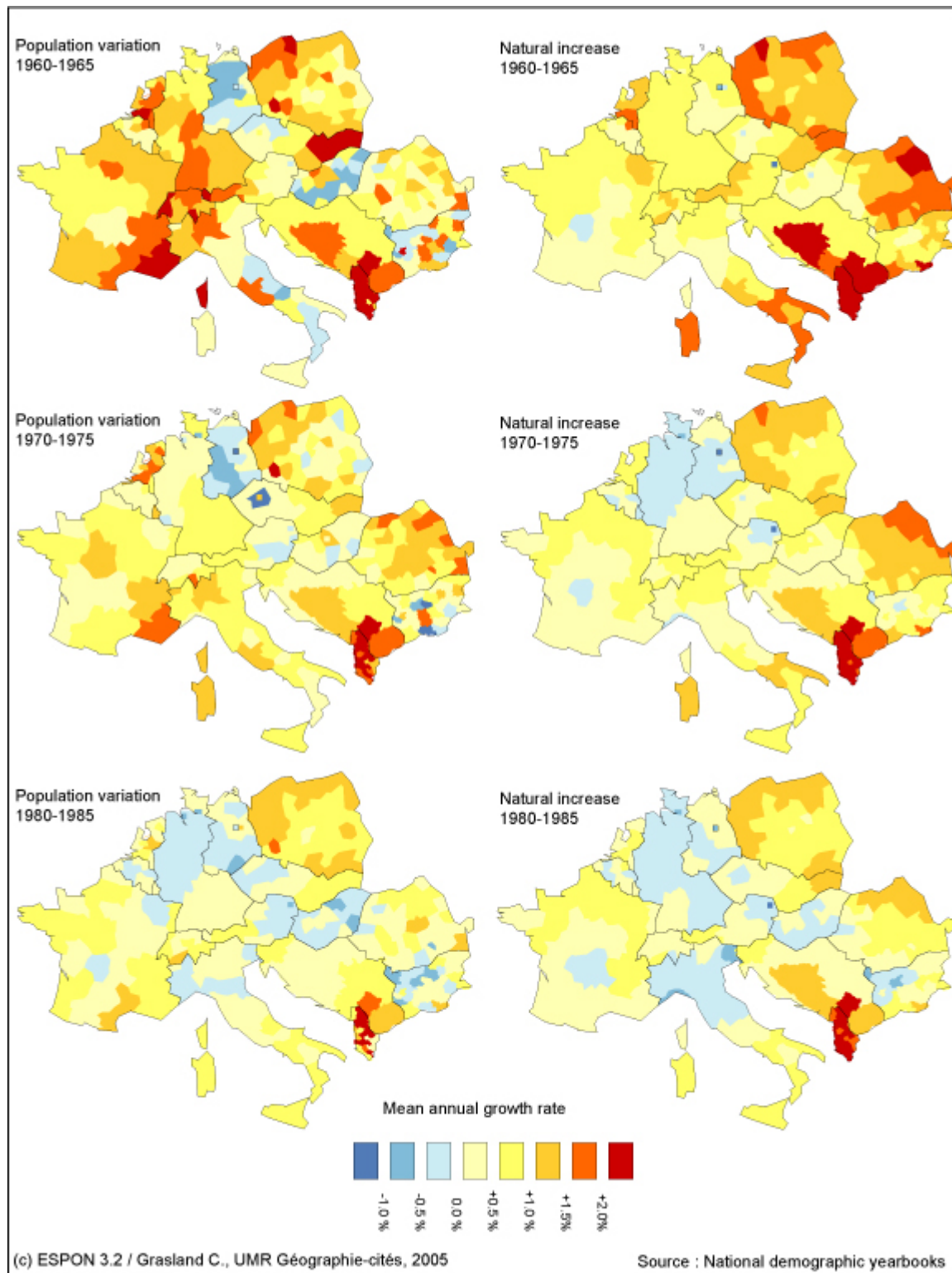


Figure 71 Evolution of population in central Europe 1960-1985

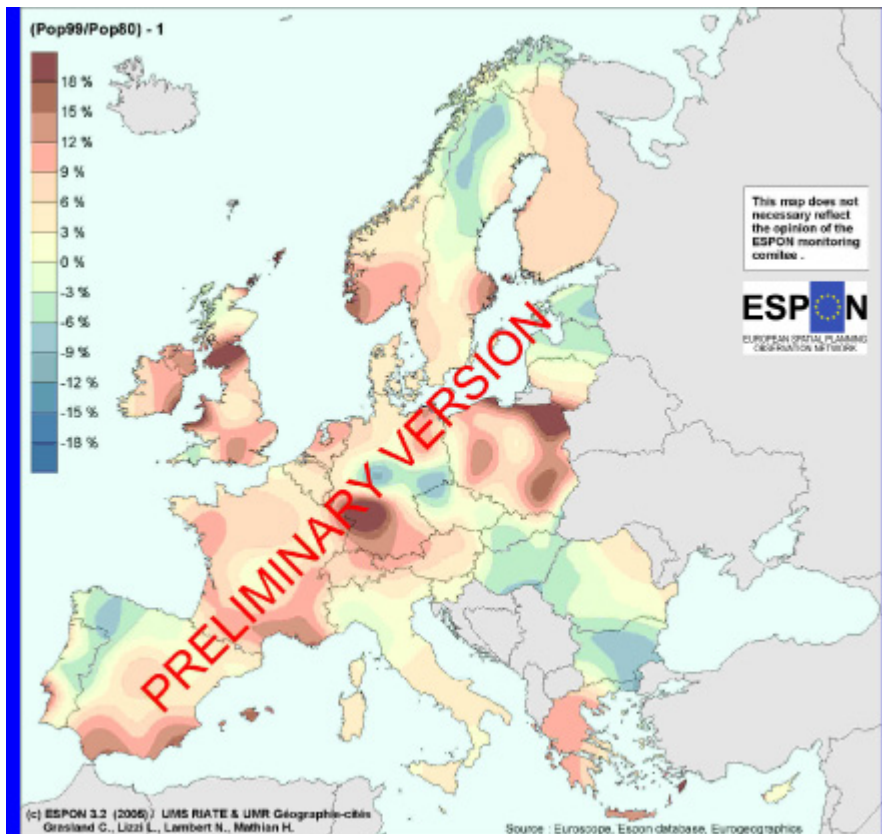


Figure 72 Evolution of population of ESPON 29 between 1980-1999
(Preliminary version)

