

ET2050 Draft Final Report
Scientific Report

VOLUME 1
QUALITATIVE SCENARIOS

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1. Introduction

1.1 Aim

The aim of this report is to present the narratives of the ESPON ET2050 Scenarios

The ESPON ET2050 project started in 2011. In it participate 13 consultancy and academic institutions from 10 different countries, is lead by MCRIT (Barcelona). Full information on ongoing works is available at www.espon.eu, and ongoing works at www.et2050.eu.

Results presented in this synthesis follow up the First and Second Interim Reports reviewed by the ESPON Coordination Unit. They are not final, and remain open to be discussed and refined and completed for the Final Report due in June 2014.

1.2 Background

Until 2008 an increasing cohesion between countries and between regions (NUTS 2 and NUTS 3) was observed at European level, even if inside some countries we also registered a decreasing regional cohesion.

During the economic crisis, from 2008 until 2013, disparities are increasing not only within countries but also between countries and between regions in the European Union.

A fundamental question to be answered is, therefore, to what extend the cohesion process observed before crisis was sound and sustainable over time, and what was the actual impact of the Cohesion and Structural funds. Either the crisis is temporary and the previous catching-up dynamics will be restored sooner or later, or the crisis reveals deeper structural weaknesses hard to be solved, and increasing disparities at regional and national level are to be expected at least for the coming decade.

In any case, in their way out of the crisis national economies are becoming more competitive and open to global markets, each one trading with different regions in the world for different sectors, and the increasing trade with emerging markets is producing increasing spatial polarisation in large metropolis and main gateways. All together, in the crisis aftermath European policies will likely be reformed to be more effective, avoiding the risk and the associated costs of possible political fragmentation.

The note concludes briefly discussing a number of policy recommendations; while some of them confirm previous policy-analysis¹ others provide new strategic insights, not always in agreement with the current policies.

1.3 Methodology applied

A period of economic and political crisis is a period of turbulence and uncertainty, where future-oriented studies have trouble even defining consistent enough baseline trends. Already existing forecasts become obsolete very fast, and new forecasts can be soon discredited by new events. Europe is now changing much faster than our capacity to adapt our previous expectations. In this context, our goal is not predicting how the future will look like in ten or fifteen years, but also exploring alternative possible scenarios useful to support a high-level policy debate on strategic

¹ Sapir's and Barca expert reports, Cohesion reports, Green paper of Territorial Cohesion, and recent long-term European Visions (e.g. Transport and Energy Roadmap, PostCarbon Cities Roadmap...), and prospective studies (e. g. the "European Renaissance" scenario proposed in the Global Europe 2050).

European policy reforms, particularly Cohesion policies, as well as to contribute to the design of an ideal long-term vision for the European territory.

The methodology applied is based on five successive steps:

- First, the Present Situation is studied, in relation to sectors most relevant to spatial development (e.g. demography, economy, transport, land use and environment) and considering the territorial diversity of Europe.
- Second, a Baseline scenario is defined by assuming no significant changes in current policies, available technologies and social behaviour. In a period of deep economic crisis, it is unavoidable that such a Baseline scenario becomes rather pessimistic in terms of economic growth, given the trends of the latest five years, and the nature of current macro-economic policies. The Baseline scenario is one of most likely futures for the coming few years, but it is also one of the less likely in the long run, because policies, technologies and behaviours will change, one way or another.
- Third, three alternative prospective scenarios (A, B and C) were defined for 2030 and also 2050, in order to support the discussion of a normative scenario, or Vision, as a most desired future for 2050. Scenarios are defined combining socioeconomic and technologic framework conditions together with different territorial strategies. An strategic policy evaluation is being carried out on the alternative territorial scenarios, in relation to their relative contribution to paramount goals (e.g. competitiveness, cohesion and sustainability).
- Fourth, taking the scenarios as reference, a Vision for the ideal situation of the European Territory in 2050 will be defined in a participatory process involving the ESPON Monitoring Committee and other relevant stakeholders (e.g. the European Commission, the European Parliament and the Committee of Regions) to be carried out during September-December 2013. To facilitate this process, the three A, B and C scenarios are combined with three extreme framework conditions more or less optimistic in terms of productivity increase because of new technologies (scenario variants 1 and 2) , and energy costs (scenario variant 3). The nine scenarios (A1,A2, A3, B1, B2, B3 and C1, C2, C3) define the boundaries in which the Vision for the European Territory in 2050 is discussed,
- Fifth, policy reforms needed to achieve the Vision will be defined and proposed as final recommendations, to be presented in February 2014.

The scenario-building process is supported by foresight models that were refined to take into account the present situation: MULTIPOLES² (Demography), MASST3³ (Economy), MOSAIC⁴

² MULTIPOLES (developed by IOM, Varsow) is a cohort-component, multistate, hierarchical population projection model, capable to model population and labour force (by sex and 5-year age group) for multi-country, multiregional systems or for multi-ethnic systems. It can be used to produce projections, simulations and forecasts of complex hierarchical population systems and to analyse the impact of various scenarios concerning migration, fertility, mortality and economic activity on population and labour force size and structure. MULTIPOLES was specifically designed to model the impact of three categories of migration: internal, international within the system (e.g. within EU) and from outside of the modelled system.

³ MASST (developed by Politecnico di Milano, Milano) is an econometric and macroeconomic partial equilibrium model. In the frame of ET2050, MASST model has been upgraded in-depth. Version 3 of the model includes public expenditure growth rates (based on the relative difference between deficit/GDP ratio and stability pact targets), innovation rates (function of human capital and R&D intensity), urban growth (function of traditional and unconventional urban benefits and urban costs, e.g. quality of life, social conflicts...), and regional unemployment growth (dependant among others on labour market, structural funds policies, FDI). The MASST upgrade allows also to explicitly take into account fiscal policies and the impact of the current economic crisis.

⁴ MOSAIC (developed by MCRIT, Barcelona) is an integrated modal split and assignment model originally applied to TRANS-TOOLS trip distribution matrices. MOSAIC has been upgraded to generate future transport demand based on regional increases of GDP and population. MOSAIC is designed to analyse the impact of alternative transport policy-scenarios (pricing, taxation, infrastructure, fleets...). MOSAIC integrates modal split and traffic assignment in one so the modes do not compete to carry trips but contribute to form multi-modal chains, and modal split is the end result of the process, not the starting point. MOSAIC is built upon a multimodal transport graph integrating road, rail, air and ferry networks, for Europe and its neighbourhood.

(Transport), METRONAMICA⁵ (Land Use), as well as SASI⁶ (Integrated Spatial Development), all disaggregated at regional and/or local scale. Other more aggregated cross-sectorial meta-models (TV+, PASH+) cover the rest of the world, by macro-regions.

5 METRONAMICA (developed by RIKS, Maastricht) is a dynamic and spatially explicit cellular automata-based land use model that allocates regional land use demands to local grids. The model is used for scenario studies, policy analysis as well as research projects. It has been applied worldwide. Applications include stand-alone versions as well as integrated systems (such as Xplorah, MedAction and WISE) that include the METRONAMICA land use model.

6 The SASI model (developed by S&W, Dortmund) is a recursive simulation model of socio-economic development of regions in Europe subject to exogenous assumptions about the economic and demographic development of the European Union as a whole and transport and other spatial policies. The SASI model differs from other approaches to model regional development by modelling not only production (the demand side of regional labour markets) but also population (the supply side of regional labour markets)

2. The European Baseline

2.1 Approach⁷

A Baseline Scenario is a projection of current trends in absence of neither new policies nor unexpected events. It should strive to generate consensus, with other baseline scenarios previously developed to be a useful reference. A Baseline Scenario will not likely comply with most official political targets, and therefore it can be understood as a realistic future ahead, especially in the short and mid term. A baseline scenario is neither the “worst-case” scenario, nor the “most likely future”.

The Baseline Scenario could be understood as a future evolution with no dominant drivers:

- no “technologic panacea”: Neither technology nor free markets are the solution
- no “Invisible hand”: spontaneous behaviour does not result in social self-organisation
- no “political reforms”, but small adjustments

The ET2050 Baseline Scenario sticks to the principles of smart, sustainable and Inclusive growth as the leitmotifs of European policies, and is built on the baseline scenarios developed in EU policy documents and recent studies. The European territory must be explicitly included in the scenario narratives in two complementary senses: as territorial impacts (passive factor that generates externalities) as well as territorial conditions (active factor that induces development).

The ET2050 Baseline Scenario is a structural description of the European territory, concentrating in particular changes in the following thematic areas: demography, economy, technology, energy, transport, land-use, environment and governance, and their independency with territorial dynamics.

The ET2050 Baseline Scenario assumes as starting hypothesis a Sluggish recovery pathway for the 2010-2020 period⁸.

⁷ The methodology of development of the Baseline Scenario included the following research activities:

- internal expert consultations and debates by ET2050 partners carried out in the Second TPG meeting in Brussels, to discuss a first draft Baseline Scenario (19/20-03-2012)
- analysis by sectors and macro-regions, carried out in the ET2050 project (see all reports at www.et2050.eu, 20-04-2012 version)
- elaboration of the Present State and Trends analysis
- analysis of ongoing debates on policy reforms in Europe
- identification of Critical points of Bifurcation or alternative evolutions in response to major challenges anticipated for key sectors based on the present state of Europe and historical evolutions
- comparative analysis of existing baseline scenarios developed in European studies as well as at World scale
- definition of baseline assumptions or Key Directions of the Baseline Scenario based on possible responses to critical bifurcations. Validation through participatory process
- quantitative analysis made with TV+ and PASH+ meta-models, that provide for a number of relevant indicators aggregated at EU level (April 2012) to be used as hypothesis for models.
- quantitative modelling (at NUTS3 or NUTS 2 level) using forecast models
- analysis of territorial differences: providing explanation to territorial dynamics: drivers, seeds, trends, limits and patterns.

⁸ ÖIR et al (2011), *Regional Challenges in the Perspective of 2020 – Phase 2: Deepening and Broadening the Analysis*, EC DG Regio.

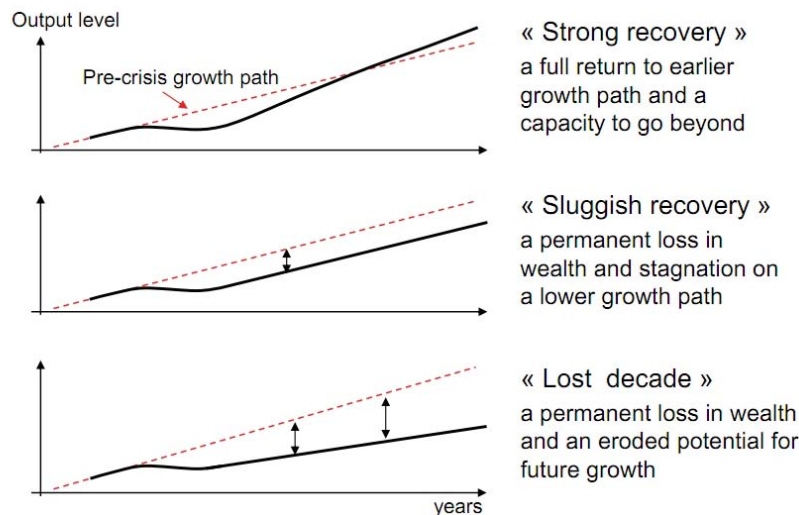


Figure 1 EU2020 Scenarios (JM Barroso, Informal European Council, Feb'10)

2.2 The Baseline faced to Critical Bifurcations

Critical Bifurcations are points or questions where the definition of scenarios takes a choice and generates a particular future along a specific timeline. Different choices in these critical bifurcations lead to different futures. The Baseline is just one of these scenarios.

Next, 10 Critical Bifurcations are presented to define the Baseline Scenario, complemented by 15 additional complementary bifurcation.

1) Will European national economies⁹ be able to adjust to structural transformations?

Dealing with the economic crisis and increasing economic growth rates. The economic crisis has significantly decreased the income of most European countries and increased unemployment (up to 10% in many countries, and more than 20% in Spain). To recover, it will be necessary at least some years of sustained growth, which will require structural transformations.

The Baseline assumes that structural transformations, requiring policy reforms beyond business-as-usual are not carried out as required. Therefore, economic growth is low and unemployment remains high, especially in Southern countries.

2) Will migrations continue to be necessary in Europe to shirking labour market?

Dealing with a shrinking labour market. Population changes are the main driver of employment rates in most regions. Average participation rates tend to be reduced in Europe, among others due to the increasing number of retired people in the higher age cohorts. The ageing of European population will reduce both the active population as well as the average rate of participation. External migration will be necessary to maintain economic growth. But other regions such as North America, Australia, and most developed Asian countries will also compete for the global migration as their populations get older.

⁹ European countries refers to ESPON space.

The Baseline assumes that net international extra-European migration will be growing slowly, especially coming from Ukraine or Belarus, Arab Countries, former colonies, as well as from southern and south eastern Asia. Migration will be attracted mainly by cosmopolitan centres and urban agglomerations.

3) Will European countries be able to sustain their welfare system?

Dealing with World-wide competition without abjuring the European labour market model and welfare state. The European society is characterized by higher levels of public welfare with respect to almost all the rest of the world, which means higher services but also higher expenditure for health care and pensions. These costs translate into higher taxes on labour and capital. At the same time, the European labour market model is in many cases little flexible, with workers which either do the same job until the retirement age or fall into unemployment. Young people, in particular, find it difficult to find a regular job to enter this protected labour market. In order to be able to sustain its welfare system and labour protection, European countries will need to foster labour productivity, otherwise production and services will be off-shored.

The Baseline assumes that the public welfare system will be reduced, and its management more privatised, forced by public financial constraints. There will be a process of harmonisation across European countries along these lines.

4) Will Europe (and its single countries) be able to find ways to finance its public debt?

Dealing with stretched public finances. The expensive welfare state, as well as the poor efficiency of many public administrations together with an emerging political populism, already made Europe a relatively indebted continent, but this situation has worsened with the economic crisis, so that now almost all countries have a significantly larger burden of public debt on GDP. Some countries are already experiencing difficulties in re-financing maturing debt. For this reason tight public finances, better public management, and coordination between countries will be needed in order to maintain the debt sustainable.

The Baseline scenario assumes that financial debts will remain as a permanent burden for most European countries; even if future public expenses are reduced and debts are better managed, debts will not be significantly reduced. Each country will still stand alone for its own debt, increasing the costs for all.

5) Will Europe be able to compete with emerging countries in high-value sectors?

Dealing with a different competition from rising powers. The European economy used to compete with their products against the firms of other OECD countries such as the US or Japan. The earlier competition from China and the Asian tigers but also from Brazil and India, was on the contrary based on cost competitiveness on lower value added products. This pattern has already changed. Emerging economies are increasingly active in high-tech sectors and products, and this will increase in the future so that European economies will need to compete against younger countries also in these sectors, by trying to maintain and renew the technological advantage they still have.

The Baseline scenario assumes that European technological advantages will be progressively reduced overtime, since emerging markets will be able to adapt and integrate new technologies easier than European countries; therefore, hardly European companies will not be able to compete in new sectors.

6) Will Europe be decarbonised and decentralized energetically, reducing GHG emissions?

Dealing with energetic transition. Primary biomass in European Countries may grow from 180 Mtoe in 2010 to 300 Mtoe in 2030 (EU25), especially in Poland, Spain, Italy or UK. The transition towards a society free from fuel energies will last for some decades, or two generations. In this transition, a large number of alternative sources of energy will emerge. The share of renewable energy sources is already increasing but still remains far from EU targets. As Northern European countries are more involved than Southern ones in the development of renewable energy sources, they contribute better to the GHG emissions decrease. Even if a large increase in renewable energy is expected in Europe, especially in wind, solar and biomass (RES could account in 2030 18,4% and 26% in 2050), the rising of these sources will only compensate the decrease in hydropower. Grid energy storage will be commercially introduced to store electricity on a large scale within an electrical power grid. Transport emissions, accounting today for more than 20% of GHG emissions, will mostly remain stable due to the fact that increasing transport demand largely counter balances the impact of improvements in fuel efficiency and fuel shift.

The Baseline scenario assumes that fossil fuels will still be the most important energy sources, despite the important increase in RES, and a decrease in GHG emissions even though targets will not be met, and a gap will develop between Northern and Southern Europe contribution to improvement.

7) Will Europe will be able to tap the untapped potential of its regional diversity richness?

Dealing with internal income disparities. Income disparities between countries and even more between regions will grow. The resources devoted to the compensation of these differentials will be scarce in the foreseeable future, and not effective enough. For this reason Europe will need to find a way to enhance the endogenous potential of its regions if it has to achieve overall growth. Cooperation between European cities is weak and competition is strong.

The Baseline scenario assumes that disparities will grow in Europe, as they are growing in the rest of the World. Inequalities at local or regional level will become more dramatic than at national level. Public support to less developed regions will become more scarce and will produce limited, sometimes even contradictory, effects.

8) Will spatial development and settlement structures be more polarised?

Dealing with Territorial Cohesion. Europe has the highest population density (60 persons/km²) of any continent. Of the total European population 73% lives in urban areas against 69% in 1990 and 55% in 1950, but southern Europe is far less urban (67%) than northern Europe (83%). The urbanisation process is expected to continue, up to 80% urban population in European countries in 2030 and even 89% in 2050, resulting in even denser urban environments than today. In the meanwhile, many rural and sparsely populated areas lose out along this process, in human capital and activities. In Eastern Europe this process will result in much larger urban centres than today, than in Western Europe where the distribution is to remain largely constant since area is already much urbanised. The current debate on territorial cohesion is concerned with integrating relevant policies and actions, requiring well-established democratic institutions and adequate responses to the demands of technical systems and markets. In the context of Europe 2020, the question is whether this EU strategy will remain mainly a matter for Directorate Generals and their various clients pursuing their policies, or will Cohesion policy, with its more integrated and decentralised approach involving many levels of government and stakeholders, form platforms for integrating them.

The baseline assumes no relevant policy reforms taken over the next decades, with a continuation of the urbanization process and the development towards larger urban centres, and increased territorial unbalances.

9) Will be Europe politically more integrated?

Dealing with different national interests. Since its foundation, 27 States have become part of the European Union, integrating today a population of more the twice its original. The European model has changed forever with the expansion towards the East in the years 2000s, doubling the number of countries and embracing nations that are substantially poorer in comparison to former partners. Governance will become more complex and so will be the culture mix. Europe evolves towards a “Multi-speed” governance, based on the Open Coordination Method, with countries retaining much of their power. The more adaptative countries and regions are able to move on quickly than others which stay as laggards.

The baseline assumes no significant advancement of European political integration, in a more complicated and variable institutional geometry.

10) Will decision and management processes of EU key policies be more decentralised?

Dealing with improved governance. The EC White Paper on Governance urged the Union to renew the Community method by following a less top-down approach and complementing its policy tools with non-legislative instruments. The White Paper aims at increasing the involvement of citizens in the European policy, empowering local actors to a higher extent and considering spatial, environmental and socioeconomic issues altogether in an integrated approach. At the same time, an increasing mismatch between social and economic flows and administrative and current political boundaries is taking place, territorial jurisdictions introducing rigidities in service provision, fund allocation and policy building. New planning and territorial cooperation initiatives are needed, open to networks of public and private institutions, and attached to add-hoc geographies (e.g. cross-border regions, mountain zones, coastal zones or islands, river basins, remote or sparsely populated regions ...). Policies should increasingly emerge in the future by the initiative of local communities putting accent on good governance and strategic thinking.

The baseline assumes that EU governance will still be mostly top-down, and that the territorial decentralisation of decision and management processes and the empowerment of local communities will remain limited.

The next points (11 to 25) complement the 10 key critical bifurcations, aiming at providing greater precision in the definition of the Baseline.

11) Will be European countries able to re-qualify its aging labour force?

Dealing with an aging population and workforce The European population is aging very fast, second only to Japan. This implies that the workforce is increasingly old, and that workers in their 50s or even 60s will need to be re-trained and qualified for new economic jobs. Moreover, due to the demographic trends (life expectancy growing from current 79 to 85 in 2050, and fertility rates well below 2,1), the old-age dependency ratio will more than double in the European countries (from current 22,4% to 58,1% in 2050), so that it will become important to maintain workers into the labour market until older ages.

The Baseline scenario assumes that the level of qualification of the labour force will increase at a very modest level, and labour productivity will be lower than in USA and emerging economies.

12) Will be Europe able to put in place a “smart growth” as suggested by the Agenda 2020?

Building a more innovative economy. The only way to foster productivity for advanced economies passes through innovation, but despite the efforts by the individual countries and the EU, the innovation effort is still not high enough. Moreover, the competition for the most qualified human capital has become global too, which makes it important for Europe to be able to retain and attract the highest skilled workers and researchers, by offering them not only good quality of life but also job satisfaction opportunities.

The Baseline scenario assumes that “smart growth” as such will mostly happen in Northern and Central European countries, while Eastern European countries will tend to be more focused on manufacture and Southern countries have a mixed economy, with an increasing importance on low-added value services, such as mass-residential tourism, and some more added-value services such as tourism linked to health, education and business.

13) Will be Europe able to create and take advantage of a demand from emerging countries?

Dealing with lower demand. The US, which is still the largest buyer of European goods and services, will probably remain in a situation of weak demand for the years to come, so that the European economy, which cannot rely on the public sector to create demand, will need to find other demand sources. This should be found in the same emerging economies which have increased their exports towards Europe in the last two decades. These emerging economies, in fact, have already started increasing the disposable income of their citizens, and European firms have to try and find a way into these rapidly expanding markets.

The Baseline scenario assumes that European firms will struggle to be able to maintain the actual level of exports to emerging markets, excepts in sectors where competitive advantages exist and can be maintained; emerging markets will tend to keep foreign imports low, or increase the relative trade among themselves.

14) Will trade continue to grow World wide at a higher ratio than GDP?

Maintaining a relevant position in global trade. World trade has grown between 1991 and 2011 at twice the rate of economy, almost 6% yearly on average (WTO, 2012). The volume of exports in the World between 1950 and 2008 multiplied by 32 times according to UNCTAD (in volume, tonnes), for a growth of global GDP of just 8 times. Container traffic emerged since the 90s, and represents today one sixth of total trade (went from TEU25 million in 1990 to TEU160 million in 2008, and is forecasted to rise to TEU375 million by 2020). However, since the trade collapse of 2008-09, the world economy and trade remain fragile and a further slowing of trade is expected in 2012 showing that the downside risks remain high. Developed economies exceeded expectations with export growth of 4,7% in 2011 while developing economies (including CIS) did worse than expected, recording an increase of just 5,4%.

The Baseline scenario assumes that European trade will continue to grow in the coming decades driven by intra-European trade, and because of the growth of emerging economies, even if Europe is likely to lose some shares in this global framework.

15) Will tourism continue to grow World wide at a higher ratio than GDP?

Managing international tourist flows. Since the 1950s, tourism has experienced continued expansion and diversification becoming one of the largest and fastest growing economic sectors in the World. Tourism is responsible for 5% of the world's GDP, 6% of total exports and employs 1 out of every 12 people in advanced and emerging economies alike. In spite of occasional shocks, international tourist arrivals have shown uninterrupted growth: from 25 million in 1950, to 277 million in 1980, to 435 million in 1990, to 675 million in 2000, and the current 940 million. Even in 2011, international tourist arrivals grew by over 4%, according to UNWTO, in a year characterised by a stalled global economic recovery, major political changes in the Middle East and North Africa and natural disasters in Japan. Tourist arrivals to Europe reached 420 million in 2011 (more than 500 million including Russia) accounting for almost half of World tourism, but the fastest growth is in the emerging regions where the share in international tourist arrivals has steadily risen from 31% in 1990 to 47% in 2010.

The Baseline scenario assumes that European tourism will continue to grow in the coming decades even if Europe is likely to lose share in the global framework.

16) Will intra-European migrations grow?

Experiencing fewer migratory tensions. In the last decade the intra-European international migration (i.e. between EU Member States) was dominated by East to West flows, related to work. Retirement related migration to sun-sea-sand areas played important role in the Mediterranean, but these flows are strongly affected by current economic conditions and could also move to Northern African countries and more remote areas. Internal migration (i.e. within EU Member States) was dominated by inflows to urban agglomerations.

The Baseline assumes that intra-European international migration will slightly decrease and internal migration will remain on the current level. The differences in the attractiveness of various regions and in regional migration gains and losses will be much lower than those in the past.

17) Will long-distance freight transport be decoupled from transport growth?

Growing global freight traffic. If global GDP doubles between 2005 and 2030 (from \$47 billion to \$92 billion), world maritime container traffic could increase by more than 6,0% per annum, air freight could increase by around 5,9% per annum and rail freight traffic worldwide could increase at around 2,5% per annum. On this basis air freight could triple in 20 years, and port handling of maritime containers worldwide could quadruple by 2030. Transport prices will continue to go down relative to the value of goods because of more efficient technologies (larger vehicles, more efficient management...), even if higher environmental taxes are somehow introduced. Increasing concentration of transport operators at global scale.

The Baseline scenario assumes that freight transport in Europe will only increase at the projected economic growth rate, resulting only in an 80% increase between 2010 and 2050, that is a 1,5% annum.

18) Will long-distance passenger growth be decoupled from economic growth?

Growing long-distance passenger traffic. Worldwide passenger traffic would grow on average 5,1% yearly. To meet this increased demand for air transportation, the number of airplanes in the worldwide fleet will grow at an annual rate of 3,6%. The traffic would grow at an average rate of 4,8% yearly between 2010 and 2030. Globally, the single biggest traffic flow will be the

US domestic market with 11.1% of all RPKs flown, while intra-Western European traffic, with its well established global and low cost carriers, will be the third largest flow with nearly 8% of World RPKs. The Chinese domestic market is forecast to grow at more than 7% per annum, moving it from the fourth largest flow in 2010 to the second by 2030.

The Baseline scenario assumes that long-distance will not be decoupled from economic growth, and both will grow in parallel.

19) Will urban transport be decoupled from economic growth?

Dealing with congested urban environments. Commuting transport is growing the least in Europe, and long distance the most. The number of trips by person made in European cities will tend to become more stable, even if GDP continues to grow, and their purposes more divers. Individual transport modes (e.g. walking, riding a bike, or a motorbike, an small private car) will not be significantly reduced, replaced by collective transport modes.

The Baseline scenario assumes that in congested urban environments, urban transport will tend to be stable, independent of economic growth.

20) Will be Europe able to put in place energy efficiency?

Establishing an energy efficient economy. While energy efficiency improvements are widespread over the coming decades in the World, total energy use is still projected to grow strongly at global level. Over the next twenty years, global energy demand will increase by around 40%, and double by 2050, with the vast majority of the growth coming from non-OECD countries such as China and India. Most of the growth in energy production is located in developing regions, which are projected to substantially increase their share in global production for the coming decades. Energy dependency in European countries is to increase, 59% in 2030 and 65% in 2050, compared to 54% in 2005. The price of energy will not decrease due to the rising of demand from emerging economies which will compete for the same resources and commodities; hence energy efficiency will be needed also for pure economic reasons.

The Baseline scenario assumes a tendency towards more energy efficiency and a moderate transition to renewable energy sources, below the levels assumed by European targets in force.

21) Will be Europe able to take the lead in the green economy sector?

Dealing with the challenges of global warming. Reducing emissions will probably entail higher costs for European firms, which will make them less competitive in the short-term, *ceteris paribus*, with respect to countries where regulations are less ecologic. At the same time, this challenge could bring long-term opportunities if Europe could establish itself as a forerunner in green technology.

The Baseline scenario assumes that long-term potential competitive advantages will not compensate certain short-term costs. Environmental regulations, applied to current markets and existing technologies, will not be cost-effective, all considered.

22) Will be European agriculture more competitive?

Dealing with local and global agriculture. Europe is one of the World's largest and most productive suppliers of food and fibre (21% of global meat production and 20% of global cereal

production in 2004). 36% of European land is dedicated to agriculture. The productivity of European agriculture is generally high, in particular in Western Europe: average cereal yields in the EU are 60% higher than the global average. In 2008 European countries had around 22% of the total area cultivated organically in the world. Global food prices are growing in real terms, as a result of growing world population, rising affluence, and the shift to Western dietary preference. Competition for agricultural land with biofuel production may raise food prices as well (between 4% and 18% of EU's agricultural land will be needed to produce the amount of biofuels to reach the level of liquid fossil fuel replacement required for the transport sector in the Directive 2003/30/EC).

The Baseline scenario assumes an increase of local markets sensitive to ecological higher quality. The "buy local" movement takes hold both based on environmentalist but also protectionist motivation.

23) Will land-use patterns become more hybrid due to ineffective planning?

Dealing with increasingly mixed land-uses. Urban planning is stagnated and unable in many areas of the World to give adequate response to growing population. In some areas, new construction in urban areas has not kept up to demand, so crowding and sprawl to the surrounding suburbs is apparent. Many regions have developed residential tourism economies supported by extensive real estate operations in a general tendency towards more relaxed land regulations and increasing land occupation, except in Northern countries with strict spatial development regulation. New residential developments will mostly be located on agricultural areas.

The baseline scenario assumes continuity in the trend towards increasing "Middle Landscapes" largely composed by fuzzy urban-rural zones. Inland water bodies will remain attractive for new residential development in South-eastern Europe and Western Europe, and so will be marine water bodies in Mediterranean and Western Europe. Agricultural areas close to cities are likely to be taken over by suburbanization. The area of forests is likely to expand while the area for grassland is likely to decrease.

24) Will governments become more corporative?

Dealing with higher governance tensions. Future governance in European Countries will be driven first by the type of societal value system we will be living in (more inclusive or more exclusive), and second the kind of response by political and societal institutions (partial or complete, proactive or reactive). Public sector still represents today 40% of the European economies. There is a limited capacity to streamline public institutions. The public debt of most countries remains above 50% of GDP. More public private partnership initiatives are expected. Increasing financial problems in European countries on public services related to social expenditures.

The baseline assumes a weaker institutional framework will result in higher influence of corporate interests in public governance.

25) Will Europe become more spatially integrated?

Dealing with the integration of different European territories beyond political borders. Since the adoption of the ESDP, there has been a necessity to develop a more functional approach to European integration, based on enhanced policy integration and coordination between different types of territories (e.g. metropolitan areas, cross-border areas, transnational regions, urban-rural relationships). This emphasis on spatial integration is based on two main arguments.

First, it has become evident that regions and territories are increasingly interdependent in terms of socio-economic growth and welfare development: in order to sustain these interdependencies, EU policymakers have developed policy initiatives and mechanisms supporting further spatial integration. Second, a better policy coordination and integration both between sectors and between territories may lead to substantial savings in public funding (i.e. avoiding unnecessary redundancies in public investments) and create stronger socio-economic leverages due to larger and more targeted investments. However, the difficulties encountered to find the right balance in territorial governance adjustments may seem daunting in an era requiring swift and transparent decision-making structures. Social integration is still weak in Europe. Only 2% of Europeans live and work in other European countries. Cross-border short-distance flows of people remain marginal, despite cooperation initiatives. International relations between European countries grow less than could be expected, given the geographic proximity and the common market.

The baseline assumes no significant advancement will be made when it comes to spatial and cross-sectoral integration, with the mere continuation of existing structures and initiatives.

2.3 Key Directions of the Baseline

The World Context

From 1990s the World has experienced accelerated changes in terms of demographic growth, information and communication technologies and information flows, integration of global financial systems and increase of global trade, and tourism, emergency of Asian economies, and increasing oil prices.

Energy consumption will likely grow in the near future, and CO₂ emissions, even if there is a significant market shift towards renewal energy sources and decentralised and distributed grid systems, and electric and hybrid vehicles market share grows significantly worldwide. Oil price may likely grow, even though it seems unlikely a shortage ahead, because of increasing taxation and more expensive extraction.

While economic disparities at world level have been reduced because of the emergency of new economies, and standards of living, knowledge and literacy are spread worldwide, social and regional disparities have mostly grown precisely in China, the Russian Federation, India and even Brazil, countries that displayed the greatest disparity in GDP per capita in 2007. Also in USA and many European countries social disparities have increased largely because salaries have not always followed the growth of the economy, and corporative profits, in the latest decades. Moreover, in the “financial global capitalism system”, corporative profits have been increasingly decoupled from productivity and attached to expectations wherever they may be emerging around the world.

The urbanisation process has been accelerated and the number of large metropolis have grown worldwide, not much in Europe. We have seen the fast development of the so-called “Space of Flows”, a “Networked Society” that blurs political borders, diminishes the power of Nation-States and, in many aspects, subverts geographic distances: neighbouring places became distant and remote locations much closer if well connected to just-in-time communication networks. The world is not flat, however, and distance still matters: people and corporations become global and still wish to stay local. Therefore, local and global scales become more and more relevant.

Figure 2 World Framework 1950-2010 and projections 2010-2050 – Table of exogenous variables

Indicator	1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050
World Population (millions of people)	2.531	3.039	3.708	4.473	5.308	6.125	6.910	7.670	8.323	8.889	9.214
World Urban Population (% over total population)	29%	33%	36%	39%	43%	46%	50%	55%	59%	64%	69%
World illiteracy rate (% of population 15+)	44%	41%	37%	30%	24%	18%	17%	14%	11%	9%	7%
World Gini Coefficient (Income Disparities)	0,63	0,64	0,65	0,66	0,66	0,66	0,64	0,63	0,63	0,62	0,60
World GDP (1000 millions of 2010 €)	4.501	7.422	13.535	19.367	26.411	34.214	43.338	60.565	84.638	106.888	134.986
World total trade (goods& services in 1000 million €)	125	178	479	2.250	5.625	13.027	19.947	36.060	65.189	100.272	154.236
Global seaborne traffic (billion tone-km)	4.862	7.197	10.654	16.777	16.440	22.927	32.746	48.472	69.707	100.246	144.163
Global air traffic (billion RPKs)	226	368	600	1.100	2.100	3.381	4.621	7.491	12.145	19.688	31.918
World Tourism (million overnight visitors per year)	25	64	109	170	319	560	940	1.281	1.746	2.379	3.241
World energy consumption (MTOE)	2.900	3.754	4.884	6.469	7.192	8.441	10.182	13.442	17.747	20.758	24.280
World CO2 emissions (million tones)	10.000	11.802	14.908	18.990	21.977	24.224	29.905	38.875	50.537	56.757	63.741
Real crude oil price (€2010 per barrel)	13	12	9	82	33	30	67	108	121	130	138

Source: PASH+ foresight model based on various sources (UNDESA, UNESCO, World Bank, UNCTAD, DRAWRY, AIRBUS, BOEING, WTO, IEA, BP).

Europe in the world: Diminishing world share

Next graphic displays the expected evolution of European countries world share up to 2050¹⁰

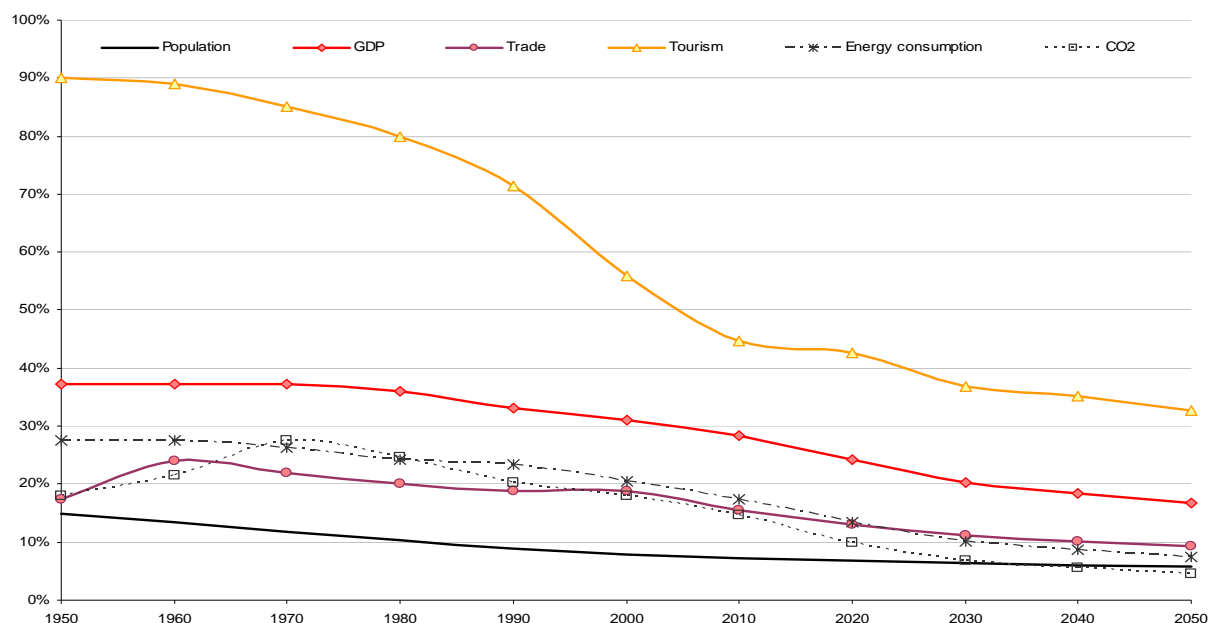


Figure 3 European evolution in relation to the rest of the World 1950-2050 (European share at World level). Source: Multipoles, MASST, SASI, MOSAIC, METRONAMICA and PASH+

¹⁰ It is important to note that even if shares may diminish, in absolute terms there is an overall increase

After the Second World War, European Western economies raised in relation to USA, largely because effective social and economic public policies and strong pro-growth social values, in a catching-up process. At the same time, the European political integration progressed step by step according to the post-war vision of Jean Monet, Konrad Adenauer, and other political leaders of that time. The development of Western European economies in late fifties and sixties was qualified later on as the “European model”..

The economic gap between more advanced Western European countries and the rest of the world has been reduced since mid seventies because of the lower economic growth in Europe. During the last decades this process has increased because of the outsourcing of American and European industrial corporations mostly to export-oriented Asian economies still with very low salaries, as well as the introduction of new technologies in manufacture and services (the so-called “robot sourcing”). Both processes have reduced the number of jobs now available in Europe, keeping the salaries of European workers relatively low in relation to corporative profits, and therefore increasing social disparities. Because of the relatively slow economic growth of the recent years, and the crisis initiated in late 2008, public policies face nowadays increasing financial sustainability problems, in many European countries. The “decline” of the so-called “European model” was first announced in the early 2000s, when the “excess” of social and other expenditures by European public sectors, in relation to the likely evolution of their finances, was first denounced by different analysts. The increasingly old European population, compared to the rest of the world and particularly to Neighbouring Mediterranean countries, and the rigidity of European public institutions and markets, in the eyes of many analysts results in predominant reactive and conservative values leading to a lack of flexibility adopting forthcoming technologic innovations.

The idea of “decline” is not new in Europe. It was already before the First World War, since early 1900s, that the “decline” of Europe and even of the Western civilisation was first announced. At that time, European countries begin to reduce the share of population, economic production, trade and technologic innovation they accumulated during the industrialisation of the 1800s, in the age many historians call “High Imperialism”, with the apotheosis of the dominance of European colonialists powers over the rest of the world.

It is clear that in the years to come the political influence of European national governments and the weight of European corporations will naturally tend to diminish (rather than “decline”) at Global level¹¹. Next graphic displays the long-term evolution since the First Globalisation to present times in terms of world production.

¹¹ This view, pictured a context for the “Relative Decline”, or the “Sweet Decline” of European countries, echoes European thinkers and visionaries from 1900s, when the USA were rising as an economic and military power.

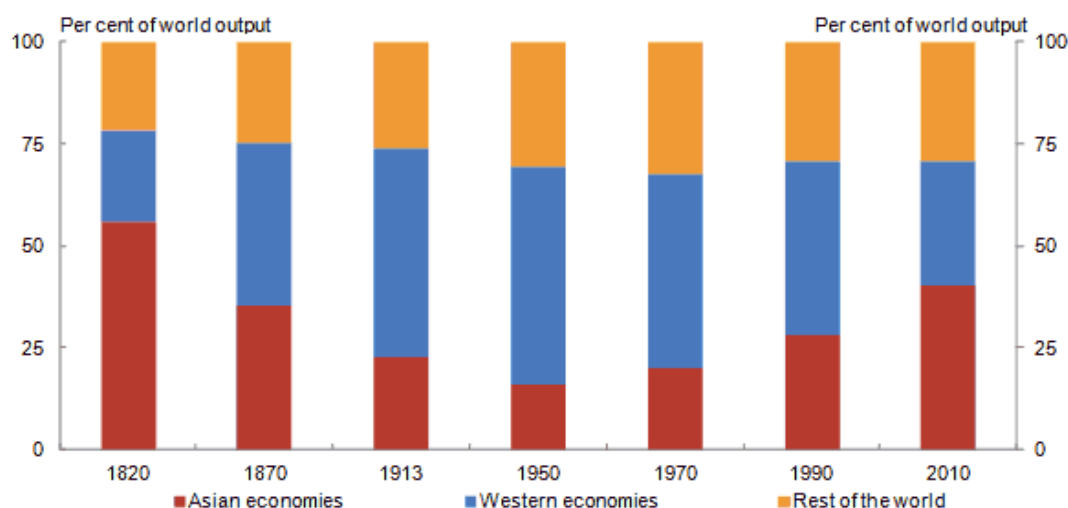


Figure 4 Purchasing parity adjusted Total GDP Source: Maddison (2010) and Conference Board (2011)

Western economies are defined as: Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Sweden, Switzerland, the UK and the US. Asian economies are defined as: Bangladesh, China, Hong Kong, India, Indonesia, Japan, Republic of Korea, Malaysia, Pakistan, the Philippines, Singapore, Sri Lanka, Taiwan, Thailand and Vietnam

Needless to say, the diminishing share of European countries of the world economy does not mean the absolute growth, even in exponential terms, in many areas. The European economies will become, after the crisis, increasingly more interdependent from the rest of the world economies, and foreign investments, trade, migrants, or tourism, that may grow more than in between European countries. This may have profound social and political implications.

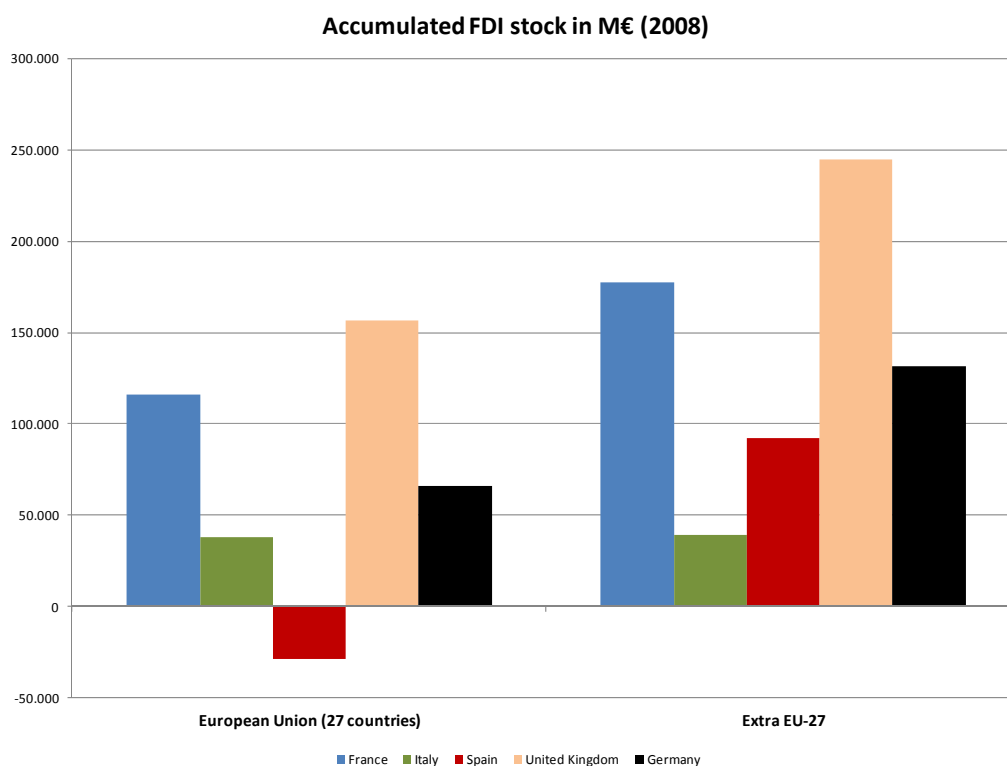


Figure 5 Accumulated FDI Stock in M€ at EU level (2008). Source: Eurostat

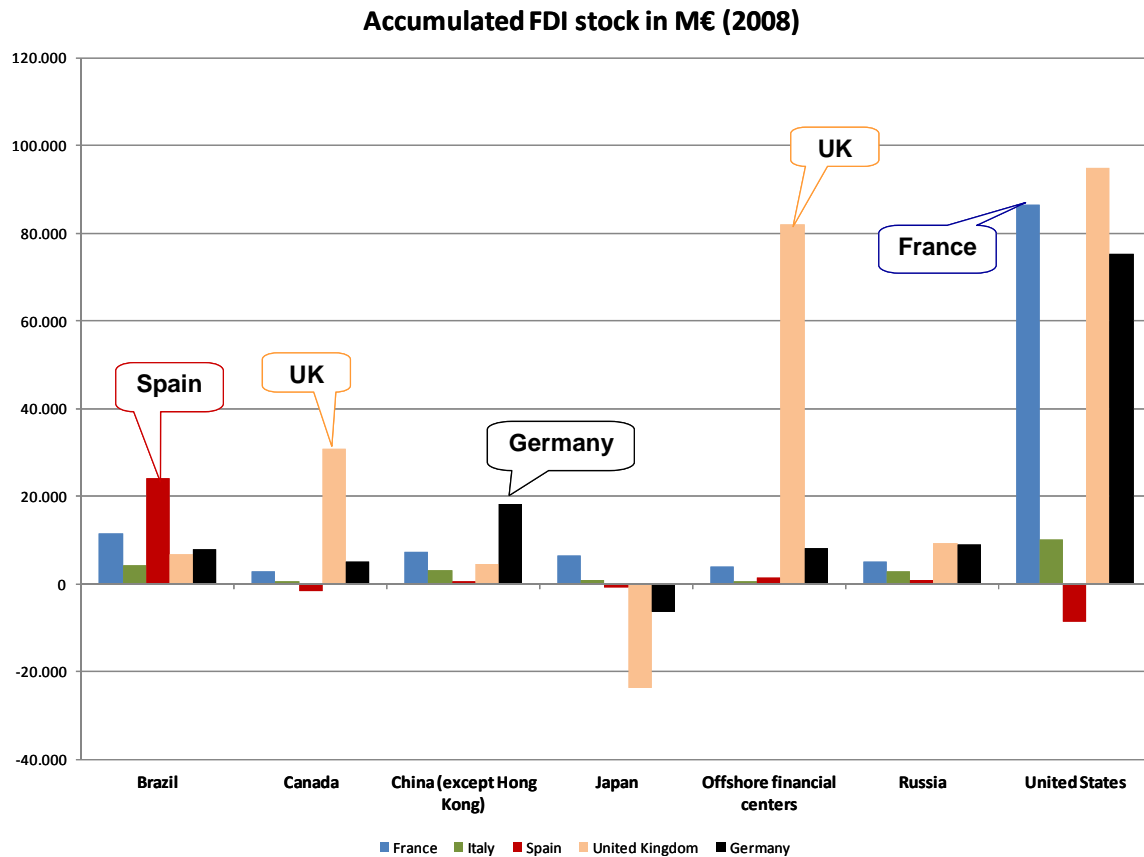


Figure 6 Accumulated FDI Stock in M€ at country level (2008). Source: Eurostat

Next figure provides complementary information to further illustrate the increasing globalisation of the European countries (the same Western countries shown as sample), with international air passengers at similar magnitudes between intra-European and Extra-European.