3.4.3 Next steps until Third Interim Report

- collection and integration of target data (section 3.2.1.2.1 - Definition of target data to be collected)
- testing and improvement of database
- elaboration of maps on the basis of target data, also in support of scenario building
- elaboration of proposition concerning a project on the elaboration of a historical dictionary of territorial units (section 3.2.1.2.2 - Primary collection of data and historical dictionary...)

Chapter 4 Proposal on a communication strategy ensuring a relevant informal debate on prospective/trend scenarios and orientations

4.1 Introduction

ESPON 3.2 requires a number of specific objectives to be met in relation to communication, consultation and validation throughout the project. These include the following requirements:

- *To prepare the scenarios in a cyclical and dynamic process allowing the Monitoring Committee to take active part in the 'scenario team', where the scenarios are gradually developed and tested before the final results.*
- *To prepare and support a communication process exploring the scenarios at political level, that can improve the understanding of spatial development trends and issues of territorial cohesion within an enlarged EU. A communication strategy could include different elements from informal consultations to futuristic stories supported by cartographic illustrations.*

The discussion and proposal below relate to the requirements for the second interim report to:

- propose a communication strategy ensuring a relevant informal debate on prospective/trend scenarios and orientations.
- propose a timetable and strategy for the next phase leading to the Third Interim Report including a communication plan involving in particular the ESPON Monitoring Committee and major stakeholders.

In the First Interim Report (FIR), we argued that the process of communication, consultation and validation is crucial to understanding the role of different policy measures and packages in alternative futures. The FIR proposed a cyclical approach to scenario construction and argued that consultation and validation played an important role in every cycle of the scenario-building process. Moreover, the FIR also highlighted that the consultation and validation process was particularly linked to three areas of project activity:

- Qualitative analysis of trends and driving forces
- Scenario building and the elaboration of scenarios
- Policy recommendations for EU spatial policy

Integrating these activities into the consultation and validation processes was designed to allow for discussion of issues such as:

- the acceptability of different scenarios amongst scientific and policy experts
- the barriers and obstacles to specific policy measures and outcomes
- the robustness of different policy options under different possible futures

The approach adopted by ESPON 3.2 to communication and validation in the scenario building process was established in the FIR and will not be rehearsed here. However, the proposals outlined in the FIR were based on three key principles:

- I. Ensuring that consultation and validation mechanisms are activated and utilized
- II. Utilizing a range of mechanisms to ensure coordinated and continual consultation and validation
- III. Facilitating consultation, dialogue and dissemination through virtual and paper-based media.

These principles were operationalised through a programme of consultation and communication activities stretching the length of the ESPON 3.2 project. In the FIR, the programme was summarised in the form of a table to assist in the clarification of the purpose and details of each stage of the process. The relevance to each stage of the cyclical approach and to output, in terms of interim reports, was charted and the consultation methods to be employed were outlined. Over the period between the FIR and SIR the programme was conditional on a number of points:

- A cyclical scenario process: scenarios are gradually developed and tested.
- The Monitoring Committee will play an active role in the scenario process.
- One ESPON seminar will take place every 6 months.
- A series of workshops were to be held between November 2004 – February 2005 related to the meeting of the ESPON Monitoring Committee, the ESPON Contact Point Network, the Committee of the Regions and the INTERREG networks.

4.2 Communication and Validation: Results since the First Interim Report

The communication/validation strategy for stimulating and supporting the scenario construction work has taken a variety of forms. These have included the following elements:

Meetings and Workshops

Brussels, 24-25 June 2004: TPG workshops to develop scenario types and categories. A post workshop report was circulated to all TPG members for consultation.

Brussels, 22 July 2004: Presentation by lead partner and TPG members to ESPON Monitoring Committee on workshop results and future plans.

Nijmegen, ESPON Seminar, 13 October 2004: Workshop session with Monitoring Committee. The session took the form of brainstorming in smaller sub-groups, which then led to the identification and prioritisation of key themes to be covered in the first round of scenario construction. The scenario themes were subsequently divided between members of the TPG, on the basis of existing subject specialisations, forming the thematic scenarios to be developed.

Nijmegen, ESPON Seminar, 13 October 2004: ECP meeting – discussion of scenario options and methodology

Essen, 8 November 2004: ESPON project 3.1 Wild-card workshop – testing of robustness of policy recommendations

Brussels, 2-3 December 2004: TPG meeting – presentation and discussion of first draft of scenario baselines and scenario sketches: first round of internal (TPG) validation of the scenarios.