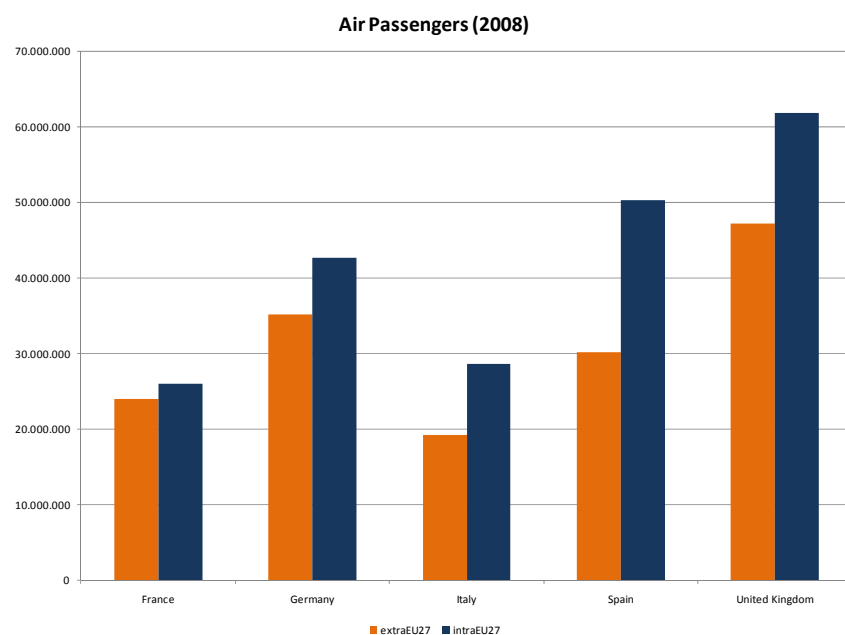


Figure 7 extraEU and intraEU air passengers at country level. Source: Eurostat

Europe Present State: Across the Great Recession

The present financial crisis, then economic, social and political, is maybe the worse European economic crisis in half a century. EU Council President Herman Van Rompuy warned that the eurozone and the European Union itself were fighting for survival as a result of the ongoing sovereign debt shocks. Nationalism and populism grow both in Southern countries, with economies in recession and large percent of unemployment especially among young's, as well as in France or in UK, to some extend in Hungary, and some Northern countries like Finland. The way the old successful "European model" is being perceived by citizens of different regions and countries inside the European Union, but also in Neighbouring countries is dramatically changing.

The roots of the actual crisis in Europe, and the Western economies, are often presented as follows:

- The financial, and then economic crisis, lead to dramatic public financial unbalances. Countries running with surpluses and relatively low debts have seen deteriorated their situation in just five years. By some experts, these financial crisis only triggered a much more serious concern of world financial markets on the sustainability of European public expenditures. Or it is just, by other analysts, the last episode of the successive, each one worse than the previous one, inherent to the capitalist global economy.
- The crisis is very having different impacts in different countries and regions, further increasing economic divergence, and different countries have different, even opposite interests, concerning the measures to be taken at European level, and their level of urgency.
- The fundamental weaknesses of European policies have been revealed, mostly in relation to Monetary stabilisation, banking and private debt control, and Fiscal harmonisation. Also in relation to the difficult situation of less developed countries in recession, unable to implement internal devaluation and facing speculative induced tensions in financing their so-called sovereign debt.
- In relation to Cohesion policies, relevant hidden trends in the 1990 and 2000s years are becoming more visible, such as the increasing trade gap among European countries, the unsustainable growth of private debt fuelled by easy lending, as well as other well-known unbalances in public finances and the Real Estate Bubble in many Cohesion countries.
- European strong austerity and monetary policies are nowadays almost unique at world level (e.g. compared with Japanese and to some extend American monetary policies), and many analysts blame them to be responsible for worsening the economic situation. However, other analysts alert in relation to the urgency to keep public debts in order avoiding a Public Debt Bubble that will be far more dramatic than any other.
- Economic Disparities among countries and regions have grown 2008-2013, to the point that the relative convergence in the previous decade is maybe lost.
- ECOFIN and IMF forecasts for the few coming years show the difficulties of most European economies to recover to a previous situation, and the lasting impacts of the crisis particularly in Cohesion countries.
- As a result, social welfare has been reduced, both because higher unemployment, lower salaries and public cuts on social expenditure. The growth in the hidden economy (up to 22% in some countries) and social networks, often family based, become more important.

Based on the performance during the crisis of regions and countries considered successful cases of catching-up economic growth, the narrative of the successive Cohesion reports, and probably Cohesion policies, may need to be reviewed¹².

Recent ECOFIN¹³ studies affirm that in the euro area the convergence process appears to have stalled a few years after the inception of the euro. This essentially reflects, always according to ECOFIN studies, a poor growth performance of catching countries in productivity. Catching-up processes in the euro area were benefited from large inflows of foreign capital in pre-crisis years. However, the observed capital accumulation pattern does not seem to have been conducive to rapid technological change and productivity growth. More worrying, ECOFIN also affirms that there is also evidence of capital misallocation, with the accumulation process becoming gradually less economically efficient during the first decade of the euro.

Imposed by the strong austerity policies, and therefore the lack of capacity of governments to increase public investments, as well as by the low levels of domestic consumption, European economies are nowadays increasing their exports to the rest of the world. Next graphic, for Germany, shows a pattern that is to some extent common to other European economies: stagnation of intra-European imports and exports, and increase in extra-European exports.

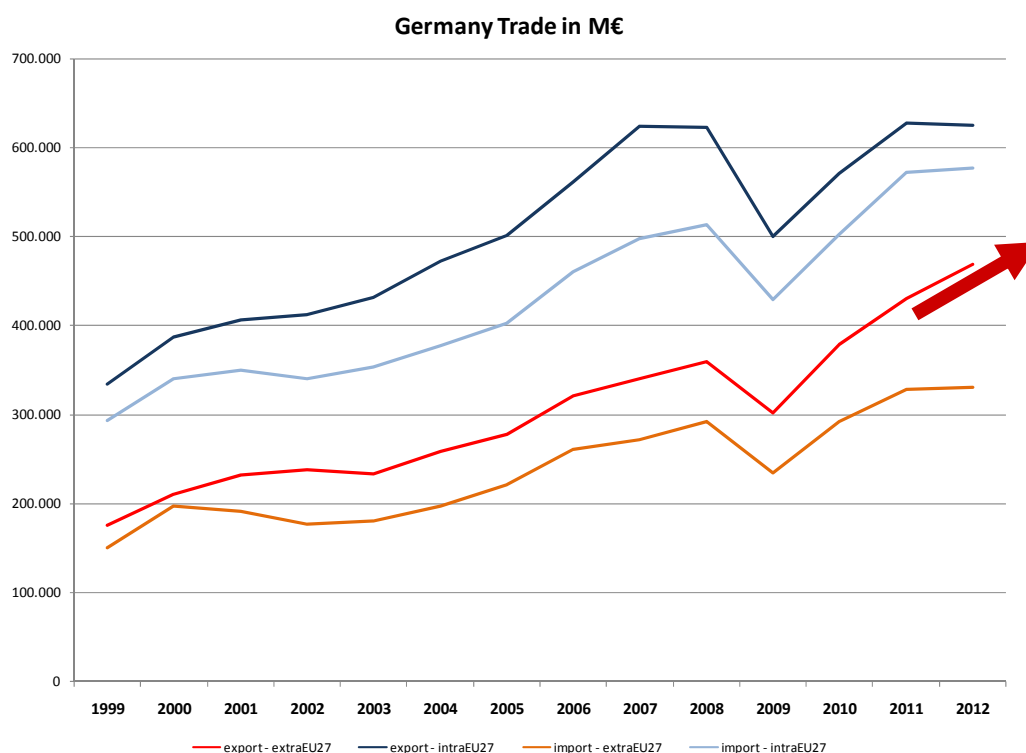


Figure 8 German trade intraEU and extraEU 1999-2012. Source: Eurostat

¹² It is true that EU achieved impressive economic and social convergence since 1988. At national level, Greece, Spain, Ireland and Portugal – the largest beneficiaries of Cohesion Policy in recent years – have experienced significant growth. Between 1995 and 2005, Greece reduced the gap with the rest of the EU-27, moving from 74 % to reach 88 % of the EU's average gross domestic product per head. By the same year, Spain had moved from 91 % to 102 %, and Ireland reached 145 % of the Union's average starting from 102 %. It was expected similar results in the new Member States, where Cohesion Policy has just begun to take effect, underpinning the high growth rates. At the level of the regions, relatively strong economic growth of those with a low GDP per head has meant that EU regions have been converging. Between 1995 and 2004, the number of regions with a GDP per head below 75 % of the EU average fell from 78 to 70 and the number of those below 50 % of the EU average declined from 39 to 32.

¹³ Quarterly Report on the Euro Area, Catching-up processes in the euro area. DG ECOFIN based on EU KLEIMS

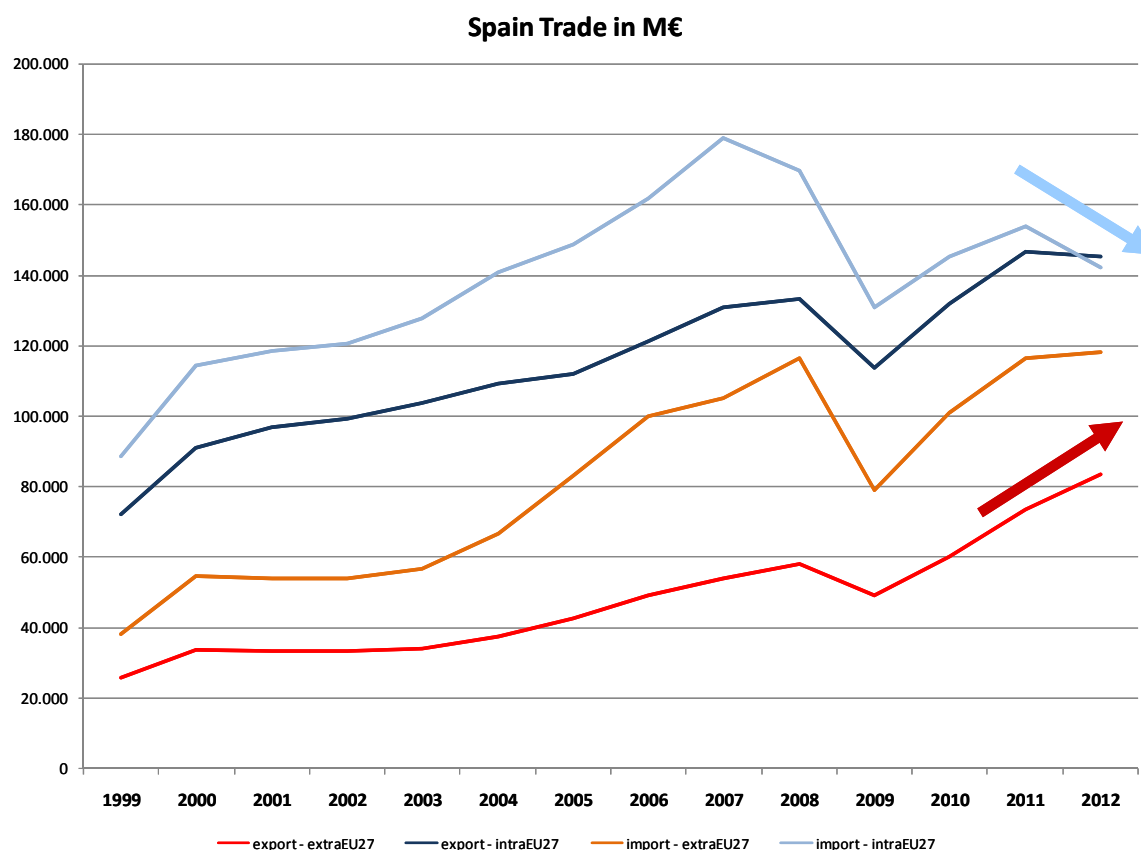


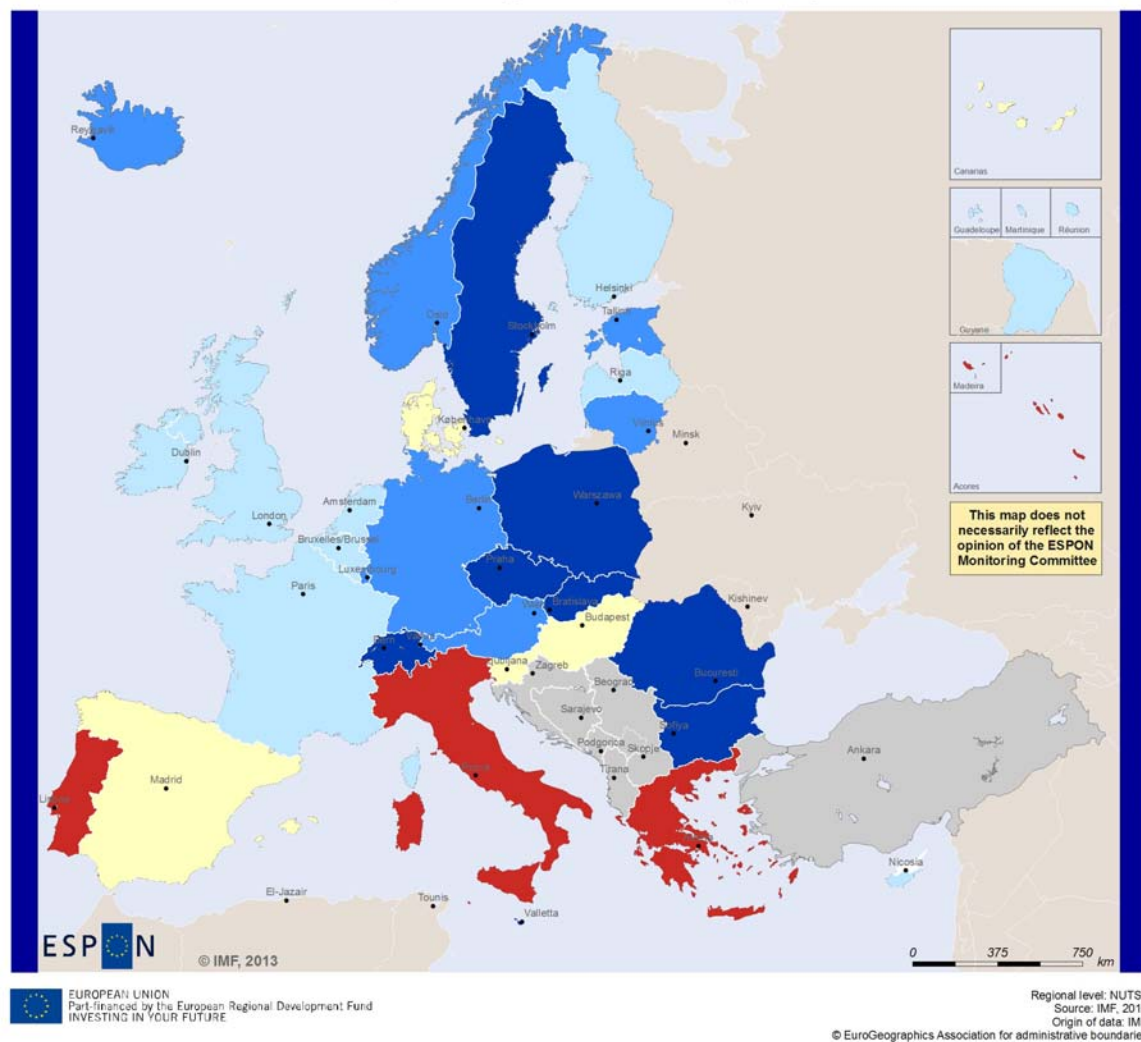
Figure 9 Spanish trade intraEU and extraEU 1999-2012. Source: Eurostat

In the case of the corporations located in Spain, together with the increasing exports to the rest of the world, there is also a clear pattern to reduce intra-European imports. The rapid growth of imports from Europe and from outside Europe since 2003 to 2008, was not supported by increasing productivity gains and exports, but by an increase of private debt, in part induced by the Real Estate Bubble, facilitated by easy lending from the international financial system.

Next map presents the most recent forecast produced by IMF for the European economies up to 2017.

GDP Growth 2008 - 2017, 10 years period (Source: IMF 2013)

Measured as annual average GDP growth rate along the period



GDP Growth annual average rate (Units: %)

Results obtained by IMF

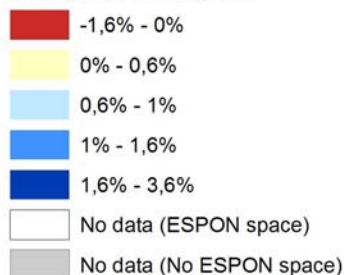


Figure 10 GDP annual growth rate 2008-2017. Source: IMF 2013

Needless to say, even if pessimistic views are nowadays overwhelming, there are also analysts, like Marco Buti and Karl Pichelmann¹⁴, pointing out that Europe has a more than fair chance to

¹⁴ European prosperity reloaded: an optimistic glance at EMU@20, By Marco Buti and Karl Pichelmann (19th Brief, February 2013)

leave the crisis behind in a much stronger overall world position than before. Deep reforms at national and European level, they say, including the establishment of a banking union, will allow for significant gains in dynamic allocative efficiency, fostering intra-area convergence and retaining Europe's strong competitive position in the global economy. European well-developed social systems, smartly recalibrated, continue these experts, will be an asset in the post-crisis world, paying-off in terms of more economic stability and sustained growth, and the strengthened medium-term fiscal framework to put public finances back in order will generate fiscal space to tackle new challenges and enable automatic stabilisers to work; a task yet to be addressed in other advanced economies.

In relation to Cohesion policies, it is clear that they will have to somehow be adjusted to the new social and economic conditions created by the crisis, and the increasingly globalised and divergent European economies. Cohesion, rather than only a question of co-financing building missing infrastructure to increase social fixed capital or providing subsidies to local entrepreneurs, seems to require a more comprehensive approach with common monetary and fiscal common policies being able to be sensitive to less developed regions and countries, as well as to promoting in-depth institutional reforms, as well as better territorial planning and governance. On the other hand, future Cohesion Policies will also have to face future challenges such the ageing society and the sustainability of the welfare systems, the capacity to developed or implement technologic innovations, as well as to reduce fossil energy dependency. These well-known challenges will likely have very different positive or negative impacts according to the regions specificities. Local and regional governance issues will likely play a decisive role in regional development.

Moderate Growth and Increasing Regional Disparities

Since 2008, the growth and convergence process of the previous decade suddenly reverses. Southern countries, larger recipients of Cohesion and Structural Funds in the previous decade, reduced GDP: around 10% in Spain and Italy, more than 20% in Greece; at the same time, Central and Northern countries remain stagnant or had small growth (e.g. less than 5% in Germany). Eastern European Countries had different evolutions, some of them growing at moderate level, like Poland, as well as other countries after carrying on drastic fiscal reforms, like the Baltic countries. At regional level, we see much faster growing disparities than before; while in new member states capital regions are the winners, while rural and eastern border regions are the losers.

Under the baseline assumptions, a continuation of the present situation for the next 15 years is expected: moderate economic recovery together with increasing national and regional unbalances. The average annual grow for Europe¹⁵ is about 1,89%, but 44 regions grow less than 1% or have negative growth. While more developed countries grow because of productivity increases, less developed countries growth is due to job creation, only possible because a reduction of salaries in real terms. It is not the conventional picture of the "slow economic decline of Europe", but a picture of "overall growth with increasing disparities".

Assuming that the general economic recession lasts until 2015, the Baseline indicates that most Nordic and Central regions will have an annual growth above 2%, and most Southern European regions will have very low growth rates, below 1%, and some even negative average rates, particularly Greek regions and few Spanish inner regions. In most Eastern European regions

¹⁵ "Europe" is in this note defined as the 31 countries integrated in the ESPON Program.

average annual growth is not higher than the European average, and therefore the catching-up process of the previous decade does not continue¹⁶.

Results on Southern and, particularly, in Eastern regions are rather disappointing. The main reason for the results in Southern regions is due to the hard impact of the crisis, and the sluggish recovery projected afterwards; concerning Eastern European regions, demographic projections indicate a net decline in their active population mostly because continuous labour migration to Western countries; this relatively important population reduction would constrain the overall economic growth if there is no a high-enough increase in productivity, and will likely concentrate it only in large cities.

Long term forecasts and studies by public institutions, such as the International Monetary Funds, OECD and EC/ECOFIN, or by private consultancies and research institutes like PWC, do not always deliver more optimistic pictures than the ESPON Baseline, even if they do not necessarily consider the same assumptions and therefore are not exactly comparable. The IFM forecast for 2017, for instance, indicates smaller or negative growth for Southern countries and higher growth in Eastern regions, for 2017, fully consistent with the ESPON results for 2030 assuming an sluggish recovery for these regions; even if most economic forecasts indicate that the catching-up process of Eastern economies will continue to the next decade, many of them (e.g. the PWC for the world in 2050) also indicate that this process may slow down progressively later on, ending in 2030.

More Jobs and Lower Salaries

The very large unemployment level in many European regions will keep driving salaries down in real terms for the years to come, and will also induce labour migrations towards more developed and ageing regions, with much higher salaries.

More jobs are expected to be created in Europe, overall, if the actual trend towards lower salaries will continue for the next decade. Employment will therefore grow in most European regions, even in regions with low or negative economic growth, where growth will result for by an increased workforce rather than by higher productivity, similarly as it happened in many Southern regions with high immigration from 2000 to 2008.

Jobs will be created in both the manufacturing and service sectors across Europe. A relative reindustrialisation is expected in traditional industrial areas in the centre of Europe, recentralising high-quality and technologically advanced production, as well as in Southern regions where salaries will remain low making already existing industrial investments profitable enough to remain there longer, delaying delocalisation plans towards Eastern regions, but to a less extend

¹⁶ Taking as a sample the evolution of just four countries, the results can be easily exemplified.

Denmark is expected to grow at a sustained 2%, and hence above European average. This outcome is expected, since Denmark has an strong local economy well connected globally, a healthy, inclusive and well educated society, with good governance.

Germany grows at European average, after restructuring its economy in the previous decade, with increasing exports to the rest of the world and assuming high immigration from the rest of Europe to balance its shrinking workforce.

Spain grows at about 1%, therefore less than the European average, with many regions having negative annual economic growth. Spain's future evolution looks uncertain to most analysts, and there are both indications of a healthy recovery (e.g. the growing exports to emerging markets and the reduction of private debt, the public sector reforms) but also of a prolonged recession (e.g. the high unemployment, particularly among young people, the large hidden economy).

Poland grows at the same ratio of Germany, so following the European average. The moderate overall growth in Poland, and other Eastern European countries provided by MASST3 is unexpected, but understandable assuming a continuous lost of population in Eastern European countries, with migration from rural sparsely populated areas to large cities, and to western regions. Unless productivity rises very high in these regions, above most expectations, the decreasing work force will likely mean lower economic growth in average and increasing disparities among large cities and rural peripheries.

towards emerging markets. A net increase in the service sector is expected in Eastern regions, clustered in main cities.

Ageing Population

Ageing is the most universal trend across European regions, because the continuous increase in life expectancy, increasing to 81 years for men and 86 years for women in 2030 and to 85 years for men and 90 years for women in 2050. The number of elderly people tends to grow. Even if the retirement age will likely be postponed from 60 or 65 to 70 years old, the workforce will shrink in many countries, leading to increasing migration from other European countries as well as from non-European countries. Because of ageing, the workforce in some countries will shrink in the coming years, e.g. 6,5 million people just in Germany in the next decade. The most relevant trend is the decline of population in Eastern rural areas.

Demographic components follow heavy inertias; while fertility converges world-wide (total fertility rate (TFR) will slowly increase from 1.61 to 1.66 in 2030, and then remain stable), life expectancy keeps growing, and therefore migration is the key uncertainty both in terms of labour and non-labour. It is assumed that until 2030 extra-Europe immigration will increase by 2 per cent every 5 years, afterwards it will be constant. In the most crisis-hit countries the increase will be delayed by five years. Since no major policy changes in demographic policies across Europe are expected, the number of immigrants will be growing slowly to respond to the labour shortage related to the aging of Europe.

Even if data concerning non-labour migration, such as residential tourism is scarce at European level, it is known that in Southern regions migration due to residential tourism attracting retired persons will grow (some 800.000 people in the Spanish Mediterranean coastal regions, with a significant variation over the year), being a positive social and economic development driver of health and other advanced personal services.

More Labour Mobility

Migration is still low in Europe, among countries and within countries, as well as from other non-European countries, in comparison with the USA, that also has a much younger population. Migration in Europe is expected to grow because of ageing, as well as because of economic reasons: if less developed countries do not catch-up more developed European countries, they will not be able to offer better jobs and higher salaries to most of their population, fulfilling the wellbeing expectations of their population. Labour migration from less developed Eastern rural regions to Central regions, and to the larger industrial and service sector in Eastern countries is therefore likely to happen unless a change on technologies (e.g. a significant increase in "robot sourcing") or policies. The volume of the labour migration flows East-West and South-North can be a serious threat to societies and economies of a number of countries, for Lithuania for example, that can loose a significant part of their population. Since migrants are usually young people, migration will also have a dramatic impact on age structures.

Migration will also affect skilled people attracted to large global cities in search of better job opportunities, in this case from all over Europe. Migration from the rest of the world, especially from Neighbouring countries will also grow, if non restricted by policies, to work in regions with relatively large agriculture, construction or tourism sectors.

Increasing and More Diversified Globalisation

In their way out of the crisis, European economies are moving to increase their trade with world emerging economies, although still at a relatively low pace. Different from many European

countries, the world is now experiencing economic growth, particularly in new emerging economies, as well as a gradual convergence in main demographic components, leading to the overall reduction of poverty and the increase of more affluent middle classes.

Companies located in different European countries and economic sectors are taking advantage of the growth of emerging markets differently, based on pre-existing social, economic and cultural links (e.g. UK with US and Commonwealth countries, Poland and Eastern regions with Russia and former URSS republics, Portugal with Brazil and few African countries, Spain with Latino America...).

The relative reduction of imports from the rest of European countries, and the increase of exports to the rest of the world will make European foreign policy even more difficult, since global national interest may easily diverge. Spatial polarisation in main European gateways and large metropolis will likely continue.

More Polarisation in European Gateways

Transport infrastructure deficits constraining economic growth still exist on Eastern European regions. However, in most Southern regions infrastructure investments on long-distance Transeuropean networks have been very high in the previous years, largely because of Cohesion and Structural Funds, to the point that infrastructure endowment is one of the main assets for future development, even if local and regional infrastructure still presents deficits and the infrastructure actually build often was not cost-effective.

Given the scarcity of public funds, investments in transport will be reduced from 1,04% of EU GDP in total transport investment to 0,73% (about 1.900 billion up to 2030 in total, with 330 billion allocated to TENs, 60% of the required investments to complete the networks). Modal allocation is expect to follow the same criteria now established, not always assuring a minimum economic profitability level to large infrastructure investments. A significant increase on maintenance, and communication technologies is expected. Vehicle emissions are expected to be 30% lower in 2030, with a limited increase in taxation.

Transport demand will increase following the economic growth. No decoupling neither for freight nor passengers for any trip purpose and long-distance travel, only for urban mobility in more developed regions.

The number of intercontinental flights from major airports and maritime routes from ports will become increasingly important development assets. European major gateways for passengers and freight transport to the neighbouring countries and the rest of world will continue to expand their capacity to achieve even higher economies of scale, requiring specialised connections from the rest of the territory, either dedicated freight lines or High-Speed trains. In this context, some balancing of hub-and-spoke networks may be necessary to achieve a more efficient traffic distribution across Europe (e.g. promoting Mediterranean ports to capture maritime flows from Asia having as a destination the South of Europe, increasing the intercontinental flights from national airports).

Energy intensity (energy consumption elasticity in relation to GDP) is expected to decrease due to more service oriented economies and increased energy efficiency. Carbon intensity (GHG emissions elasticity in relation to energy consumption) is expected to decrease due to improved technology.

Logic relationships between trends and key directions for the Baseline

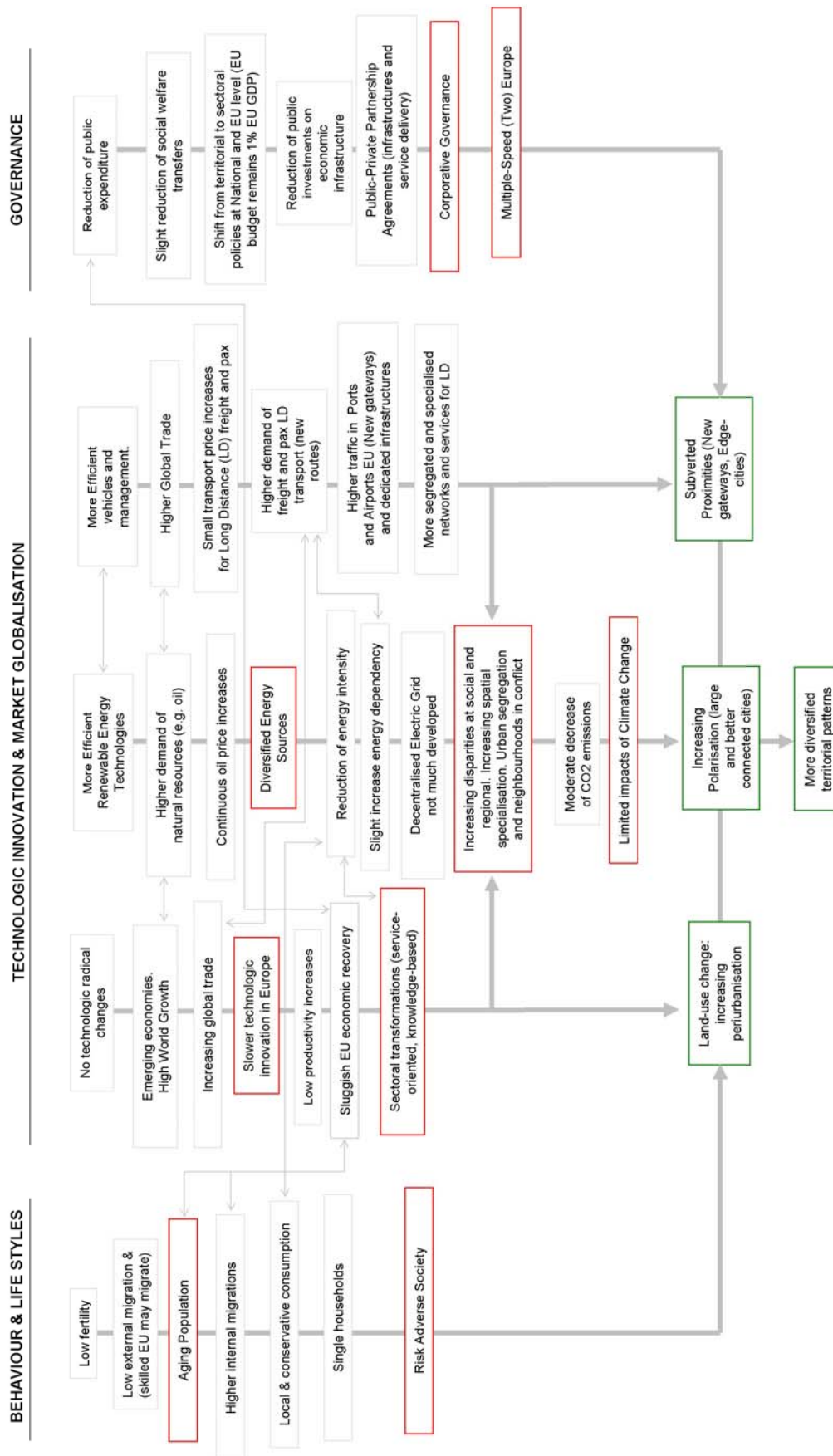


Figure 11 Logic framework for the Baseline Scenario

3. Exploratory Scenarios

3.1 Starting Point: Flows, Cities and Regions Scenarios from Project Specifications

The point of departure are the three Exploratory Scenarios suggested in the Project Specification:

- *Europe of the Flows*. This scenario provides an image of the European territory in which economic and population growth as well as public investments are mainly stimulated to take place within main corridors that structure the European territory. Europe of the Flows is characterised by strong connections between cities and transport nodes. Political focus lies on issues such as enhancing connections and long distance networks and global integration.
- *Europe of the Cities*. This scenario provides an image of the European territory in which economic and population growth as well as public investments are mainly stimulated to take place within existing cities that structure the European territory; cities that have a role as driving forces in the global, national and/or regional level. Europe of the Cities is characterised by economically strong and compact cities. Political focus lies on issues such as intensified use of urban space, strong preservation of open space, reduction of long-distance traffic.
- *Europe of the Regions*. This scenario provides an image of the European territory in which economic and population growth as well as public investments are mainly stimulated to take place on the basis of specific regional identities and strengths. Europe of the Regions is characterised by strong urban and rural territories that form a mosaic of different regions and types of territories with strong identities. Political focus lies on issues such as regional self-reliance, small-scale development and landscape protection.

First sketches of three original scenarios presented in the ET2050 Project Specification were studied and debated in the first TPG meeting in Barcelona. Consistency, likelihood and desirability were tested with specific questionnaires.

Scenarios were adjusted, and a fourth scenario was temporarily introduced to cover a more ecological and local, place-based view. All four scenarios were presented and discussed in the ESPON Krakow Seminar in November 2011. Again questionnaires were distributed among expert participants, and analysis of results revealed a positive increase in consistency, likelihood and desirability of the scenarios.

In the TPG meeting in Brussels in March 2012 a new discussion on Exploratory Scenario assumptions helped to further refine them.

The purpose of the Exploratory Scenarios was based on investigating Territorial Cohesion issues, in terms of how different spatial structures and patterns could influence the social and economic future evolution of Europe, and vice versa. Therefore, the latest revision of the initial scenarios was focused on emphasising *polycentricity* as the key dimension of the scenarios.

3.2 Conceptual framework: Polycentrism at different scales

Polycentricity is the overarching concept behind the Territorial Cohesion goal, from the ESDP to the *Territorial Agenda 2020*, that its first priority says that *promoting polycentric development is the precondition of territorial cohesion and a strong factor of territorial competitiveness*.

Polycentricism, as a concept, is understood at three different geographic scales by the Exploratory scenarios (named A, B, C). Based on the polycentricity concept, the type of regions

to be promoted under each scenario (Metropolitan Global Areas, Cities and Regions) are defined based on population density criteria.

Scenario A (Territorial Strategy: Promotion of Metropolitan Global Areas)

Polycentricity at global scale, to ensure European successful economic competitiveness, the size and agglomeration advantages of **European larger metropolis**, linked to knowledge sharing and technologic innovation, is promoted by National and European policies. Therefore, public policies at European and National level to promote higher agglomeration economies in largest metropolis and transport nodes and corridors (Mega-cities and Mega-corridors, so to speak) or at less removing constrains to their spontaneous growth are foreseen (this Scenario, called A, focused on the promotion of large metropolitan global areas, would be in line with the *Europe of Flows* presented in the Project Specifications). This scenario (in line with the FLOWS scenario from the Project Specifications) provides an image of Europe in which the territory is more dynamic, flexible and adaptable to technological, social and economic change¹⁷.

This scenario follows the *Europe 2020* strategy of promoting global competitiveness of Europe by promoting the economic development of the largest metropolitan areas of global importance in Europe, i.e. of the 76 Metropolitan European Growth Areas (MEGAs) defined in ESPON 1.1.1 (2005, 118). The policies applied are mainly investments in MEGAs supporting of high-level R&D as well as European transport infrastructure, such as high-speed rail, and enhancing connections and long distance networks, favouring more efficient technologies and management strategies.

More integrated trans-national zones emerge by the networking of cities in cross-border areas, and transport and energy corridors link major European centres of production and consumption with neighbouring countries and the rest of the World.

¹⁷ The **A Scenario** is inspired by the work of the following authors. Relevant references provided in each case:

Ascher, François, *Metapolis. Les Nouveaux principes de l'Urbanisme* (2004)
Castells, Manuel, *The Space of Flows*
Bauman, Zygmunt, *44 letters from the Liquid Modern World* (2011)
Dupuy, Gabriel, *Systèmes, réseaux et territoires. Réseautique territoriale* (1985)
García Vázquez, Carlos, *Antipolis*, (2011)
Garreau, Joel, *Edge Cities* (1993)
Hanley, Richard, *Moving people, goods and information in the 21st century. The cutting-edge of infrastructures of networked cities* (2004)
Hall, P., *Megacities, World Cities and Global Cities*, in *Megacities* (2010)
Mitchel, William, *Me+ & e-topia*(2003)
Nijkamp, Peter, *Megacities: Lands of Hope and Glory*, in *Megacities* (2010)
Kasarda, John, *Aerotropolis. The Way We'll Live Next* (2011)
Kunstler, James Howard, *The geography of nowhere* (1993)
Rowe, Peter, *Making a Middle Landscape* (1991)
Sassen, Saskia, *Urban Economics and Fading Distances*, in *Megacities* (2010)
Senett, Richard, *Megacities and the Welfare State*, in *Megacities* (2010)

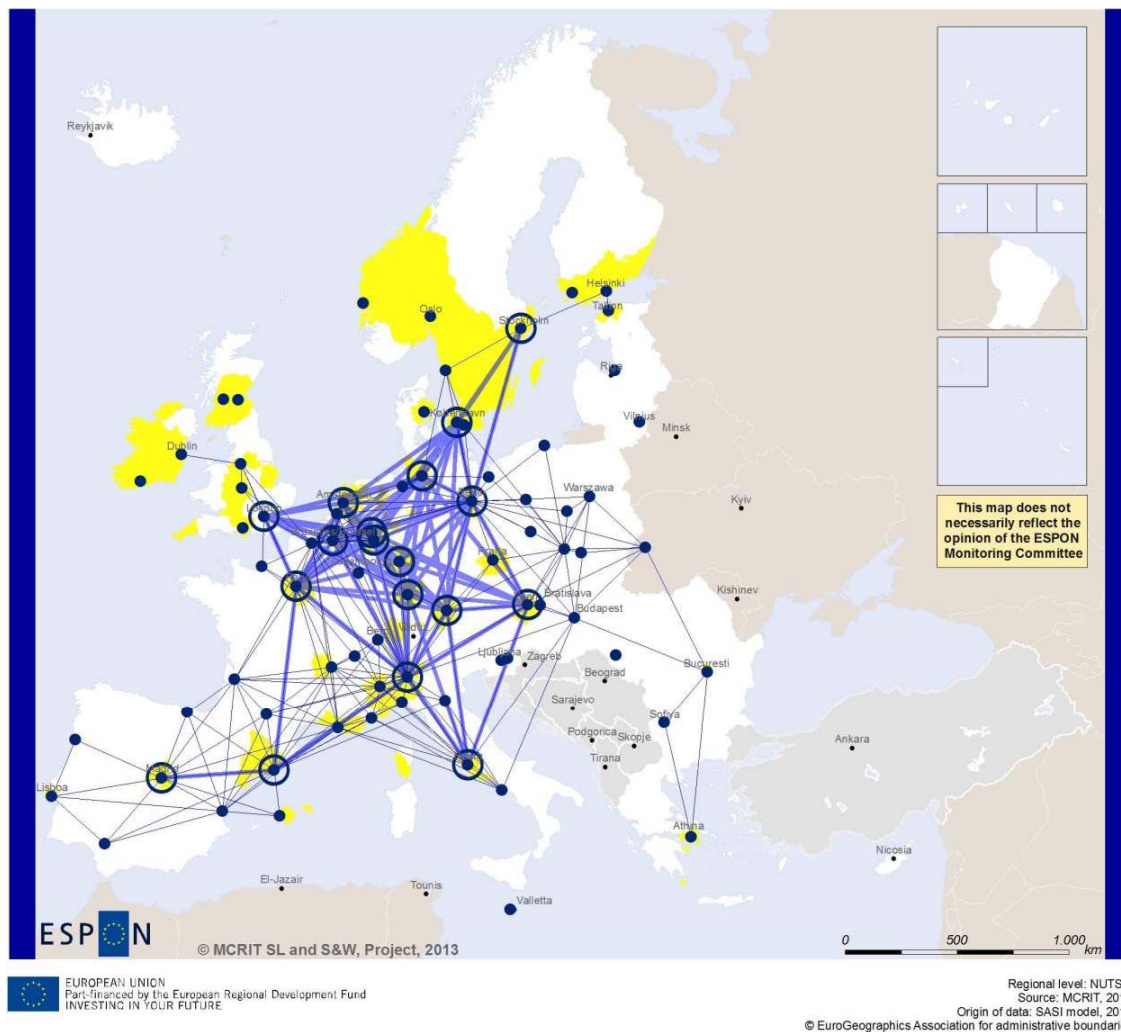


Illustration of Scenario A

Based on results obtained by SASI forecast model (2050)

- MEGA category 1
- MEGAS
- MEGA (category 1)-MEGA (category 1) links and length < 850 km
- All MEGAS- all MEGAS links and length < 850 km (where population origin and population destination/length > 5000)
- Yellow Relative increases in GDP 2051 per capita Scenario A/Baseline average over 50 (100=EU31 ave)
- Grey No data (No ESPON space)

Figure 12 Illustration of Scenario A “Megascities”

Scenario B (Territorial Strategy: Promotion of Cities)

Congestion costs in large and more dense European metropolis will grow more rapidly than in other continents, and the promotion of **urban regions and second rank cities** well connected to global metropolis, as well as to smaller cities and more rural areas, with relatively diversified economic activities, and social inclusiveness, is a preferable political option in Europe, not necessarily producing less economic growth (this Scenario, called B, focused on the promotion of large and medium size cities, would be in line with the *Europe of Cities* presented in the Project Specifications)

This scenario provides an image of the European territory in which economic and population growth, as well as most private and public investments, take place within existing cities that give structure to the European territory: national capitals and major regional capitals as driving forces¹⁸.

It is a place-based scenario that follows the priority of the European Spatial Development Perspective (1999) and the two Territorial Agenda (2007; 2011) for balanced polycentric urban systems at the macro-regional or national scale for the 261 cities of European or national significance defined in ESPON 1.1.1 (2005, 114).

Policies applied are mainly in the fields of Cohesion funds being mostly targeted to cities, including urban renewal and reurbanisation, and R&D investments distributed among cities, and promotion of regional and national transport networks.

This scenario is characterised by economically strong and compact cities as centres of excellence. The increasing concentration of added-value activities in cities does not necessarily implies a process of rural decline, but its increasing functional dependency on large cities.

¹⁸ The **Scenario B** is inspired by the work of the following authors:

Benevolo, Leonardo, *The European City. The Making of Europe* (1993)
Einsele, Martin, *The Upper Rhine, an Alternative Metropolis*, (1988)
Florida, Richard, *The Creative Cities* (2009)
Jacobs, Jane, *Dead and Life in the American Cities*
Glaser, Edward, *Triumph of the City*, (2011)
Rifkin, Jeremy, *The Empathic Civilisation*, (2010)
Ohmae, Kenichi, *The End of the Nation State and the Rise of Regional Economies*, (1996)
Savitch, H. V., *Post-Industrial Cities*, (1991)
Solà-Morales, Ignasi, *Metropolis*, (2005)
White, William H., *City. Rediscovering the Center* (1988)

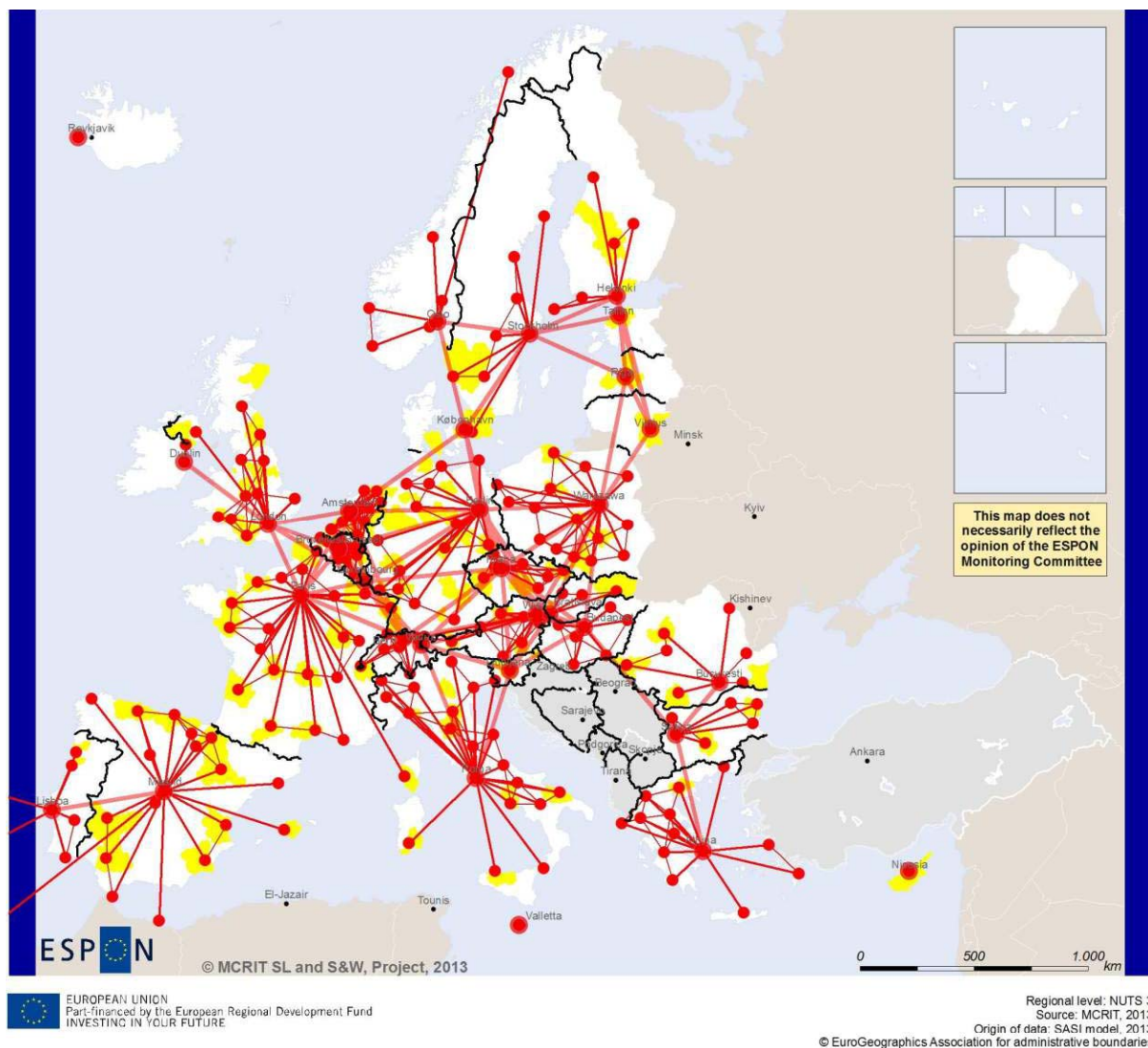


Illustration of Scenario B

Based on results obtained by SASI forecast model (2050)

- Capital NUTS0
- Capital NUTS2 (NUTS1 only Germany and United Kingdom)
- NUTS0 boundaries
- NUTS0-NUTS0 links and length <650km
- NUTS0-NUTS2 links intra NUTS0 (except Germany and United Kingdom)
- NUTS0-NUTS1 links intra NUTS0 (only Germany and United Kingdom)
- NUTS2-NUTS2 links intra NUTS0 and length <200km (except Germany and United Kingdom)
- NUTS1-NUTS1 links intra NUTS0 and length <200km (only Germany and United Kingdom)
- Relative increases in GDP 2051 per capita Scenario B/Baseline average over 100 (100=EU31 ave)
- No data (No ESPON space)

Figure 13 Illustration of Scenario B “Cities”

Scenario C (Territorial Strategy: Promotion of Regions)

Local and regional scales favouring geographic proximity have to be strongly promoted by public policies to support endogenous development and increase economic resilience in a world with increasing economic vulnerability and scarce and more expensive transport and energy, even if this leads to zero growth in the short-term. European Cohesion policies should be targeted to **small and medium-size towns and rural regions**, especially in less developed countries, favouring changes in people and corporative behaviour. This territorial policy will support emerging alternative economic practices such as consumer cooperatives, agro-ecological production networks, social currency networks, seed banks, etc, therefore balancing the strong deterritorialisation trends of contemporary global financial capitalism (this Scenario, called C, focused on the promotion of small and medium size cities, especially in less developed regions, would be more in line with the *Europe of Regions* presented in the Project Specifications)

Scenario C provides an image of the European territory in which urban and rural territories form a mosaic of different regions and types of territories with identities nourished by local and regional governments able to cooperate in areas of common interest¹⁹.