Brussels, 6 December 2004: SUD meeting – presentation of scenario hypotheses and discussion with policy makers and other scenario research teams

Brussels, 9 December 2004: MC Meeting – discussion and validation of scenario hypotheses

Brussels, 24-25 February 2005: Interact seminar – presentation of scenario hypotheses and discussion with representatives of the Interreg IIIB areas and spatial vision projects

Brussels, 2 March 2005: TPG meeting – presentation and discussion of second draft of scenario baselines and scenario sketches: second round of internal (TPG) validation and finalisation of scenario baselines and scenario sketches for inclusion in the Second Interim Report

Expert Panel

The FIR stated the involvement of a variety of actors is important for developing coherent scenarios. One aspect of this is the creation of the ESPON 3.2 expert panel. The FIR outlined two principles for the selection of a panel of approximately 50 experts: (1) each expert holds a strategic position in EU, national or regional policy-making or in the scientific world and (2) all the experts together represent a great variety of perspectives on EU territory and cohesion. Additionally, experts should be:

- generalists than specialists
- creative, communicative and highly motivated representative of different types of member states, sectors, disciplines, and aggregation levels (EU, national, regional)

By the December 2004 TPG meeting a pan-European 'potential' expert panel had been constructed, composed of approximately 50 members. These were persons initially nominated by members of the TPG, and in a few cases by some members of the Monitoring Committee. By February 2005 these individuals had been contacted with a view to commenting on the first cycle of thematic scenarios. This report will serve as support for the consultation of these experts.

4.3 Changes to the consultation, communication and validation strategy

The main departure from the original strategy outlined in the FIR relates to the use of the Delphi method. Initially, the strategy had identified conducting a web based Delphi exercise with the expert panel to identify key themes for the scenarios. However, given the time scale for the Interim Reports and the desirability of more extensive Monitoring Committee involvement, we instead used brainstorming sessions with the Monitoring Committee to identify key themes. We believe that this will allow us to make better use of the expert panel and other contacts external to ESPON (Interreg, Committee of the Regions...) after the thematic scenarios have been finalised.

4.4 Next steps

The aim of the communication strategy is to ensure that the consultation and validation mechanisms of the project are activated and utilized between the TPG partners and other relevant stakeholders, most notably the ESPON Monitoring Committee and ECP network. This consultation and validation process the following key activities:

The organisation and collection of data and information from experts to support ongoing scenario elaboration

A key function of the strategy is to support the requirements outlined in the terms of reference to 'prepare and support a communication process... (and) ...bring added value through dialogue'

Following the completion of the thematic scenarios each scenario writing team has been asked to identify three or four key questions or issues concerning which they would like inputs from the expert panel. They have also been asked to identify who, from the expert panel and beyond, would be the most appropriate person to consult. The communication team will contact these experts on their behalf and will seek comments and feedback to ensure that the key issues are being covered and the scenario sketches are validated.

The process for the period following the SIR to June 2005 is to further develop the territorial aspects of the existing thematic prospective policy scenarios. Following this the intention is to:

- discuss these scenarios with various expert and user groups and on the basis of that adapt them and elaborate them further
- combine the 'discussion scenarios' and select them so that we end up with a set of three or four integrated multi-thematic scenarios
- further elaborate these scenarios in a quantitative way

The organisation of feedback and further dissemination of data and information to a wide audience

As part of the communication and consultation strategy for the next phase of the project we propose that the following events and actions identified for a general ESPON communication strategy are key moments where project 3.2 could play key role:

- The proposed ESPON Scientific conference in Oct 2005 – 3.2 to make a presentation and/or lead a workshop session
- The proposed ESPON travelling exhibition – here project 3.2 could have a permanent poster display
- The proposed Open-Day for regional offices – 3.2 to make a presentation
- The proposed 'speaking opportunities' – here members of the 3.2 TPG could be part of the 'pool' of ESPON speakers

As a further extension of communication and consultation we propose that that the TPG members organise (in collaboration with their ECP) local events in their respective countries (if possible with external funding through local ministries or organisations) to consider the specific territorial impacts of the scenarios. The first two of such events are already planned in Belgium and France.

In parallel, the ECPs are organising regional ECP seminars in the context of the ECP financial mechanism. These should also be used for regional feedback on the scenarios once the SIR is published.

Finally, it could be envisaged to publish the thematic prospective scenarios in an ESPON publication or as a scientific publication. This would then be used as a discussion basis at different events. However, this is not possible within the resources constraints of the projects, and other means of financing will have to be found in collaboration with the ESPON CU.

In conclusion, it seems that the most efficient use of resources and the most appropriate way of integrating the project into the entire ESPON process is to make the scenario communication part and parcel of the overall ESPON communication strategy.

4.5 Visualisation

An important element within this communication strategy will be the concrete presentation of the scenarios. Especially in their role as communication tools, scenarios have to be easily and rapidly understood. Visualisation techniques can help in such understanding. However, visualisations can also have negative effects as they favour a superficial understanding and, depending on the type of visualisation, a focus on each stakeholder's 'own' region without a real understanding of the ideas and hypotheses developed in the scenario. This regional focus can also be an obstacle to political consensus as the unsuccessful mapping experience in connection with the elaboration of the ESDP has shown.

Scenarios, especially long-term scenarios, are by nature speculative and cannot, therefore, be correctly quantified. In this context, classical mapping techniques are very limited, and even more so when using the traditional ESPON units of NUTS 2 and NUTS 3. Other, more general and conceptual techniques have to be used to communicate the contents of scenarios.

The approach has to be at least two-folded. On the one hand, there are the quantitative elements which support the scenarios. These are predictive, but only in a probabilistic sense and based on the specifications of a particular model. We propose to use smoothing methods for the visualisation of these quantitative future visions, limited in number and restricted to some selected fields only. The second and different approach is the (carto-) graphic approach on spatial phenomena which cannot be pinned down to specific regions and have to be dealt with on a more abstract level. This can go as far as purely graphic (spatial policy related) interpretation of conceptual elements.

The whole process represents a stepwise approach (although the individual steps do not necessarily depend on each other):

- 1° Indicators (maps from other ESPON projects)
- 2° Smoothing (of predictive quantitative information)
- 3° Overlay of smoothing (in order to display multi-thematic predictive elements)
- 4° Cartographic combination and interpretation (maps of trends and phenomena that can be localised at a macro-scale, but not pinpointed to specific regions = 'spatial impressionism')
- 5° extraction and political generalisation and creation of policy maps (cartographic artwork = 'spatial expressionism and cubism').