This scenario responds to the challenges of energy scarcity and climate change expressed in the Territorial Agenda 2020 (2011) by promoting small and medium-sized cities as centres of self-contained and economically resilient regions with more sustainable mobility patterns yet taking account of the necessary economies of scale of services of general interest and the prospects of an ageing society.

Policies applied are mainly from the fields of cohesion funds targeting mostly rural less developed areas, and transport investments focused on local and regional networks. The focus lies on promoting medium-sized cities and reducing the existing imbalances at the medium and lower level of the urban hierarchy and their functions for the surrounding regions. Policies aim at organising the settlement systems in a more polycentric approach, economically resilient, at regional scale.

Local production and local markets gain much importance, migration of skilled people from large cities to rural areas accelerates localism, large cities become further decentralized into more productive, slow neighbourhoods. Strengthening the social and economic balance of Europe at the regional level, promoting endogenous development and empowering regional institutions may lead to more efficient provision of public services. Many of the changes in this scenario are much lead by changes of values and behaviour of new generations, policy becoming a support for these.

¹⁹ The **C Scenario** is inspired by the work of the following authors. Relevant references provided in each case

Geddes, Patrick, Regional Planning,
Forman, Richard T.T., Land MOSAICs. The Ecology of landscapes and regions, (1995)
Klein, Naomi, The Shock Doctrine. The Rise of Disaster Capitalism (2007)
Munford, Lewis, The Regional Framework of Civilisation. Regions to live in, (1968) Davis, Mike, Dead Cities, (2002)
Rubin, Jeff, Why Your World is About to Get a Whole Lot Smaller, (2009)
Smith, Neil, ¿Cities after Neo-Liberalism? (2009)
Calthorpe, Peter, The Next American Metropolis. Ecology, Community and the American Dream, (1993)
Illych, Ivan, The Art of Habitat (1984)
Latouche, Serge, Petit traité de la décroissance sereine (2009)
Salingaros, Nikos A., Principles of Urban Structure, (2005)
Sansot, Pierre, Du bon usage de la lenteur, (2000)
Platt. R. H., The Ecological City, (1994)

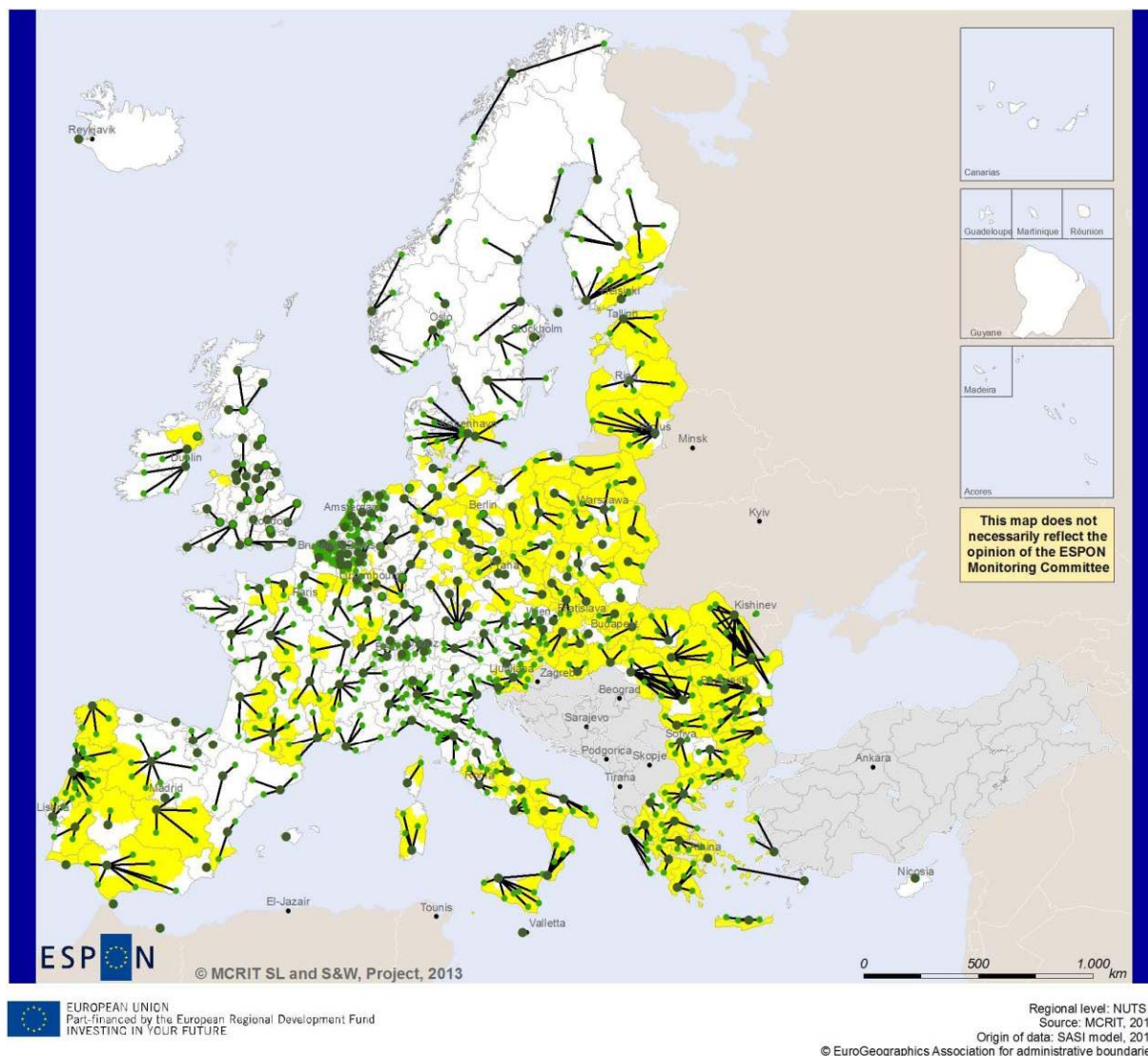


Illustration of Scenario C

Based on results obtained by SASI forecast model (2050)

- Capital NUTS 2
- Capital NUTS 1 (only Germany and United Kingdom)
- Capital NUTS 3 (except Germany and United Kingdom)
- NUTS1-NUTS2 links intra NUTS2 (only Germany and United Kingdom)
- NUTS2-NUTS3 intra NUTS2 links (except Germany and United Kingdom)
- Relative increases in GDP 2051 per capita Scenario C/Baseline average over 100 (100=EU31 ave)
- No data (No ESPON space)
- NUTS2 Boundaries

Figure 14 Illustration of Scenario C “Regions”

The specific spatial development pattern for each of the territorial scenarios is synthesised therefore as follows:.

	A Scenario (Promoting MEGAS)	B Scenario (Promoting CITIES)	C Scenario (Promoting REGIONS)	BASELINE
Spatial distribution of population and economic growth, (and territorial governance)	Relative accessibility and connectivity to international transport networks and agglomeration economies attract growth, following spontaneous market tendencies. Global cities, mostly MEGAS grow bigger.	Large cities attract both more people and activities because effective public policies promoting them at National scale. Internal migrations from sparsely populated areas to urban centres.	Medium-size cities and towns attract people based on their cultural and environmental quality, and strong public policies and incentives. Change in consumer behaviour favouring proximity and self-sufficiency. Intense decentralisation at local and regional level. Limited external migrations.	No relevant modification on actual spatial patterns

Figure 15 Spatial distribution of activities among ET2050 Scenarios

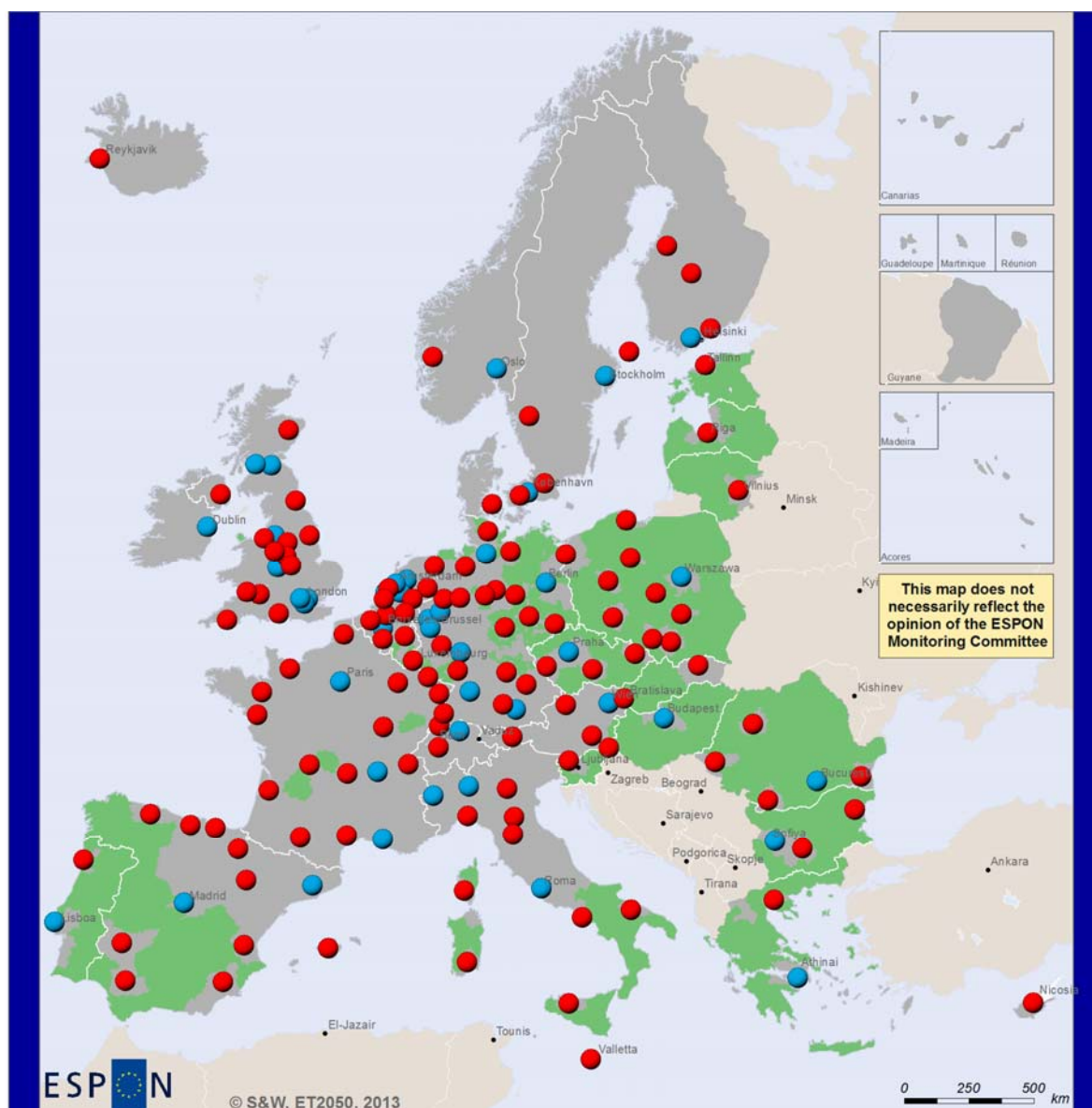


Figure 16 Areas promoted in the A (blue), B (red) and C (green) Scenarios

3.3 Scenarios facing the Critical Bifurcations

	Scenario A	Scenario B	Scenario C	Baseline
Will European national economies be able to adjust to structural transformations?	Reduction of Public Administrations. Further opening and deregulation of markets. Private-Public Partnerships. Public support to R&D	Policy reforms based on reinforcing social welfare. Public investments that allow for economic recovery	Policy reforms towards post growth societies limiting both large corporations and central public administrations.	No, partially
Will migrations continue to be necessary in Europe to shirking labour market?	Strong migrations bound to most performing economic corridors and MEGAs	Moderate migrations mostly bound to large urban centres from inner regions and other EU countries	Limited external migration. Residential mobility from large cities to medium and small towns	Migrations growing slowly mostly bound to largest metropolitan regions
Will European countries be able to sustain their welfare system?	Welfare system fully privatised	Reinforced to allow its maintenance and sustained through increased taxation	Reformed to facilitate Third Sector (ONG's, social communities...) interventions.	Welfare system reduced and further privatised.
Will Europe (and its single countries) be able to find ways to finance its public debt?	Financial debt fully repaid by 2030. Surplus	Financial debt reduced, but not fully repaid by 2030	Financial debt repaid in 2050	Financial debt remains high and public administrations are substantially reduced
Will Europe be able to compete with emerging countries in high-value sectors?	Increased overall competitiveness (manufacturing, biotech, medicine)	Competitive limited to sectors like transport, design, nutrition, green energies	Limited competitiveness to sectors like tourism and welfare services	European technological advantages reduced overtime
Will Europe be decarbonised and decentralized energetically, reducing GHG emissions?	Increased efficiency of fossil fuels, some RES, emergence of CCS. Targets partially met.	High development of centralised RES and nuclear. Targets partially met.	Decentralised RES. Lower energy consumption. Targets met.	Fossil fuels remain important. Emissions reduced but targets are not met.
Will Europe will be able to tap the untapped potential of its regional diversity richness?	Continuous de-territorialisation of the economy.	Yes at National level, while regions in each country will play a secondary role.	Local differences emphasised as a major European asset.	Partially.
Will spatial development and settlement structures be more polarised?	Development focussed on global cities (MEGAs), and on corridors linking them	Development mostly focussed on large and medium cities (FUAs)	Development focussed on medium and small cities with high quality of life	Increased polarisation
Will be Europe politically more integrated?	Europe of multiple speeds. Increased cross border integration motivated by economic interests. Increased relations with neighbouring space.	Continuation of existing trends..	Limited Federalism. No new EU Members.	No significant progress in EU political integration. Limited cross-border relationships. Croatia enters EU.
Will decision and management processes of EU key policies be more decentralised?	Corporate and business dominated top-down governance	Increased role of Nations (mixed top-down and bottom-up approaches)	Strengthened principle of subsidiarity. Bottom-up governance enforced.	Top-down governance with limited decentralisation

Figure 17 ET2050 Scenarios facing Critical Bifurcations

3.4 Policy Assumptions of Scenarios

Most relevant assumptions are presented in the next table:

Policies	BASILINE	A Scenario	B Scenario	C Scenario
Demographic policies	Continuation of actual trends	Lowered support to natality and families	Continuation of actual trends, as in Baseline	Public support to natality and families.
Migration policies	Continuation of actual trends	Openness to migrants from outside Europe	Relative openness	More strict immigration policies
Monetary policies	In Western European countries, stability of interest rates, ULC, exchange rates, inflation; Progressive convergence of Eastern EU towards Western European Countries values Decrease of interest on bonds: end of speculation periods			
Fiscal policies	Increase of tax rates in the Western and Eastern Countries. Debt/GDP remains constant	Slow tendency towards stability pact: 60% of Debt/GDP. Decrease of public expenditure growth rate especially in vicious countries.	Debt/GDP remains constant	Slow divergence from stability pact. Slight increase of public expenditure growth rate
Transport Policies	0,8% of European GDP invested in transport infrastructure by 2030 ²⁰ , mostly in long distance infrastructure (€1.970Bn 2013-2030). Slightly reduced modal allocation of investments to rail, and slightly increased to airports and ports. Single European Transport area fully developed for intra-Europe transport	0,6% of European GDP invested in transport infrastructure by 2030, mostly in long-distance infrastructure (€1.610Bn 2013-2030) Modal allocation increasing in air and maritime, and decreasing in rail European transport area opened to global competition. ITS deployment in road mode reduces costs by 5%. Reduced subsidies to rail.	1,0% of European GDP invested in transport infrastructure by 2030, mostly in medium distance infrastructure (€2.290Bn 2013-2030) Modal allocation increasingly rail based Single European Transport area fully developed for intra-Europe transport Pricing and taxation as in baseline	0,7% of European GDP invested in transport infrastructure by 2030, mostly in short distance infrastructure (€1.790Bn 2013-2030). Modal allocation focussed on collective modes and urban public transport Slow liberalisation and integration of the European transport market Road and air taxation causes 5% cost increases Rail and public transport subsidies
Energy policies	Fossil fuels remain important. Emissions reduced but targets are not met.	Increased efficiency of fossil fuels, some RES, emergence of CCS. Targets partially met.	High development of centralised RES and nuclear. Targets partially met.	Decentralised RES. Lower energy consumption. Targets met.
Environmental policies	Continuation of existing environmental management trends Euro-standards ²¹ regulation drops vehicle emissions to 100gr/km by 2030, (140gr/km in 2009)	Environmental protection focussed on keeping standards of environmental quality for air and water. Technologic optimism. Euro-standards drop vehicle emissions a 10% respect to baseline	Protection and management of rural areas as open spaces for leisure and environmental safety. Strong mitigation. Strict public regulations. Euro-standards drop vehicle emissions by 5% respect to baseline	Limits in both use intensity and quality standards and land occupation. Mixed Focus on adaptation. Euro-standards drop vehicle emissions by 20% respect to baseline

²⁰ General assumption for all scenarios on European transport investment: 0,9% in 1995; 1,2% in 2007; 0,6% in 2015

²¹ Regulation on transport vehicles environmental performance

Policies	BASELINE	A Scenario	B Scenario	C Scenario
Cohesion policies	Budget kept constant. Allocation among regions in 2007-2013 as 2000-2007 Limited and gradual reforms favouring efficiency with no major political change.	Half of the present budget. Allocation among regions in 2007-2013 as 2000-2007 Territorial cross-border cooperation reinforced as well as with Neighbouring countries and the rest of the World. Productive investments in neighbouring countries.	Budget kept constant. Allocation among regions in 2007-2013 as 2000-2007 Thematic objectives redefined favouring urban-oriented policies and innovative urban actions. Strict-land use instruments in vulnerable areas	Budget doubled. Regions type C get 2/3 of the budget, Type B 1/3 Integrated territorial investments and community-led local development reinforced. Place-based focus promoting endogenous development.
Agricultural policy	Limited reform of the CAP	Budget reduced and focussed on subsidies to increase the sector productivity	Limited reform of the CAP. Higher emphasis on landscape management	Full integration of agricultural and environmental policies in their territorial dimension through cohesion policy, particularly pillar II.

Figure 18 Synthesis of Scenario Assumptions on Exogenous Conditions and Policies

3.5 Comparison with reference European Scenarios: spatial dimension

Next table presents a comparison of the scenarios proposed in ET2050 together with other scenarios designed in relevant spatial-oriented scenario-building studies (see Annex 1 for a more extensive description of these scenarios):

Scenario Study	Scenario Orientations			
ET2050 - Project Specifications	A Europe of Flows Promotion of MEGAS	B Europe of Cities Promotion of Cities	C Europe of Regions Promotion of Regions	VISION
ET2050 - Interim Report 1	Global Flows	Creative Cities	Balanced Regions & Self-sufficient towns	VISION
ESPON 3.2	Pro-Competitiveness		Pro-Cohesion	
Netherlands 2040	Talent Towns	Metropolitan markets & Cosmopolitan Centers	Egalitarian Ecologies	
France 2020	Archipelago exploded	Centralism renovated	Local differentiated	Networked polycentrism
Territoires 2040	Postpolisation	Hyperpolisation	Depolisation	Regiopolisation
PLUREL 2025	Fragmentation and High-tech		Self-reliance and Sustainability	

Figure 19 Comparison between ET2050 Exploratory Scenarios and existing references

3.6 Comparison with reference European scenarios: socioeconomic dimension

A review of almost 100 prospective studies defining scenarios for 2030 and 2050 (approximately 300 different scenarios) at European and World level has been carried out to support a next step on the discussion process related to Exploratory Scenarios.

Next table shows a synthesis of most relevant scenarios studied, according to the geographic scale of reference and the consideration of main drivers.

The following two graphics display the same scenarios according to key policy-aims.

The analysis is based on an expert qualitative judgment when the scenario does not provide a quantitative description.