In a European spatial visualisation history this process ranges from choropleth maps, smoothed areas to the 1995 French Presidency and 1997 Nordwijk scenarios to the policy oriented Blue Banana visualisation of Brunet. Beyond this there are the attempts of the Cartography Group of the Study Programme dealing with the visualisation of spatial policy aims beyond regions and thinking more in a wider European space.

At this current stage the scenarios are very much text based, as is quite normal for such long-term and complex scenarios. However, with the coming integration of the different tools and quantitative elements into the scenario building process, we are currently working on different proposals concerning graphical representations of scenario contents. These include:

- maps of actual forecasts, notably using smoothing methods to avoid a false impression of precision (see example at the end of section 3.4)
- the development of a common graphical language for more conceptual and qualitative elements

The specific forms this visualisation will take also depend on the final choices made concerning the territorialisation of the scenarios. With the finalisation of the thematic scenarios for this summer, these choices will be known, thus allowing concrete proposals on the visualisation.

4.6 ESPON Knowledge and Communication tool on European spatial scenarios

The development of this Knowledge+Communication tool (K+C) responds to the specific objective stipulated in the ESPON 3.2 terms of reference 'to continue the scientific guidance within the ESPON programme and the further development of innovative ESPON tools'. The K+C tool is service-oriented, aiming not to use advance technology for the sake of using it, but to make a useful contribution to the rest of the ESPON 3.2 project and the whole ESPON Community, only when needed.

Building on the results of ESPON 3.1 policy-approach, the K+C tool is Internet-based, open to the whole ESPON Community, and incorporates as starting point updates of this project's outcomes, syntheses of strategic policy-impact studies, a selection of existing trends and national and European scenarios to be identified, as well as user-friendly tools for data and indicator retrieval and graphic and desktop mapping visualisation, according to the need to explain and present scenarios in a friendly understandable manner.

The starting point is the work carried out by project 3.1 in some technical and scientific aspects, including data collection, spatial tools, further development of an ESPON map-making facilities, as well as preparing for the cross thematic exploitation of integrated results based on all ESPON projects.

The ESPON virtual knowledge base constitutes an innovative tool; and reinforces the scientific integrity and consistency of the 3.2 co-ordinating and territorial cross-thematic project, and therefore inevitably, also that of the ESPON initiative as a whole.



Figure 73 Knowledge and Communication tool on European spatial scenario main interface.

The material included in the scenarios K+C portal so far has been classified into four different sections:

- Spatial Visions: in this chapter are 19 examples of scenarios and visions for three different spatial scales:
 - European (10): Collection of proposals, reflections and research focused on alternative future scenarios for Europe, such as 'Scenarios Europe 2010, Five Possible Futures for Europe. Forward Studies Unit European Commission', 'Perspectives on Europe's Role in the Future, Four Futures of Europe', 'CPB Netherlands Bureau for Economic Policy', etc.
 - National (7): Collection of papers, research and reflections on future scenarios and visions of various countries, like 'Finland 2015 programme', 'National Spatial strategy for Ireland 2002-2020, Ireland', 'What France in 2020? Some directions for planning Europe's future', etc.
 - Regional (2): Visions and reflections on possible scenarios for the future at a regional scale. As examples, they are available 'Catalunya 2020', 'Better Governance: An outlook on a transparent organisational model'.
- Sectorial Visions: contains 17 links to papers, research, scenarios and visions for different sectoral activities. They are classified as follows: Demography (3), Environment

(2), Economics (6), and Transport (2). It also contains a short collection of papers and research documents obtained from independent advisors and the media.

- Trends: More than 35 papers, databases, possible scenarios and trends are collected in this chapter. Sixteen links to prospective institutions and research centres are also available. Reference material, data, hotspots and documents about the world future and global trends in different scenarios and sectors, as well as links to prospective institutions, altogether configuring alternative scenarios are available.
- Modelling Resources: This chapter aims to become a tool-kit for scenario-building processes. It is divided into three different themes, altogether containing more than 80 links to on-line software, institutions, papers and data. The chapter is divided as follows: software and links (65), methodology and (4) papers (20).

Moreover, user-friendly tools for data and indicator retrieval and graphic and desktop mapping visualisation have been developed. This interactive graphing and mapping tool serves as a basis for the representation of scenarios. It is being programmed as a user-friendly tool to map indicators at different administrative levels and time horizons through Internet. There is a draft prototype that MCRIT developed for ESPON3.1 (www.mcrit.com/espon/maps) as first phase for ESPON-GIS, which will now be reprogrammed completely to support the visualisation of indicators forecasted by simulators or already calculated.

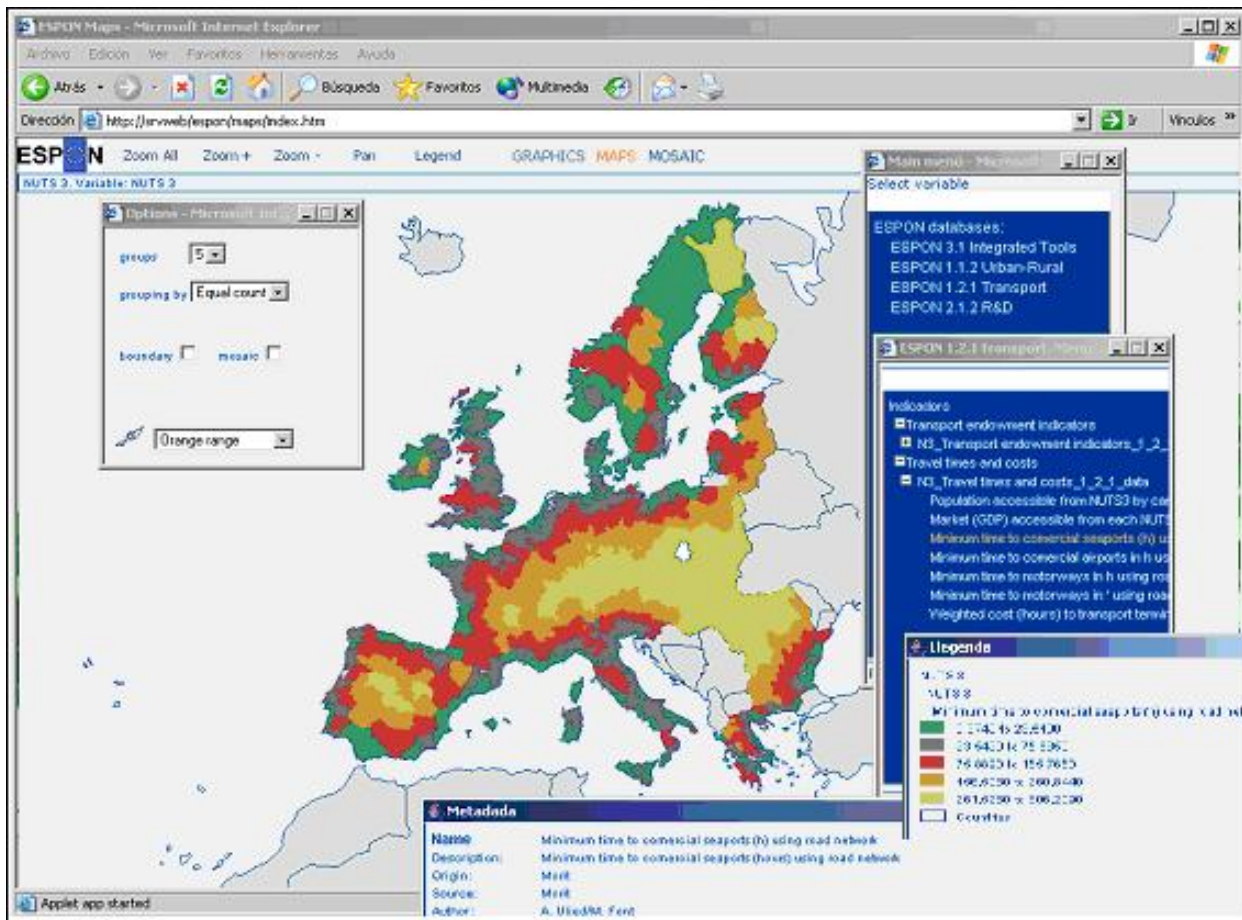


Figure 74 Mapping tool (existing version to be reprogrammed to support the visualisation of ESPON3.2 indicators for future scenarios at regional level).

Linked to this visualisation tool, user-interfaces for simplified versions of simulators developed on EXCEL-Visual Basic and commercial GIS systems will be provided.

These interfaces are yet to be defined based on the needs of the project. More advanced visualisation of results (e.g. traffics along corridors and networks) are displayed through commercial GIS.

Chapter 5 Report on progress of scientific guidance and common platform as well as development and maintenance of the ESPON data base and mapping collection (taking over tasks and responsibility of project 3.1)

Introduction

Since the Nijmegen seminar in October 2004, project 3.2 has taken over the task of scientific coordination of the programme as a whole, including the maintenance of the ESPON scientific platform. This includes several elements which aim at offering the different TPGs a certain amount of guidelines and information concerning elements common to all teams, but also to collect and centralise the important results of the different projects.

The Nijmegen Guidance Paper (annex 1) contains all the information concerning the current state of and the future plans for the scientific coordination, covering the following issues:

- Common concepts
- Indicators and typologies
- ESPON data management
- Tools and methodologies
- Common designs and layouts
- Policy recommendations

In summary, the main objectives for the next two years for the ESPON scientific platform are the following:

- concepts
 - final version of ESPON key political concepts glossary
 - final version of inventory of concept usage
- indicators and typologies
 - application of data update strategy, including pool of indicators for annual key indicators
 - dictionary of ESPON indicators and typologies
- data management
 - proposition for integration into long-term database
- tools and methodologies
 - ESPON tools/methods navigator

For more details, see the Nijmegen Guidance Paper, except for some issues concerning indicators and typologies and the issue of data maintenance and updates developed in the following sections.

ESPON indicators

Within the ESPON data base around 3000 data has been included by now, roughly divided into raw data and indicators, the latter defined as calculated values on the basis of raw data or as result of model calculations.

According the most recent investigation the ESPON database includes a total number of 1021 indicators, of which 186 are labelled as 'core indicators' (although some are counted several times since they are available for more than one year), 37 are RCE indicators and 21 are indicated as typologies. 35 out of the total number of indicators are geographical and regional references.

An investigation of the ESPON indicators in relation to potential future update shows that the vast majority of indicators is based on Eurostat data and national statistics:

1. 758 indicators are based on Regio data and additional national data with potential yearly update notwithstanding known Eurostat data problems and with national adjustments according international definitions. The main part of the core indicators belongs into this category. The yearly update is possible on the well known restrictions of not always full EU 25 regional or temporal coverage, the need of data supplementation for Switzerland and Norway, including the need of estimations of data in case of differing definitions. Not all of the data provided exists in full ESPON coverage yet (some agricultural data).
2. 99 indicators are from EU institutions and international institutions, mainly to be updated periodically or in long-term perspective (Corine). Altogether 9 of the core indicators belong into this category. Related to landuse data of Corine a periodic update with the new landcover is possible and will be done in short term when the data of the land use account is available. Other main core indicators in this group are related to natural and technological hazards.
3. 26 of the total indicators, 5 of them core indicators are based on mainly national sources of selected years which could be updated only with greater efforts. The core indicators in this group refer in general to functional urban areas and Metropolitan European growth areas. If these areas are to be seen as constant, the existing typology can be reused and no data updates are necessary. If, however, the areas are to be studied themselves, including their delimitations, then would imply an update, and, therefore, intensive data collection.
4. 138 indicators are based on model calculations which could not be updated without specific knowledge of the models or specific data infrastructures and software. 9 core indicators belong to this group, all in the field of accessibility. The update of this data is not possible without the project related model background.