REPORT / STUDY	SCENARIOS	TERRITORIAL IDENTIFICATION				MAIN DRIVERS		
		Global	European	National	Local	Technology	Governance	Behaviour
UK OFFICE SCIENCE & TECHNOLOGY 2055	Perpetual Motion							
	Urban Colonies							
	Tribal Trading							
	Good Intentions							
FORWARD STUDIES UNIT "Five different futures for Europe" 2010	Triumphant Markets							
	The Hundred Flowers							
	Shared Responsibilities							
	Creative Societies							
	Turbulent Neighbourhoods							
CPB, "4 FUTURES 4 EUROPE" 2040	Strong Europe							
	Transatlantic Market							
	Regional Communities							
	Global Economy							
EMCC, "Trends and drivers of Change in the EU transport and logistics sector: scenarios 2017"	Take the A-Train							
	I'm in love with my car							
	Riding the rainbow							
	Moonlight ride in a Diesel							
ESPON 3.2. Europe 2030	Pro-active Europe							
	Cohesion-oriented							
	Competitiveness-oriented							
UN GEO-3	The Markets First							
	Policy First							
	Security First							
	Sustainability First							
MEDACTION 2030	Knowledge is King							
	Big is beautiful							
	Convulsive Change							
GLOBAL SCENARIO GROUP	Market Forces							
	Policy Reform							
	Great Transitions							
	Fortress World							
MILLENNIUM PROJECT SCENARIOS 2025	S&T develops a Mind of its Own							
	The World Wakes Up							
	Please, turn off the Spigot							
	Backlash							
FOCI - Future Orientation for Cities 2030	Green economy							
	Enhancing the European potential							
ReRisk 2030	Green High-Tech							
	Energy-efficient Europe							
	Nuclear Energy for Big Regions							
	Business as usual?							
SS-LR 2030	The Reference scenario							
	The Pro-active scenario ("Green Economy")							
	The Defensive scenario							
ESPON EDORA 2030	BAU							
	Gradual response to climate change + high levels of State							
	Rapid response to climate change + low levels of State							
	Rapid response to climate change + high levels of State							

REPORT / STUDY	SCENARIOS	TERRITORIAL IDENTIFICATION				MAIN DRIVERS		
		Global	European	National	Local	Technology	Governance	Behaviour
MILLENNIUM PROJECT SCENARIOS 2050 (Global Exporatory Scenarios)	Cybertopia							
	The Rich Get Richer							
	A Passive mean World							
	Trading places							
Netherlands Environmental	Trend Scenario by NEAA							
	Challenge Scenario by NEAA							
Megacities on the Move 2040	Planned-opolis							
	Sprawl-ville							
	Renew-abad							
	Communi-city							
PASHMINA: The World in 2050	Pear World							
	Apple World							
	Orange World							
	Potato World							
Global Europe 2050	Nobody cares: standstill in European integration							
	EU under threats: a fragmented Europe							
	EU renaissance: further European integration							
Netherlands 2040	Talent Towns							
	Cosmopolitan Centres							
	Egalitarian Ecologies							
	Metropolitan Markets							
France 2040	Hyperpolisation							
	Regiopolisation							
	Postpolisation							
	Dépolisation							
Aménager la France 2020	L'Archipel éclaté (un scénario néolibéral)							
	Le local différencié (un scénario néo-communautaire)							
	Le centralisme rénové (un scénario néo-jacobin)							
	Le polycentrisme maillé (un scénario de l'équité)							
One Planet Economy 2050	Clever and Caring							
	Fast Forward							
	Breaking Point							
	Slow Motion							
Digital Europe 2030	Open Governance							
	Leviathan Governance							
	Privatised Governance							
	Self-Governance Governance							
Innovating Futures 2025	Europe's Innovative Societies							
	European Innovation Fatigue							
	Cities Go Ahead							
	Innovations for Innovation's Sake							
Shell Energy Scenarios 2050	Blueprints							
	Scramble							
TRANSVISIONS European Transport 2050	Moving alone							
	Moving together							
	Stop moving							
	Moving less							
Logistics 2050	Mega-efficiency in Megacities							
	Customized lifestyles							
	Paralysing protectionism							
	Global resilience – local adaptation							
PRELUDE of Europe's future	Great Escape							
	Evolved Society							
	Clustered Networks							
	Lettuce surprise U							
PLUREL "Urban development Scenarios 2025"	Europe of Cohesion							
	Sustainability							
	Hyper-Tech							
	Fragmentation							
	Extreme water							

Figure 20 Classification of scenarios according to geographic scale of reference and the consideration of main drivers

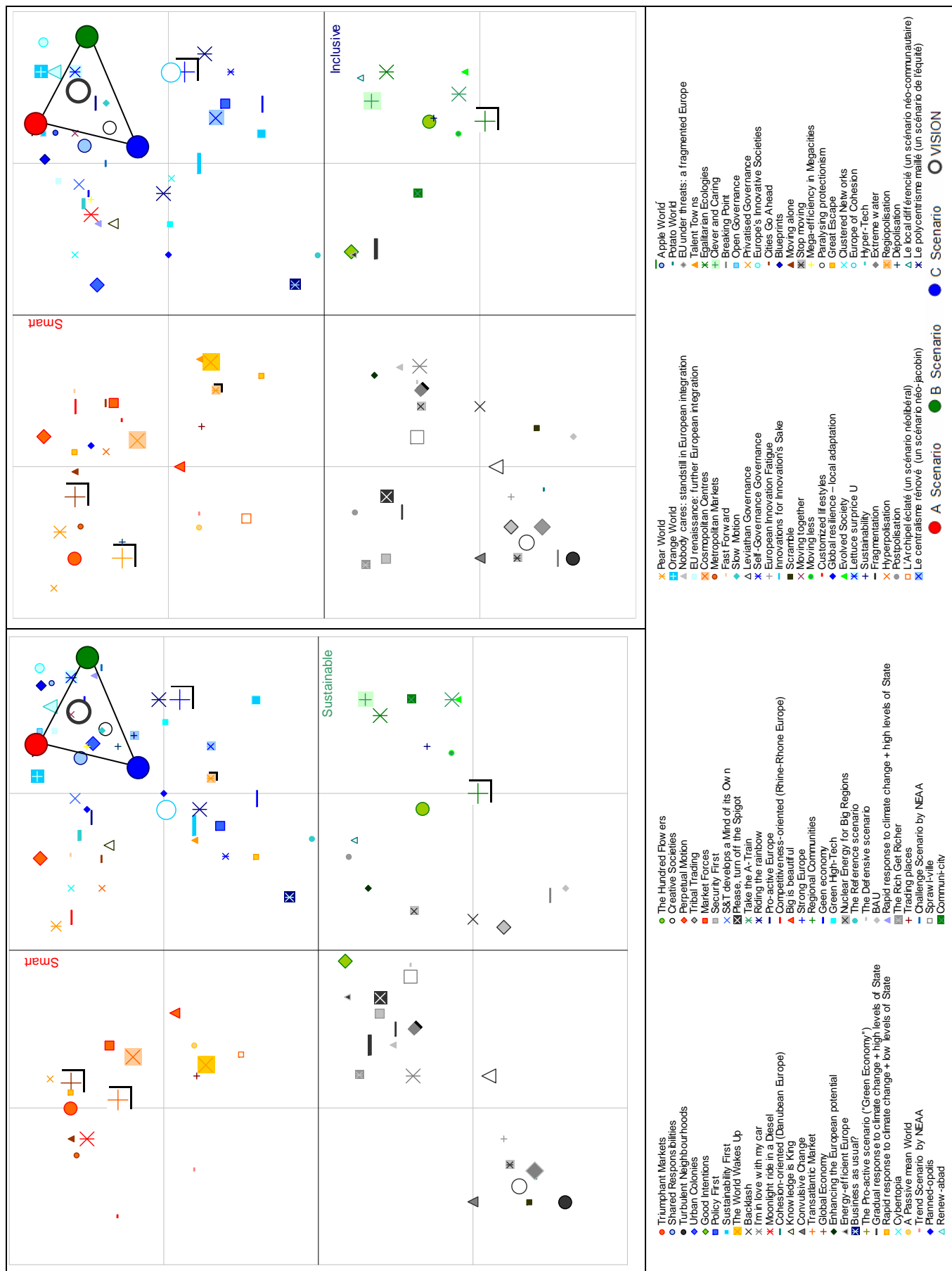


Figure 21 Classification of scenarios (graphic)

4. Annex 1 – Review of key European Scenarios

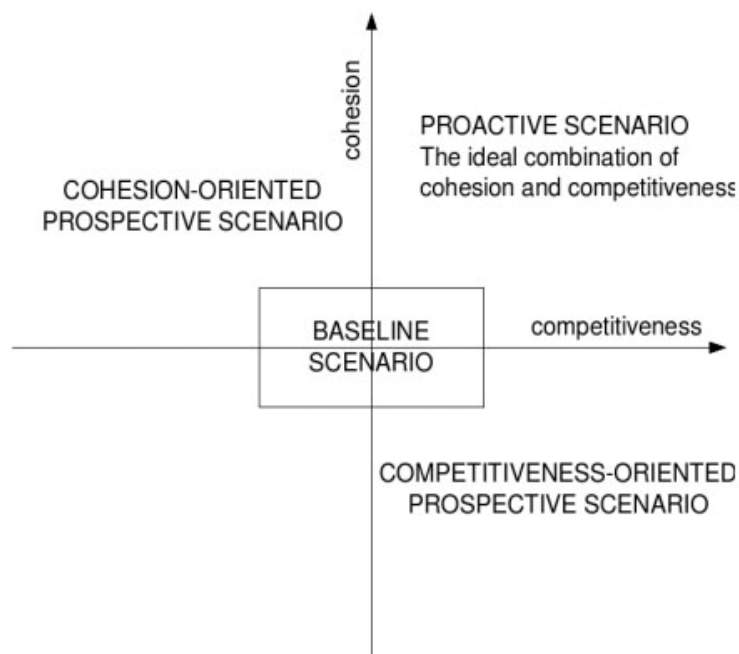
Spatial scenarios in relation to the ESDP and EU Cohesion Policy by ESPON (2007)²²

The main objective of the ESPON 3.2 project was to develop spatial scenarios. The time horizon for the spatial scenarios was set to 2015 (mid term) and 2030 (long term).

An integrated baseline scenario showed the probable evolution of the European territory in a situation of no major changes (political or external). Two prospective policy scenarios explored the effects of EU policy in a cohesion-oriented scenario (policies formulated with the goal of social, economic and territorial cohesion as top priority) and in a competitiveness-oriented scenario (overall global competitiveness of EU economy being the major objective).

The project discussed issues in the social, economic, territorial and environmental dimensions, including considerations on transport and mobility. Find below the most relevant characteristics of ESPON 3.2 scenarios in the mobility domain.

Next figure characterises considered scenarios:



ESPON 3.2 Scenarios in a cohesion // competitiveness 2D space

Source: Spatial scenarios in relation to the ESDP and EU Cohesion Policy by ESPON, 2007

²² ESPON 3.2 was carried out by a consortium constituted by IGEAT, AETS, BBR, CRS-HAS, CUDEM, DIG, MCRIT, NISR, Nordregio, UMS 2414 Riate

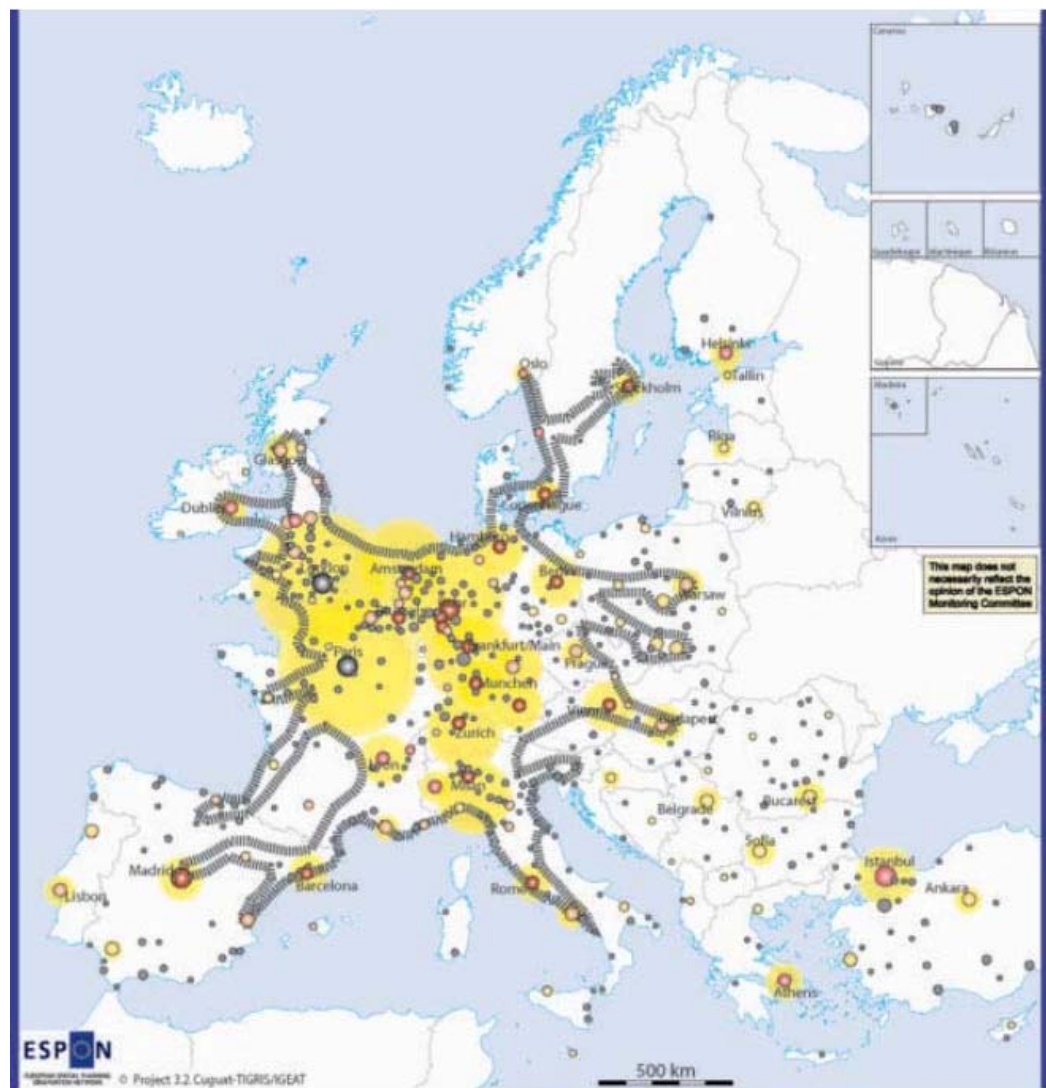
Baseline (trend) scenario

The territorial trend scenario for 2030 refers mainly to the impact of policy continuity in a context where new challenges emerge, adding to those already existing. Areas with good pan-European accessibility will spread from the central Pentagon area in almost all directions. However, disparities in accessibility between central and more peripheral areas will remain significant, especially regarding freight transport, and even more in terms of regional or local accessibility.

Sector	Main Characteristics
Demography	Reduced population ageing as a result of lower fertility and mortality rates Stable total European population (+ enlargement) Increasing, but globally controlled external migration Unchanged constraints on internal migration
Economy	Slowly increasing total activity rate Slowly growing R&D expenditure, but constant technological gap vis-a-vis the USA Decreasing public expenditure
Energy	Steady increase of energy prices Stable or decreasing European consumption Increasing use of renewables
Transport	Continued growth of traffic, but moderately curbed by energy price with possible modal shift Constant increase of infrastructure endowment, but below demand needs Partial application of the Kyoto Agreement
Rural development	Further liberalisation of international trade Increasing industrialisation of agricultural production, including the production of bio-fuels Further diversification of functions of rural areas; stronger dependence upon the residential economy and new forms of tourism Progressive reduction of CAP budget
Socio-cultural sector	Heterogeneous and insufficient policies related to integration Growing ethnic, religious and social tensions
Governance	Increasing co-operation between cross-border regions Increase in multi-level and cross-sectoral approaches, but limited to specific programmes (rural development); Maintenance of competition and incoherence between - policies devoted to innovation and competitiveness and Others devoted to cohesion
Climate Change	Moderate overall climate change (+1°) Increase in extreme local events Moderate emission levels due to new technologies Few (too few) structural adaptation measures
Enlargement	Bulgaria & Romania by 2007 Western Balkans (with Croatia acceding first) By 2020 Turkey By 2030 Continued combination of deepening and widening Modest impact of neighbourhood policy

ESPON 3.2 - Hypotheses of the Baseline scenario

Source: Spatial scenarios in relation to the ESDP and EU Cohesion Policy by ESPON, 2007



Trend Scenario:
Spatial structure and urban hierarchy in 2030

ESPON 3.2 - Spatial structure of Baseline in 2030

Source: Source: Spatial scenarios in relation to the ESDP and EU Cohesion Policy by ESPON, 2007

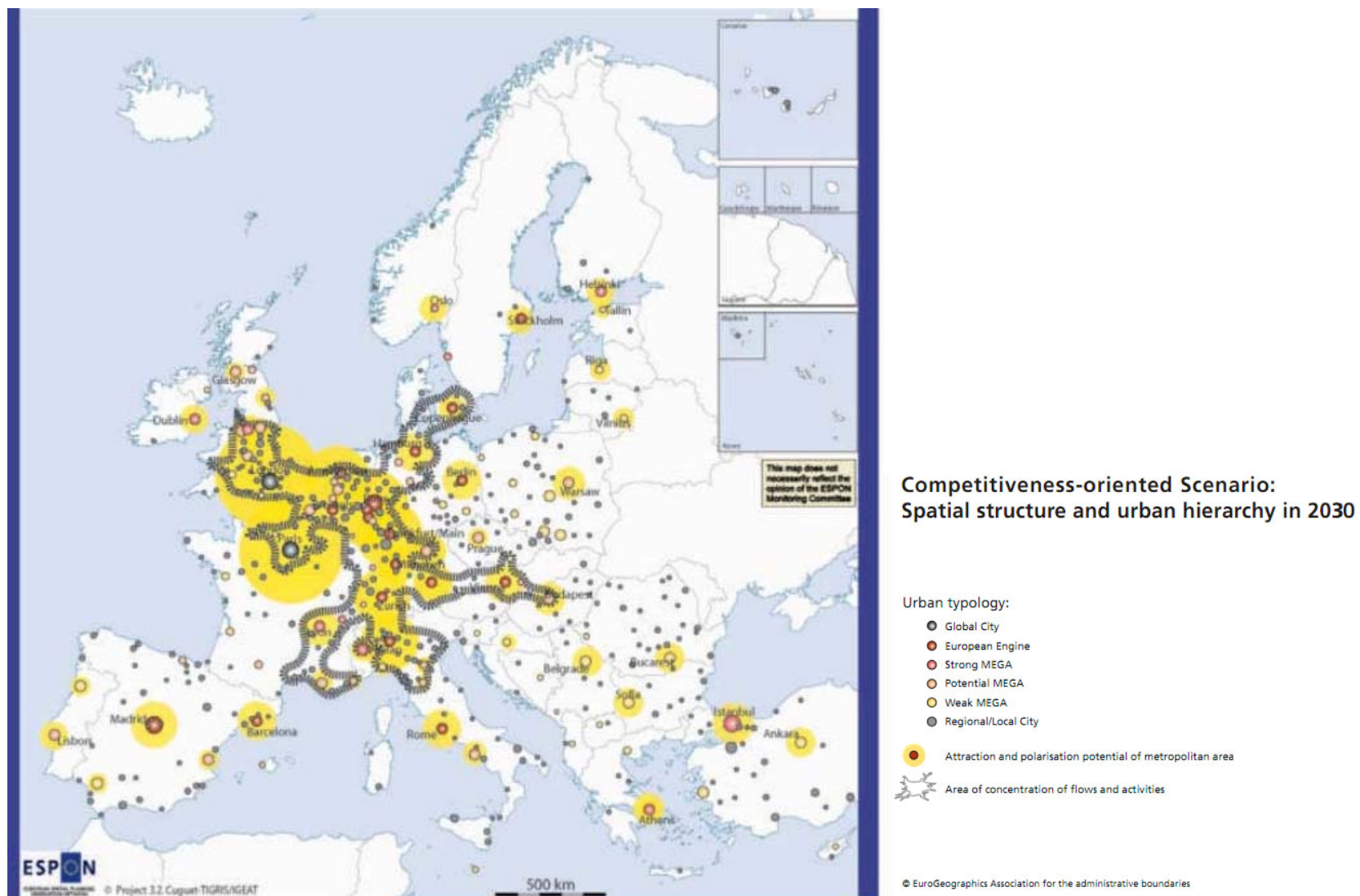
Competitiveness-Oriented scenario (Rhine-Rhone)

This scenario is a prospective, policy-oriented scenario. It is based on the assumption of a significant reshaping of EU policies originating in the disappointing results of the implementation of the Lisbon Strategy during the period 2000-2005. The EU budget is being reduced and EU expenditures are being targeted towards R&D, education, ICT and strategic external accessibility, including in structural policies. The CAP is subject to rapid and radical liberalisation, with a significant reduction of support, of external tariffs and of export subsidies. The budget of structural policies is also being reduced, with a part of former EU interventions being re-nationalised and EU support being concentrated on the most competitive areas of less developed regions. As a counterpart, public services are further liberalised and privatised, labour markets are regulated in a more flexible way and the third pillar of EU policies (foreign policy, justice, security etc.) is being strengthened.

Sector	Main Characteristics
Demography	Increase in selective external in-migration: economic sectors & destination Abolition of constraints to internal migration Increase in retirement age. Encouragement of fertility rate through fiscal incentives
Economy	Stronger reduction of total public expenditure compared with the baseline scenario Further privatisation and liberalization of public services Prioritisation of public expenditures in R&D, education, ICT and strategic external accessibility (ICT and transport) More and easily accessible venture capital 'Flexibilisation' of labour markets
Energy	Steady increase of energy prices European consumption increasing Realisation of TEN – E: investment in infrastructure according to market demand Priority to large-scale energy production for metropolitan areas as an alternative for oil and gas
Transport	Realisation of TEN-T: investment in infrastructure according to market demand Prioritisation of links between metropolitan areas Application of the Kyoto Agreement
Rural development	Rapid and radical liberalisation of CAP (reduction of tariffs, of budget and of export subsidies) Reduction of support to rural development policy Rapid industrialisation of agricultural production Strong dualisation of rural areas, resulting from market forces
Socio-cultural sector	Reactive management of social problems in large cities Increase of surveillance and security systems
Governance	Abolishment of barriers to cross-border co-operation Less public intervention Wider application of the Open Method of Coordination Increased role of private sector in decision making Strengthening of the third pillar of the EU policies: foreign policy, justice, security
Climate change	Moderate overall climate change (+1°) Increase of extreme local events Constant to increasing emission levels Mitigation measures based on flexible schemes & stimulation of alternative technologies. Adaptation measures only where cost efficient
Enlargement	Continuing enlargement to widen the market: Romania, Bulgaria in 2007 Western Balkan, EFTA/EEA countries in 2015 Turkey in 2020, Strengthening of the neighbourhood policy (Maghreb, Ukraine, Russia etc.)

ESPON 3.2 - Hypotheses of the Competitiveness-Oriented scenario

Source: Spatial scenarios in relation to the ESDP and EU Cohesion Policy by ESPON, 2007



ESPON 3.2 - Spatial structure of Competitiveness-Oriented in 2030

Source: Source: Spatial scenarios in relation to the ESDP and EU Cohesion Policy by ESPON, 2007

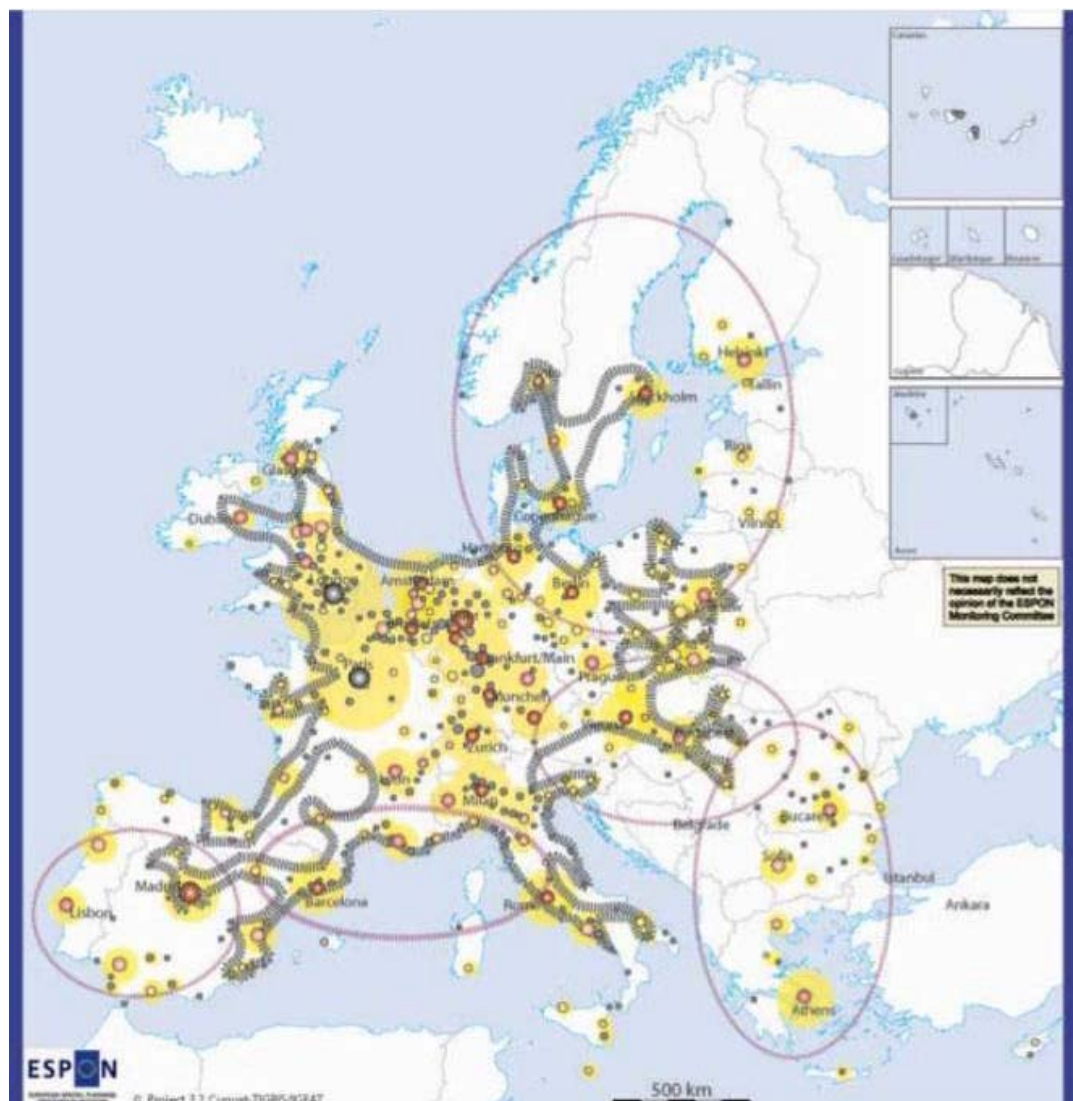
Cohesion-Oriented scenario (Danube)

In this scenario, the main priorities of public policies at EU level, in a context of growing globalisation, are focused on economic, social and territorial cohesion and not on global competitiveness.

Sector	Main Characteristics
Demography	Restrictive external migration policies More flexible retirement ages Better balance of population structure through encouragement of higher fertility rates More flexible arrangements for child care Unchanged constraints on internal migration
Economy	Maintaining the volume of the EU budget Reinforcement of structural funds and concentration on weakest regions Further harmonization of taxation and social security systems, as far as non detrimental to the competitiveness of less developed countries
Energy	Steady increase of energy prices Realisation of TEN-E Promotion of decentralised energy production , particularly renewables
Transport	Development of TEN-T with priority given to peripheral regions at different scales Support to transport services in rural and less developed areas Application of the Kyoto Agreement
Rural development	Minor CAP reforms, but shift from pillar 1 to pillar 2. Priority given to less developed rural regions in the field of direct payments to farmers (pillar 1) Priority given to environmental and animal health criteria Promotion of quality products Active policy for economic diversification in rural areas, including SMEs, tourism, residential functions etc.
Socio-cultural sector	Promotion of regional and European identities Integration of marginal groups like romany in peripheral areas Proactive socio-cultural integration policies, particularly in cities Increased fiscal and/or social investment in quality of life issues, like health, personal care, local environment, etc...)
Governance	Active multi-level territorial governance, particularly in areas supported by structural funds Strong role of public actors in territorial governance Stronger role for the European Commission
Climate change	Moderate overall climate change (+1°) Increase of extreme local events Constant emission levels strict mitigation measures (taxes, road pricing as far as non detrimental to peripheral regions) Wide range of adaptation measures like EU hazard funds and large investments
Enlargement	Deepening preferred to widening Brake on further enlargements (except Bulgaria and Romania) Only lip service to neighbourhood policy

ESPON 3.2 - Hypotheses of the Cohesion-Oriented scenario

Source: Spatial scenarios in relation to the ESDP and EU Cohesion Policy by ESPON, 2007



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

Urban typology:

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

● Attraction and polarisation potential of metropolitan area

Area of concentration of flows and activities

○ Emerging peripheral integrated zone

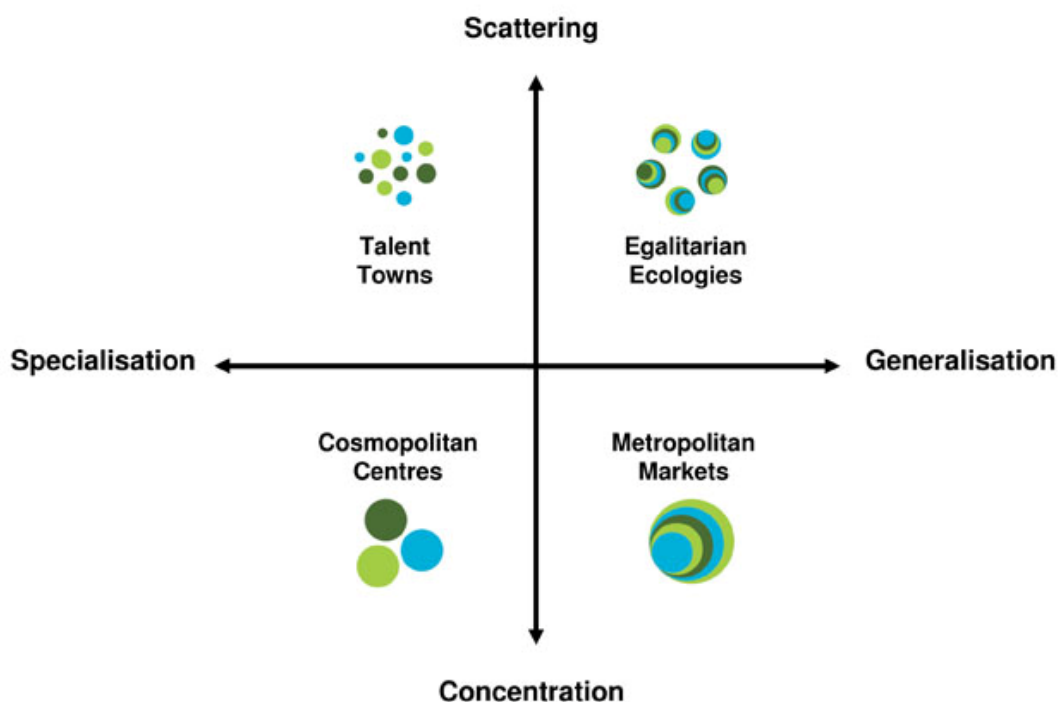
© EuroGeographics Association for the administrative boundaries

ESPON 3.2 - Spatial structure of Cohesion-Oriented in 2030

Source: Source: Spatial scenarios in relation to the ESDP and EU Cohesion Policy by ESPON, 2007

The Netherlands of 2040 by Netherlands Bureau for Economic Policy Analysis (2010)

This study develops four scenarios that can be used to think about the future of the Dutch economy in 2040.. The scenarios in this study are four consistent stories for such contingencies. They deal with two basic uncertainties: (i) the future division of tasks among workers—will it occur anywhere in the world or will production occur more locally and (ii) whether the size of cities will become larger or smaller. Together, these two uncertainties lead to the four scenarios presented in the figure below. The horizontal axis presents the options for the division of tasks; the vertical axis shows the possibilities for city size. The scenarios are labelled such that the first term reflects the characterisation of people and the second informs about the type of location.



NL2040 - Framework scenarios

Source: CPB (2010), *The Netherlands of 2040*, Netherlands Bureau for Economic Policy Analysis

Talent Towns (TT)

Imagine a world with relatively small cities (100,000 - 200,000 inhabitants) and specialised workers and firms. TT is a very dynamic world with excellent opportunities, but also major challenges. Communication technology (CT) enables specialist workers to co-operate in virtual teams. Consequently, firms employ specialists from all over the world. Specialist workers gain from personal interaction with their fellow specialists. Together with an attractive living environment, this determines their choice to live in small specialised towns. The strongly competitive environment enables high-skilled specialists to earn high incomes. However, the rising top performer of tomorrow can overtake the top performer of today. The wages of low-skilled workers suffer downward pressure due to global competition. The TT world faces the paradox of high demand for protection and redistribution, but limited supply. The comparative advantage of the Netherlands and other European countries lies within business services. Manufacturing activities move for the most part to Asia.

Cosmopolitan Centres (CC)

Envision a world of large cities (each of 2 to 8 million inhabitants) with global connections hosting specialised workers and firms. In a CC city, many specialists from all over the world combine their efforts in innovation, design and production. This global division of tasks relies on efficient and relatively cheap communication technologies, which facilitate intensive coordination between all steps in the production process. Cities develop into clusters of specialised activities. The largely science-driven expansion of bio- and nanotechnology demands close cooperation between researchers in universities and firms. The prosperity of these cities might be threatened if other cities contest or take over their comparative advantage. Therefore, income levels may differ substantially between centres and between a particular centre and its hinterland. Substantial income inequality also exists within cities, because the large CCs attract a broad range of supporting tasks. The Netherlands may host a few of these clusters in which it has a comparative advantage. Dutch CC cities may specialise in, for instance, company headquarters, water management and engineering, biomass technology, medical engineering, creative activities or logistics services.

Egalitarian Ecologies (EE)

Variety and dispersion characterise egalitarian ecologies. Economic activity spreads out over medium-sized cities (100,000 - 500,000 inhabitants) that host medium-sized firms. Successful cities are hotbeds of high-quality production, and offer opportunities for creative cooperation on a small scale. Knowledge resides largely in the minds of the country's generalist employees in combination with the databases and other IT-applications of firms. The IT systems enable firms to produce differentiated products that cater to differences in local demand. Living and working activities spread out over space. Because firms benefit little from being located near each other, they turn away from large cities and settle in medium-sized cities. These cities offer high-quality private and public services and provide agreeable living conditions for their employees. EE represents a world with little income growth and modest income differentials. Because technological progress levels off and considerable wealth flows to suppliers of raw materials, disposable income grows only moderately. Medium-sized cities the Netherlands flourish, building on their strengths in fields such as creative industries, agricultural services, healthcare products, fashion and design. Economic activity in the Randstad keeps pace, because the Netherlands retains its position in the transport of final goods all over Europe.

Metropolitan Markets (MM)

Think of a few very large metropolises with more than 10 million inhabitants dominating the world. Large factories, huge office buildings and sky-high apartment blocks characterise these cities. Economic activity is concentrated in dense areas, where economies of scale and scope are optimally exploited. Metropolitan Markets is a world in which the winning cities take all. In MM, bio- and nanotechnology break through. Their sheer complexity requires extensive research facilities and a high degree of tacit knowledge exchange within large firms to create sufficient potential for developing marketable applications. Metropolises attract firms and people. In metropolises, firms find trusted business partners, knowledge centres, a large supply of generalist workers and many consumers. People move to a MM city to select the best job, to build interesting relationships and to benefit from an appealing supply of cultural and recreational services. Where the metropolis thrives, the hinterland lags behind. The metropolis attracts all of the highly productive firms and higher-qualified people. Income inequality is large-both within the metropolis and between the metropolis and the hinterland. The Netherlands faces the challenge whether it is large enough to host a local metropolis. Given the scale and scope of MM cities there is a chance that this is impossible. In that case, the Netherlands as a whole becomes a hinterland. Neighbouring European metropolises would attract all company headquarters, research centres and talented people.







Table 8.1 Main Scenario characteristics				
	Talent Towns	Cosmopolitan Centres	Egalitarian Ecologies	Metropolitan Markets
				
City size, in population	100k – 200k	2 – 8 m	100k – 500k	> 10 m
Technology, knowledge				
Direction ICT	Communication	Communication	Information	Information
New GPT	None	Research-oriented	None	Application-oriented
Knowledge	Specific	Specific	General	General
Knowledge spillovers	Similar workers	Similar workers	Different workers	Different workers
Innovation	Direct applications, strong competition	Radical, firm – university links	Applied and incremental	Fundamental and applied, within firms
World economy				
Brasil	Attracts some manufacturing	Fails to create CC	Limited trade options	Regional growth engine
Russia	Benefits from its resources	Energy-intensive industries	Benefits from its resources	Some growth from natural resources
India	Stalls	Services centres	Inward-oriented	Several metropolises
China	Manufacturing	Manufacturing hub	Social tensions	Many metropolises
South-east Asia	Manufacturing intermediaries	Manufacturing	Growth-constrained	Some metropolises
United States	Top-end innovation and design	GPT, services	IT products and local varieties	Many metropolises
European Union	Business services	High-end services	Local varieties	Metropolis less common
Trade	Global market, high trust, strong trade agreements	High and broad, trade in intermediaries	Final products; limited idea flows, resource tensions, non-tariff barriers	Limited, autarkic metropolis, battle for resources
Place of business				
Agglomeration	Scattered	Concentrated	Weak, medium city size, local varieties	Highly concentrated
Infrastructure	Virtual + air connections	Extensive, high quality	Regional	Locally high quality
Organisation of firms	Virtual teams	Specialised plants	Medium-sized plants	Conglomerate
Decision power in firm	Centralised	Centralised	Decentralised	Decentralised
Supply chain	Broken, footloose	Outsourcing	Integrated	Highly integrated
Capital market	Continental, venture capital	Global, equity	National, credit	City, bonds

Table 8.1 (continued)		Main Scenario characteristics			
		Talent Towns	Cosmopolitan Centres	Egalitarian Ecologies	Metropolitan Markets
					
People					
High-skilled workers		Talent is highly rewarded, operate from home	Talent is highly rewarded, move to CC	Moderate wages, live in suburbs	Substantial wages, live in city centre
Medium- to low-skilled workers		Strong competition, pressure on wages	Personal services, regionally mobile	Substantial demand, immigration, stable wages	Reasonable wages, live in outskirts of MMs
Social capital		Bridging	Bridging	Bonding	Bonding + bridging
Challenges and risks					
Markets for goods and services		Protectionism, large flexibility	Barriers to trade and mobility	Trade tensions	Market power of conglomerates
Resources		Lack of excellent human capital	Inadequate education and research infrastructure	High prices of natural resources	Congestion and pollution
Vulnerability to shocks		High: specific human capital and city output	High: specific human capital and large city output	Limited	Low
Income inequality		High: due to specialisation	Very high: large cities and specialisation	Low	High: due to large metropolises
Social		Weak solidarity, weak protection	Weak social structures	Ethnic tensions	Crowded cities

NL2040 - Scenario's Characteristics

Source: CPB (2010), *The Netherlands of 2040*, Netherlands Bureau for Economic Policy Analysis

France 2020 by DATAR (2002)²³

DATAR offers in this book the result of forward thinking on France in 20 years. After an analysis of issues critical to the future, the tensions at work and they can induce reversals, four exploratory scenarios are presented. They are built around one key variable: the dominant mode of public action and territorial frameworks privileged. They set out the implications of the options on the spatial dynamics and the main features of the organization of the territory.

Archipelago exploded (a neoliberal scenario)

This scenario is characterized by a fragmented territory in which opposing dynamic cities, economically efficient and internationally competitive and marginalized areas. The action of the state is primarily to provide efficient framework for market development. The state should help, without real success, and difficulties in territories away from the predominant dynamic that, in this model are not supported by regional solidarity.

Local differentiated (a scenario New Community)

Local differential scenario shows an area where the creative initiatives of economic values and socio-cultural multiplied decentralized levels of giving shape to many heterogeneous entities forging links between them cooperation on thematic projects. Not having anticipated and set rules, the state is in a position to mediate disputes between territories. He tries to temper imbalances and to ensure access of all citizens to public services. He is forced to reinvent its role in the direction of greater flexibility, to reintroduce an overall coherence.

Centralism renovated (neo-Jacobin a scenario)

Centralism renovated features a state legitimized in its desire to retain a role on behalf pre-eminent issues of national solidarity, cohesion, and even environmental protection in the context of European integration measured. Spatial embodies this voluntarism; local initiatives are firmly framed without going back on the principles of decentralization. The aim of the government interventions is to integrate the areas lagging behind in a pattern that still has much to center-periphery model.

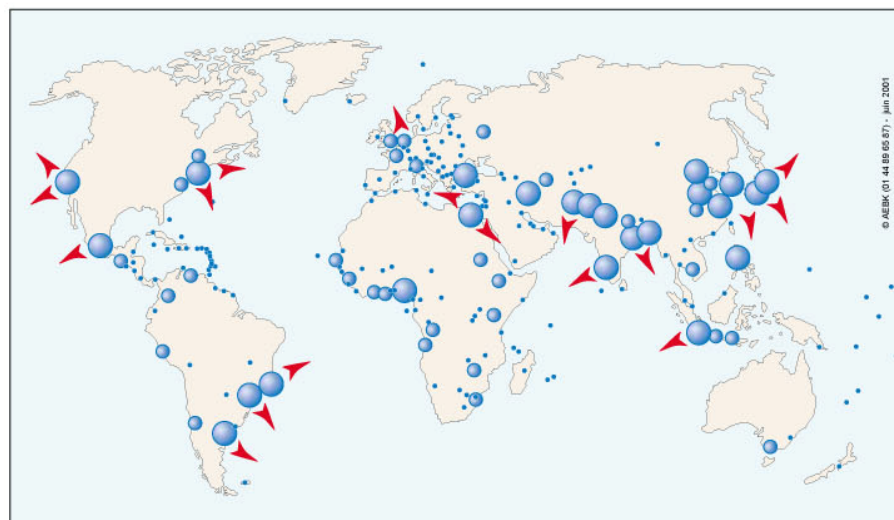
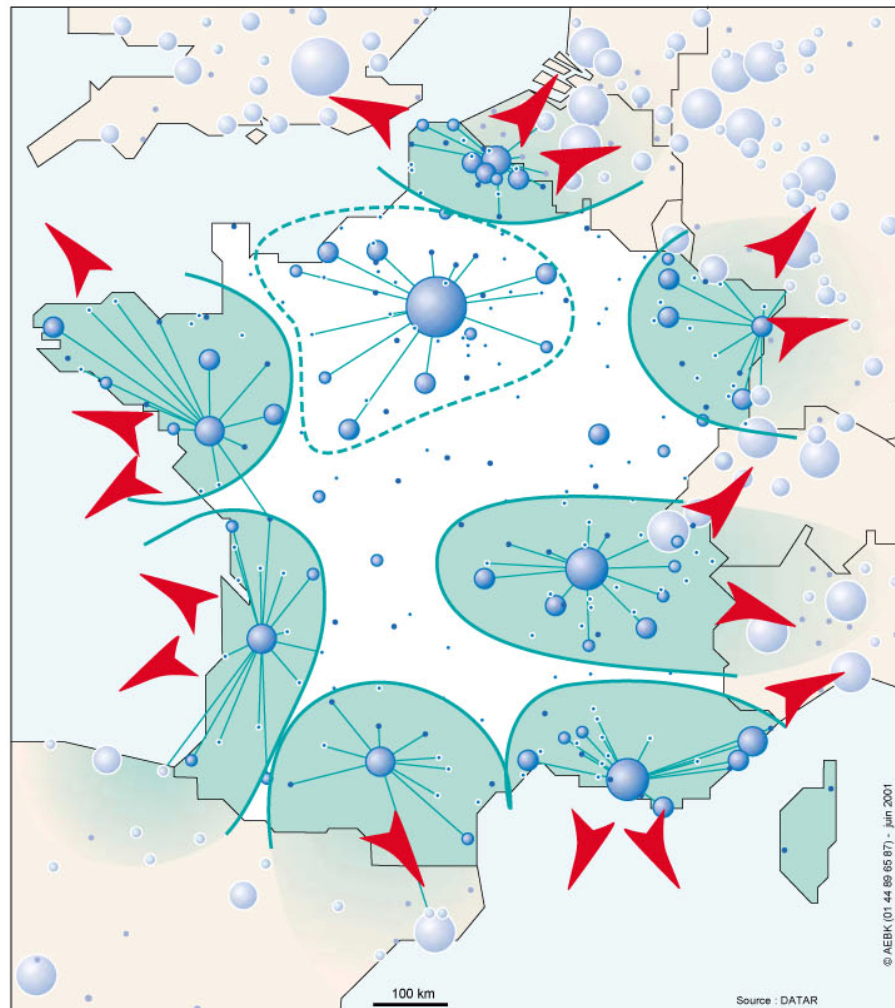
Networked Polycentrism (a scenario of equity)

This scenario puts on the restructuring of territories and redefining the mission of public power. The territorial dynamics based on the one hand, on participatory approaches in project areas: cities, countries, regional parks, and, secondly, on creative cooperation between cities and regions, around issues of interregional scope to the scale of large river settlement. The structuring of simultaneous network micro-territorial level and the macro-poles makes a territorial integration of the territory that reinforces in a Europe which was also the choice of polycentrism. The state envisages a policy of adaptation to the territories and lived spaces issues, but mainly engages in strategies measured on territorial differentiation supported a renewed concept of "regional balance".