As this evaluation shows the importance of the indicators and the frequency at which they can be updated is in most cases more a matter of appropriate regional statistical information and the human power to manage a central update of the data of the above mentioned category 1 and partly also in category 2. However, category 3 implies a much

heavier work load and category 4 depends on copyrights on models and data and can, therefore, not be solved by a simple increase of manpower.

ESPON typologies

The so-called ESPON typologies should provide a special view of the ESPON space allowing to identify differences and to analyse the causes of these differences. They are not simple benchmarking tools showing which region performs well on a particular indicator, but analytical tools which show the territorial structure of Europe. Ideally, each ESDP topic for which this is feasible should be represented within ESPON by a core typology allowing other teams to analyse their results within the ESDP topical types of regions.

Many TPGs have developed typologies crossing several indicators. The main important typologies have been introduced into the list of ESPON core typologies. In final report of project 3.1. a list of 34 different typologies can be found.

However, many of these typologies do not really fit into the above definition as they are closer to a discretisation of variables than to a 'real' typology which we understand as a data-reduction which brings more added-value than just the simple addition of several variables. In other words, the specific combination of information should bring to the light very particular spatial characteristics which would remain unseen by looking at the different components individually.

In view of the very diverse nature of the typologies currently included in the ESPON core typologies list, we have begun a process of identifying those typologies which can be considered as the 'core' ESPON typologies.

In this sense a first step to revise the existing list has been undertaken eliminating those core-typologies which are either just discrete representation of single indicators or simple spatial references. The results of this first round of selection can be seen in table 31.

A further evaluation has to be done on the basis of the ESDP policy aims. The relevant policy aims are already part of the ESPON database meta information and have been used by some of the projects. This will be the base for further investigation in the next step.

| Spatial types | Spatial classes | TPG responsible | Spatial scope | Regional level | | Year |
|--------------------------------------|--|-----------------|---------------|----------------|--------|------|
| Urban areas | 1 Global level | 1.1.1 | EU27+2 | NUTS 3 | NUTS 5 | 2000 |
| | 2 International level | | | | | |
| | 3 National/transnational level | | | | | |
| | 4 Regional level | | | | | |
| | 5 Local level | | | | | |
| Functional urban areas (FUAs) | 1 Metropolitan European Growth Areas (MEGAs) | 1.1.1 | EU27+2 | NUTS 3 | NUTS 5 | 2000 |
| | 2 transnational / national FUAs | | | | | |
| | 3 Regional / local FUAs | | | | | |
| MEGAs | 1 Global nodes | 1.1.1 | EU27+2 | NUTS 3 | NUTS 5 | 2000 |
| | 2 European Engines | | | | | |
| | 3 Strong MEGAs | | | | | |
| | 4 Potential MEGAs | | | | | |
| | 5 Weak MEGAs | | | | | |
| 6 Types NUTS 3 FUAs | 1+ Monocentric NUTS 3 (FUA exceed NUTS 3 boundaries) | 1.1.1 | EU27+2 | NUTS 3 | NUTS 5 | 2000 |
| | 0+ NUTS 3 region neighbouring 1+ NUTS 3 region | | | | | |
| | 1 monocentric NUTS 3 (only 1 FUA) | | | | | |
| | 2 bipolar NUTS 3 (two FUAs) | | | | | |
| | 3 polycentric NUTS 3 (three or more FUAs) | | | | | |
| | 0 no FUA | | | | | |

| Spatial types | Spatial classes | TPG responsible | Spatial scope | Regional level | | Year |
|--|---|-----------------|---------------|----------------|--|------|
| Urban - rural Spatial types | 1 High urban influence - high human intervention | 1.1.2 | EU27+2 | NUTS 3 | | 2000 |
| | 2 High urban influence - medium human intervention | | | | | |
| | 3 High urban influence - low human intervention | | | | | |
| | 4 Low urban influence - high human intervention | | | | | |
| | 5 Low urban influence - medium human intervention | | | | | |
| | 6 Low urban influence - low human intervention | | | | | |
| Cross-border functionality and participation | Symmetric with small differences between neighbouring regions and suitable infrastructure for cross-border integration (1) | 1.1.3 | EU27+2 | NUTS 3 | | |
| | Symmetric with small differences between neighbouring regions but important barriers for cross-border integration (3) | | | | | |
| | Asymmetric with large differences between neighbouring regions and suitable infrastructure for cross-border integration (2) | | | | | |
| | Asymmetric with large differences between neighbouring regions but suitable infrastructure for cross-border integration (4) | | | | | |

| Spatial types | Spatial classes | TPG responsible | Spatial scope | Regional level | | Year |
|--------------------------------------|---|-----------------|---------------|----------------|--------|-----------|
| Population change | Increase of population with in-migration and natural increase (1) | 1.1.4 | EU27+2 | NUTS 3 | | 1995-1999 |
| | Increase of population with in-migration and natural decrease (2) | | | | | |
| | Increase of population with out-migration and natural increase (3) | | | | | |
| | Decrease of population with out-migration and natural decrease (4) | | | | | |
| | Decrease of population with in-migration and natural decrease (5) | | | | | |
| | Decrease of population with out-migration and natural increase (6) | | | | | |
| Spatial types of depopulation | Very strong depopulation (1) | 1.1.4 | EU27+2 | NUTS 2/3 | | 1995-1999 |
| | Strong depopulation (2) | | | | | |
| | Depopulation (3) | | | | | |
| | Possible depopulation (4) | | | | | |
| | No depopulation (5) | | | | | |
| Accessibility and GDP | 1 Successful regions with high accessibility | 1.2.1 | EU27+2 | NUTS 3 | NUTS 5 | 2000 |
| | 2 Successful peripheral regions | | | | | |
| | 3 Lagging regions in the European core | | | | | |
| | 4 Lagging peripheral regions | | | | | |

| Spatial types | Spatial classes | TPG responsible | Spatial scope | Regional level | | Year |
|--|---|-----------------|---------------|----------------|--------|------|
| Spatial types of infrastructure endowment | D Strongly mobility dependency with need of process government (Low level of infrastructural density and poor use level) | 1.2.1 | EU27+2 | NUTS 3 | NUTS 5 | 2000 |
| | C Risk of congestion and need for distribution of activity (High level of infrastructural density and poor use level) | | | | | |
| | B Congestion regions with need of infrastructural improvement (Low level of infrastructural density and good use level) | | | | | |
| | A Unproblematic and use adequate poor infrastructure but (Low level of infrastructural density and good use level) | | | | | |
| Broadband penetration / Introduction of Competitive provision | 1 High broadband - early competition | 1.2.2 | EU27+2 | NUTS 2 | | |
| | 2 High broadband - late competition | | | | | |
| | 3 Medium broadband - early competition | | | | | |
| | 4 Medium broadband - late competition | | | | | |
| | 5 Low broadband - early competition | | | | | |
| | 6 Low broadband - late competition | | | | | |

| Spatial types | Spatial classes | TPG responsible | Spatial scope | Regional level | | Year |
|--|---|-----------------|---------------|----------------|--------|------|
| Telekom supply and demand characteristics | 1 Core Urban Rich | 1.2.2 | EU27+2 | NUTS 2 | | |
| | 2 Core Urban Poor | | | | | |
| | 3 Core Rural Rich | | | | | |
| | 4 Core Rural Poor | | | | | |
| | 5 Periphery Urban Rich | | | | | |
| | 6 Periphery Urban Poor | | | | | |
| | 7 Periphery Rural Rich | | | | | |
| | 8 Periphery Rural Poor | | | | | |
| Hazard potential and vulnerability | Ordinal Spatial types taking into account degree of hazards and vulnerability | 1.3.1 | EU27+2 | NUTS 3 | | 2000 |
| Regions by type of impact of ICTs policies | Lagging regions reacting to cohesion ICTs policies | 2.1.1 | EU27+2 | NUTS 3 | NUTS 5 | 2000 |
| | Lagging regions reacting to all ICTs policies | | | | | |
| | Non lagging regions with low needs of ICTs policies | | | | | |
| | Non lagging regions reacting particularly to efficiency policies | | | | | |
| Central-peripheral Spatial types | 1 Most accessible region | 2.1.1 | EU27+2 | NUTS 3 | NUTS 5 | 2000 |
| | + or - centrality and peripherality | | | | | |
| | n peripheral regions | | | | | |

| Spatial types | Spatial classes | TPG responsible | Spatial scope | Regional level | | Year |
|--|---|-----------------|------------------|----------------|--------|------|
| Lagging Regions | 1 lagging regions | 2.1.1 | EU27+2 | NUTS 3 | NUTS 2 | |
| | 2 potentially lagging regions | | | | | |
| | 3 non lagging regions | | | | | |
| R&D and innovation capacity | High R&D capacity and high innovation capacity | 2.1.2 | EU15 (EU27+2) | | | |
| | High R&D capacity but low or medium innovation capacity | | | | | |
| | Low or medium R&D capacity but high innovation capacity | | | | | |
| | Medium R&D capacity and medium innovation capacity | | | | | |
| | Low R&D capacity and low innovation capacity | | | | | |
| Rural Areas | 1 predominantly leading rural areas | 2.1.3 | EU27+2 | | | 2000 |
| | 2 predominantly lagging rural areas | | | | | |
| | 3 intermediate leading rural areas | | | | | |
| | 4 intermediate lagging rural areas | | | | | |
| | 5 leading urban areas | | | | | |
| | 6 lagging urban areas | | | | | |
| Less favoured areas | 1 permanent handicaps (altitude, poor soils, climate, steep slopes) | 2.1.3 | EU27+2 | | | 2000 |
| | 2 undergoing depopulation or having very low densities of settlement | | | | | |
| | 3 experiencing poor drainage, having inadequate infrastructures, or needing support for rural tourism, crafts and other supplementary activities. | | | | | |

| Spatial types | Spatial classes | TPG responsible | Spatial scope | Regional level | | Year |
|--|--|-----------------|---------------|----------------|--|------------------------|
| Agricultural holdings | Level 1: General farm types | 2.1.3 | EU27+2 | | | 2000 |
| | Level 2: Principal farm types | | | | | |
| | Level 3: Particular farm types | | | | | |
| | Level 4: Subdivisions of level 3 | | | | | |
| Dominant Structural funds spending | R Regional development, productive infrastructure | 2.2.1 | EU15 | NUTS 3 | | Structural fund period |
| | A Agricultural, fishery, rural development | | | | | |
| | S Social integration, human resources | | | | | |
| | C Basic infrastructure, European cohesion | | | | | |
| Structural Fund spending and regional performance | Low Spending - High Performance | 2.2.1 | EU15 | NUTS 2 | | Structural fund period |
| | Low Spending - Medium Performance | | | | | |
| | Low Spending - Low Performance | | | | | |
| | Medium Spending - High Performance | | | | | |
| | Medium Spending - Medium Performance | | | | | |
| | Medium Spending - Low Performance | | | | | |
| | High Spending - High Performance | | | | | |
| | High Spending - Medium Performance | | | | | |
| | High Spending - Low Performance | | | | | |

| Spatial types | Spatial classes | TPG responsible | Spatial scope | Regional level | | Year |
|--|---|-----------------|---------------|----------------|--|------------------------|
| Structural Fund spending and change or regional performance ranking | Low Spending - Rise in Ranking | 2.2.1 | EU15 | NUTS 2 | | Structural fund period |
| | Low Spending - Stable in Ranking | | | | | |
| | Low Spending - Fall in Ranking | | | | | |
| | Medium Spending - Rise in Ranking | | | | | |
| | Medium Spending - Stable in Ranking | | | | | |
| | Medium Spending - Fall in Ranking | | | | | |
| | High Spending - Rise in Ranking | | | | | |
| | High Spending - Stable in Ranking | | | | | |
| | High Spending - Fall in Ranking | | | | | |
| Sectoral Economic structure in the Candidate Countries | Regions with large agriculture and low to medium employment density | 2.2.2 | ACC12 | NUTS 3 | | |
| | Regions with medium agriculture and low employment density | | | | | |
| | Regions with low agriculture, mostly strongly industrialised and low to medium employment density | | | | | |
| Regional conditions based on potentials and bottlenecks | Capital cities/major urban agglomerations | 2.2.2 | ACC12 | NUTS 3 | | |
| | Western border regions | | | | | |
| | Peripheral eastern and rural regions | | | | | |
| | Old industrial regions | | | | | |

| Spatial types | Spatial classes | TPG responsible | Spatial scope | Regional level | | Year |
|----------------------|---|-----------------|---------------|----------------|--------|------|
| Settlement structure | 1 Central Areas in agglomerated regions | 3.1 | EU27+2 | NUTS 3 | NUTS 2 | 2000 |
| | 2 Highly densely areas in agglomerated regions | | | | | |
| | 3 Densely areas in agglomerated regions | | | | | |
| | 4 Rural areas in agglomerated regions | | | | | |
| | 5 Central Areas in densely populated regions | | | | | |
| | 6 Densely areas in in densely populated regions | | | | | |
| | 7 Rural areas in in densely populated regions | | | | | |
| | 8 Rural area more densely populated | | | | | |
| | 9 Rural area less densely populated | | | | | |

Table 31 Revised list of ESPON spatial core types

Further revision and completion of the ESPON Database and selection of core data

At the end of March, 12 projects will have delivered reports including 4 final reports of projects with fundamental input to the core indicator and core typology lists (1.1.4, 1.3.1, 2.2.1, 2.2.2).

Concerning the indicators, the final results of these reports will be an appropriate starting point for updating the ESPON database and the detailed check of update possibilities and the future elaboration of a handbook of data collection and management. Depending on the results of a detailed evaluation, the update cycles could be easily orientated on the update cycles of e.g Eurostat.

A detailed list of indicators will be established to identify the updatable pool of data available for the list of condensed analytical indicators and of potential key reporting indicators. As political needs and demands change, it would not be helpful to define once and for all a list of indicators for reporting. We, therefore, suggest to create such list in an ad-hoc manner every year, based on the indicators available in the general ESPON pool. This list will be elaborated based on a compromise between current feasibility and the political need.

Concerning spatial types a further completion and revision to identify the list of 'real' ESPON core typologies covering spatial structures will be elaborated on the broader base of final ESPON results including the compilation of a short internal 'typology dictionary', synthesising the main inputs, outputs and possible uses of the individual ESPON core typologies.

Further outlook and propositions

- proposition of key indicator selection strategy (in coordination with project 2.4.2)
- continuation of evaluation of core indicators and typologies
- continuation of maintenance of ESPON Database and Map Kit (including integration of new NUTS geometries)
- check of relevant copyright issues (Eurostat and Eurogeographics) and possibly proposal for free data strategy

Chapter 6 Work programme until the Third Interim Report

Scenario building

- completion of thematic prospective scenarios, notably through territorialisation of results
- validation of these scenarios by the ESPON community (MC, ECPs, Seminars) and by the expert panel
- integration of thematic scenarios into multi-thematic scenarios
- first drafts of proactive, roll-back scenarios in collaboration with the ESPON Monitoring Committee

MASST

- finalisation of database
- first parameter estimations of the model
- model runs in support of the qualitative scenarios
- first cross-thematic scenarios

KTEN

- definition of indicators for the thematic transport scenarios and their introduction as parameters into the forecast models.
- consolidation of both models (interfaces, explanation of the parameters, etc.)
- execution of the models for each of the scenarios
- analysis of the results

ETCI

- further analyses of health expenditures (and possibly other social indicators) at the regional/local level
- validation by the ESPON Monitoring Committee
- (if validation) propositions for further versions of the composite index

LTDB

- collection and integration of target data (section 3.2.1.2.1 - Definition of target data to be collected)
- testing and improvement of database
- elaboration of maps on the basis of target data, also in support of scenario building
- elaboration of proposition concerning a project on the elaboration of a historical dictionary of territorial units

Communication

- validation of the results, both within ESPON and outside through contacts with the expert panel
- dissemination and information about the results to a wider public of policy makers at different scales, in coordination with the overall ESPON communication strategy and with the ECP network.
- presentation of scenarios at national/regional level in TPG members' countries (and elsewhere if financially possible)
- improvement of K&C tool, adding new interesting links, metamodels of demographic, economic, energy, emissions perspectives, and add the java mapping tool with the results from the models (to visualize regional tendencies, for example)

Scientific Coordination

- proposition of key indicator selection strategy (in coordination with project 2.4.2)
- continuation of evaluation of core indicators and typologies
- continuation of maintenance of ESPON Database and Map Kit (including integration of new NUTS geometries)
- check of relevant copyright issues (Eurostat and Eurogeographics) and possibly proposal for free data strategy