²³ DATAR (2002) *Aménager la France de 2020*

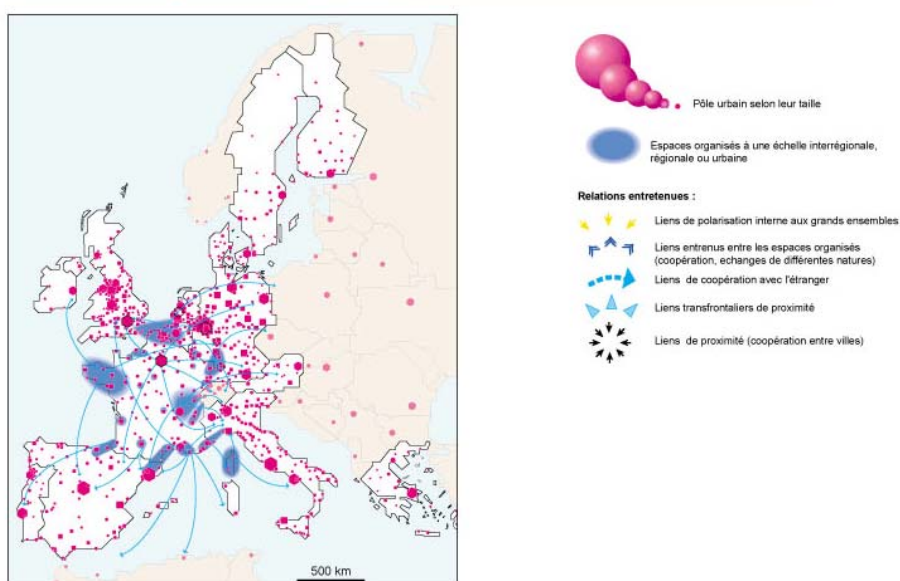
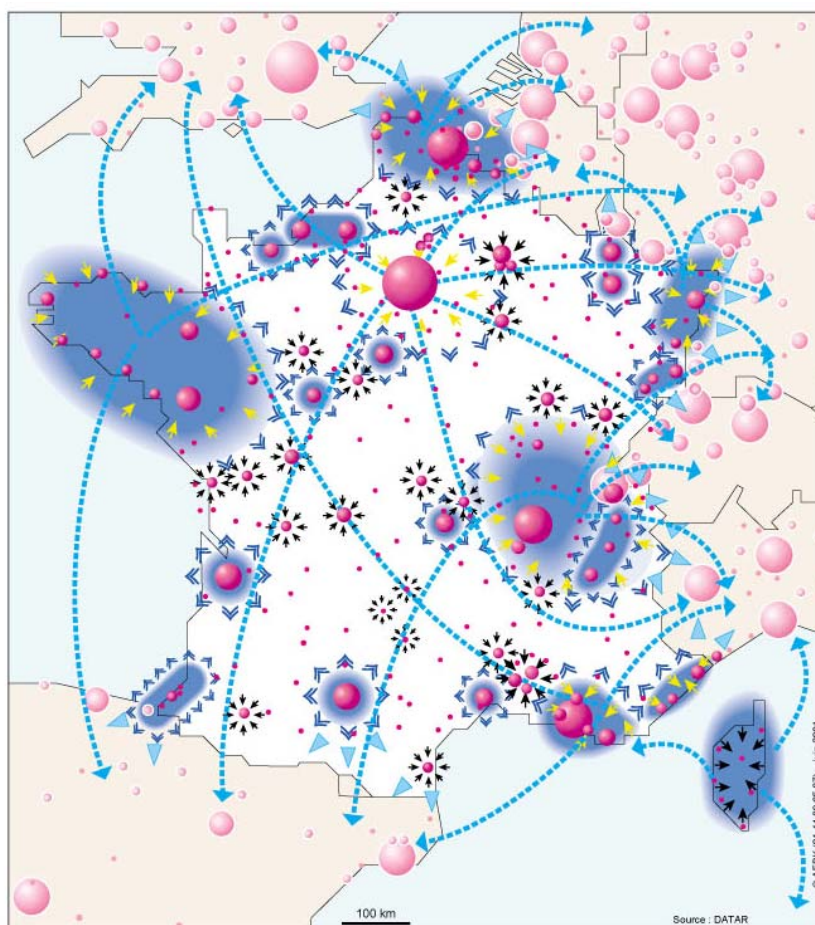
Scenario 1: Archipelago exploded

Globalisation stimulates certain urban nodes and prompts competition between localised networks. Spaces polarised by the most performing regional metropolis are not able to organise the whole of the territory



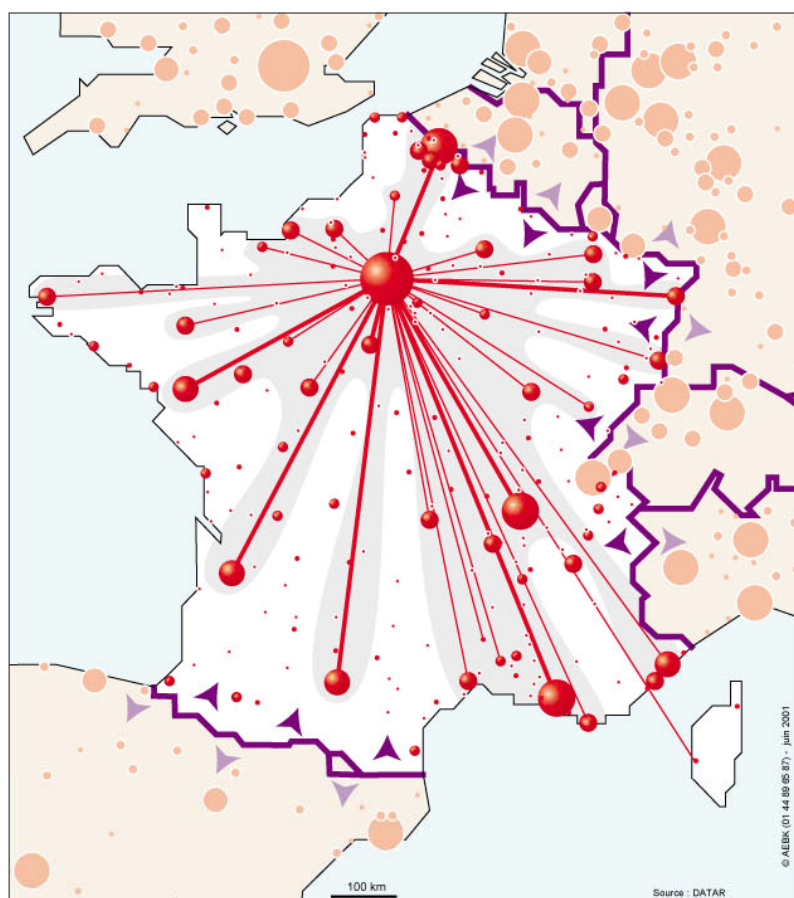
Scenario 2: Local differentiated

The organisation of the territory is largely a function of local initiatives which favour different forms and degrees of polarisation, based on national and European networks of interchange. In absence of national initiative, certain territories have trouble in getting structure, i.e. in developing.



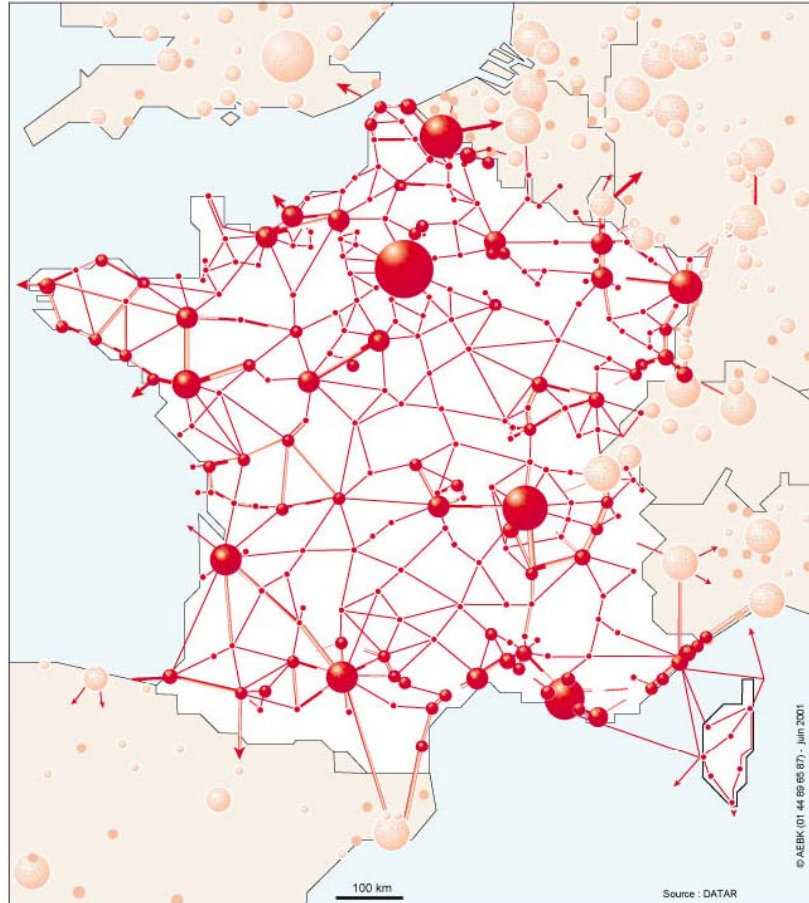
Scenario 3: Centralism renovated

Hierarchies are reinforced: the State promotes a centralised regulation of all territories by limiting the autonomy of local communities. On the other hand, public solidarity is devoted to benefit territories with difficulties



Scenario 4: Networked Polycentrism

Development is structured over an urban network where polycentricism is reinforced at two territorial scales: first at interregional level with frameworks of cooperation-competition between cities, and second at agglomeration / national level with new networks of local project management



FRANCE2020 – Four Scenarios

Source: DATAR (2002), *Aménager la France de 2020*

Territoires2040 by DATAR (2011)²⁴

DATAR officially launched on October 2009 a programme of prospective on a national scale entitled *Territories 2040, developing the change*. By promoting this cycle of reflection-oriented strategy and action, DATAR reshapes the way it has practiced foresight over the last 50 years. In the third number of the Territories2040 magazine, M.Lussault presented in the framework of the workshop “The network of French metropolises in the World-Economy”²⁵ the main variants in which French metropolises built different “connecting” territorial systems aimed at enhancing the links between France and the Globalisation.

Hyperpolisation

In 2040, the dynamics of global urbanization have led to the formation of a single network hyperpolarised in France, characterized by the metropolitan coopetition between its nodes. Coopetition can be defined as a mixture of competition and cooperation between the different poles. Each metropolitan node is to base its economic development on the concentration of creative functions (research, higher education, culture) and their application, being now central to national and international attractiveness and value added production. This concentration will be accompanied by a branding strategy through major events and the exploitation of the image of central metropolitan nodes. Across the territories, the hyperpolisation strengthens logical concentration in multifunctional centres, constituting overall systems centralities strongly polarised. Large networks will be strongly structuring urban territorial dynamics and allow the functional efficiency and accessibility to spaces. University campuses and creative spaces become metropolitan attractors, around which many will develop public policy.²⁶

Regiopolisation

In 2040, it will be found in France a strong very differentiation of the different territories in the framework of formation of mega-polarised regions, being called regiopoies. This powerful process will lead to a restructuring of the current national regional divisions. The scale nation-state will become a lower reference in terms of territorial control. A deep tax reform will give cities and regions real capacity to gather the necessary resources to develop their public policies. Planning policies attempt to contain the suburban sprawl phenomena and we witness actions of densification as well as targeted operations of requalification of iconic areas in some new agricultural and forestry areas. Mobility systems are organised in such a way to provide better access to various regional centres. The mobility paradigm based on private automobile will only remain relevant in most periurban spaces, while in the densest suburbs effective public mobility systems will be implemented.²⁷

²⁴ L'urbain-metropolisé français dans la mondialisation – processus et scénarios, Michel Lussault, for *Territoires 2040*, DATAR 2011

²⁵ “Le réseau des métropoles françaises dans l'économie-monde”

²⁶ In original French, “*Hyperpolisation. En 2040, la dynamique de l'urbanisation mondiale aura abouti à la constitution d'un seul réseau hyperpolisé en France, caractérisé par la coopétition entre ses nœuds métropolitains. On définit ici la coopétition comme un mélange de compétition et de coopération entre les différents pôles. Chaque nœud métropolitain fondera son développement économique sur la concentration des fonctions créatives (recherche, enseignement supérieur, culture) et leurs applications, devenues essentielles à l'attractivité nationale et internationale et à la production de valeurs ajoutées. Cette concentration s'accompagnera d'une stratégie de branding, via les grands événements et l'exploitation de la capitale image d'un nœud métropolitain. À l'échelle des territoires de vie, l'hyperpolisation renforcera les logiques de concentration dans des pôles multifonctionnels, constituant globalement des systèmes de centralités fortement polarisants. Les grands réseaux et les commutateurs urbains seront puissamment structurants des dynamiques territoriales et permettront l'efficacité fonctionnelle et l'accessibilité maximale aux espaces. Les campus universitaires et les espaces créatifs deviendront aussi et vraiment de nouveaux attracteurs métropolitains, autour desquels s'élaboreront bon nombre de politiques publiques.*”

²⁷ In original French, “*Régiopolisation. En 2040, on constatera en France une différenciation territoriale forte (donc un maintien voire une accentuation des polarités) dans le cadre de la constitution de méga-régions polarisées par l'urbanisation métropolisante, appelées regiopoies. Ce mouvement puissant conduira à une recomposition du découpage régional national actuel. L'échelle stato-nationale deviendra une référence plus faible en matière de contrôle territorial. Une réforme fiscale profonde donnera aux métropoles et aux régions de véritables capacités de collecte des ressources nécessaires aux politiques publiques. Les politiques d'aménagement tentent de contenir les phénomènes d'étalement périurbain et on assiste même à des actions de densification ciblées ainsi qu'à des opérations de requalification emblématique d'espaces pavillonnaires très peu denses en territoires néo-agricoles et forestiers. Le système mobilitaire est organisé pour assurer à la fois la meilleure accessibilité aux différents*”

Postpolisation

In 2040, urbanisation and globalisation have infused the entire national territory and signs of this will be felt everywhere mostly through widespread suburbanization. So this is the scenario with most evident signs of victory of low density peripheries over centralisation and generalisation of the principle of diffusion, conceived both as a principle of development and an urban form, valid at all scales in the same time. Postpolisation will be a largely self-organizing and self-promoted process by actors but with a real support by the public sector, mostly through the intervention of networked territorial governances (the scale of governance is chosen depending on the type of issue addressed) relying on the local scale, whose powers will be enhanced (the State falls back on the role of regulator). In particular, public operators make possible the enhancement of urbanisation, that is to say the process of suburban development permitted by financial transfers by state, local or private actors.²⁸

Dépolisation

In 2040, the urban evolution will tend to weaken significantly the effects of polarisation of the territories in favour of a hierarchical spatial organization distributing the little realities as a generalized principle of low density. Centralities will no longer be functionally important or referential of social practices. There has been a triumph of digitising companies and in particular the success of social networks that become reference of communicative modes. The diseconomies of scale of large technical systems and urban infrastructure are growing, as funding opportunities are increasing and individuals fleeing dense areas. The emergence of new technical solutions for self-sufficiency can take a stall and ensure domestic autonomy of individuals and / or neighbourhood groups. Faced with the loss of link business-territory that had been constitutive of metropolitan urbanization, there is the formation of micro-markets both local and networked²⁹

pôles régionaux. Le modèle de l'automobile individuelle ne reste notable que dans les espaces les plus périurbains, alors que même les périphéries plus denses se dotent de moyens mobiliers efficaces"

²⁸ In original French, "Postpolisation. En 2040, l'urbanisation et la mondialisation auront infusé l'intégralité du territoire national et les manifestations s'en feront sentir partout, sous la forme d'une périurbanisation généralisée. Il s'agit donc du scénario qui signe la victoire de la périphérisation la moins dense sur la centration et la généralisation du principe de la diffusion, conçue à la fois comme un principe d'évolution et une forme urbaine, valable à toutes les échelles en même temps. La postpolisation sera donc un processus largement auto-organisé et auto-promu par les acteurs mais avec un réel accompagnement par la puissance publique, notamment via l'intervention de gouvernances territoriales en réseau (l'échelle de gouvernance est choisie en fonction du type de question abordée), appuyée sur les territoires locaux aux compétences renforcées (l'État se replie sur une fonction de régulateur). En particulier, les opérateurs publics rendront possible l'accentuation de la résidentialisation, c'est-à-dire du processus de développement du pavillonnaire permis par les transferts financiers redistributifs de l'État, des collectivités, voire des acteurs privés"

²⁹ In original French, "En 2040, l'évolution urbaine tendra à affaiblir significativement les effets de la polarisation des territoires au profit d'une organisation spatiale très peu hiérarchisée distribuant les réalités selon un principe généralisé de faible densité. Les centralités ne seront plus fonctionnellement importantes, ni référentielles des pratiques sociales, des imaginaires territoriaux et des actions politiques. On assiste à un triomphe de la numérisation des sociétés et en particulier au succès des réseaux sociaux communicationnels qui deviennent référentiels des modes de définition des proximités acceptables et légitimes pour tout un chacun; La déséconomie d'échelle des grands systèmes techniques et des infrastructures urbaines s'accroît, à mesure que les possibilités de financement s'accroissent et que les individus fuient les secteurs denses. L'apparition de nouvelles solutions techniques d'autosuffisance permet d'assumer le décrochage et d'assurer l'autonomie domestique des individus ou/et des groupes de voisinage restreints. Face à la disparition du lien entreprises-territoires qui avait été constitutif de l'urbanisation métropolitaine, on assiste à la constitution de micromarchés à la fois locaux et en réseaux"

		SCÉNARIOS			
		Hyperpolisation	Régiopolisation	Postpolisation	Dépolisation
COMPOSANTES	Géographie	Un seul réseau hyperpolisé en France et des espaces en décrochage	Constitution de mégarégions à dimension européenne avec des interfaces transfrontalières ou/et des façades maritimes	Périurbanisation et périphérisation généralisée Persistance de quelques lieux de centralité fonctionnellement importants	Espaces de peuplement diffus et entités de voisinages multicentrées Déprises des centralités Subsistance de commutateurs mobiliers
	Dynamique et cohérence	Exacerbation de la concurrence économique mondiale Politiques de densification et de maîtrise des externalités environnementales Raréfaction de l'argent public et focalisation des financements	Concurrence économique mondiale forte Politiques européennes structurantes Affaiblissement du rôle de l'État Construction d'identités régionales territoriales	Infusion de l'intégralité du territoire par l'urbanisation et la mondialisation Individualisation des comportements Mobilité généralisée Promotion des circuits courts et des solutions environnementales individualisées Système de décroissance	Sortie du modèle urbain métropolitain Numérisation des sociétés et solutions de production énergétique autonome Nouvelles régulations infra-locales et focalisation sur la cellule domestique Décroissance assumée
	Acteurs clés	État Métropoles Opérateurs de réseaux Acteurs de l'économie de la connaissance	Europe / International Régions Gouvernements métropolitains Intercommunalités Collectifs de voisinage	État limité à une fonction de régulateur Régions et intercommunalités Gouvernances territoriales en réseau Individus et ménages	Individus Communautés + TIC
	Impact sur les territoires	Logiques de polarisation urbaine Concentration des fonctions créatives dans les métropoles Prégnance des grands réseaux techniques Fortes ségrégations sociospatiales Risque d'hyperpôle offshore par rapport à des territoires qui décrochent	Étalement périurbain contenu Intégration des espaces agricoles, forestiers, de nature dans les régiopoles Excellente accessibilité du territoire aux échelles régionales et infra Système mobiliaire durable	Fin de la hiérarchie urbaine Ségrégation socio-spatiale Fortes inégalités entre territoires bénéficiant de revenus résidentiels et ceux en déprise Gestion durable locale des territoires et préservation des ressources	Déterritorialisation des pratiques et prégnance des réseaux mondiaux et sociaux Nouvelles identités a-territoriales ou repli communautaire Diminution des mobilités
	Enjeux principaux	Nouvelle organisation institutionnelle Enjeu de la capacité financière Préservation des équilibres sociaux Effets d'entraînement sur les territoires	Invention d'une Europe des régions Question du périmètre pertinent pour permettre des effets d'entraînement Redéfinition des politiques agricoles et forestières Maintien d'une cohérence globale entre régiopoles	Soutenabilité économique, sociale et environnementale Efficacité des circuits courts Impacts de la dématérialisation Gouvernance multi-échelle associant les citoyens	Réorganisation spatiale en situation de dédensification Nouvelles formes politiques de proximité Justice spatiale et équité à une échelle globale

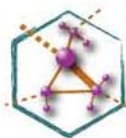
Territoires2040 – "L'urbain-metropolisé français dans la mondialisation", scénario description

Source: Michel Lussault (2011) for Territoires 2040

Figure 5. Scénarios et variantes : modélisations et descriptions

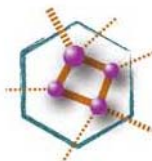
Hyperpolisation

Hiérarchisée



La métropolisation se poursuit sans remettre en cause la hiérarchie urbaine hexagonale. Le cadre national définit la hiérarchie des pôles urbains.

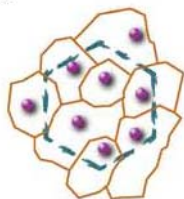
Archipellisée



La métropolisation se concentre sur un nombre restreint de grands pôles régionaux, tendant à réduire les écarts d'urbanité au sommet de la hiérarchie des villes.

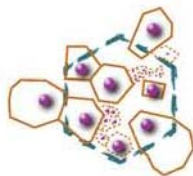
Régionalisation

Exhaustive



Des entités politiques macrorégionales et internationales se partagent de fait le territoire national autour de pôles métropolitains transnationaux. Les effets d'entraînement et les solidarités sont pris en charge en priorité par ce niveau d'organisation territoriale.

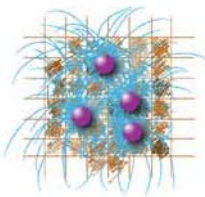
Lacunaire



Des macrorégions optimales et internationales animent des territoires à haute performance économique. Les espaces intersticiels trop loin des capitales régionales ou sans apport de valeur ajoutée ne sont pas intégrés au niveau macrorégional et relèvent de solidarités à d'autres niveaux spatiaux.

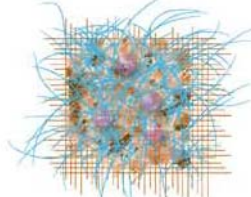
Postpolisation

Géostable



La métropolisation a gagné en profondeur le territoire national, sans pour autant remettre en cause les centralités préexistantes et leur hiérarchie. Il s'agit d'une forme d'urbanisation généralisée du territoire national, portée par les individus et la réticulation croissante de leurs mobilités et leurs télécommunications.

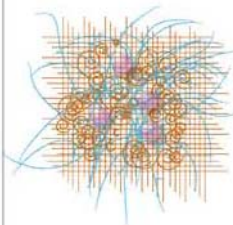
Géo-instable



La métropolisation s'opère en nuances sur l'ensemble du territoire national, selon une trame très fine, individuelle, et va jusqu'à créer de nouvelles centralités ou même concurrencer les centralités existantes. La mise en réseau des acteurs sociaux tend à se libérer de plus en plus des voisinages immédiats.

Dépolisation par

Hyper-individualisation

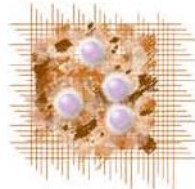


Un retrait de la ville est conduit par les groupes sociaux maîtrisant le mieux les technologies permettant de s'affranchir des contraintes urbaines matérielles et environnementales.

Des communautés se forment en marge des grands centres urbains, sur la base d'un refus hyperindividualiste de la mutualisation et des économies d'échelles procurées et permises par les effets de centralité.

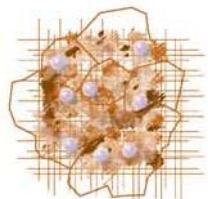
Les solidarités territoriales ne peuvent plus jouer sur la base d'une identité locale partagée, l'hyper-réticulation permet de construire des horizons urbains individuels composites et multiscalaires.

Répulsion et inefficacité



Une mauvaise gestion de la croissance métropolitaine des grands pôles urbains du territoire génère la fuite d'une partie de la population vers des périphéries où elles s'organisent en communautés autonomes. Cette fuite des « villes ratées » entretient par amalgame l'idéologie antiurbaine, condamnant durablement le développement urbain.

Effacement progressif de la puissance publique



Des régions trop petites ou trop grandes conduisent à des systèmes de péréquation territoriale à rendement négatif. Les inégalités n'étant pas compensées, les effets d'entraînement n'étant pas assez efficaces, l'aménagement régional s'oriente vers une dispersion des moyens dans des centres secondaires, affaiblissant le leadership de la capitale régionale et sa capacité de surproduction urbaine.

Conception / Réalisation : Datar | Territoires2040 - Patrick Poncet, Olivier Vilaga, Michel Lussault, Karine Hurel - 2011

Territoires2040 – "L'urbain-metropolisé français dans la mondialisation", scenario sketches

Source: Michel Lussault (2011) for Territoires 2040

Europe 2030 by CRPM (2002)³⁰

The ESDP, adopted in Potsdam in 1999 by the Ministers in charge of spatial planning, set as a priority the principle of a “Polycentric and balanced spatial development within the EU”. The present study was designed with a view to examining this concept in greater detail and imagining what kind of configuration this particular option might take in Europe’s peripheries, both in terms of content (policy options) and form (mapping scenario). The work was organised at European level under the coordination of the CPMR and its Maritime Peripheries Forward Studies Unit and was contracted out to a team of experts in charge of the national and thematic approaches, further enriched by a number of “test” interviews with public- and private-sector players.

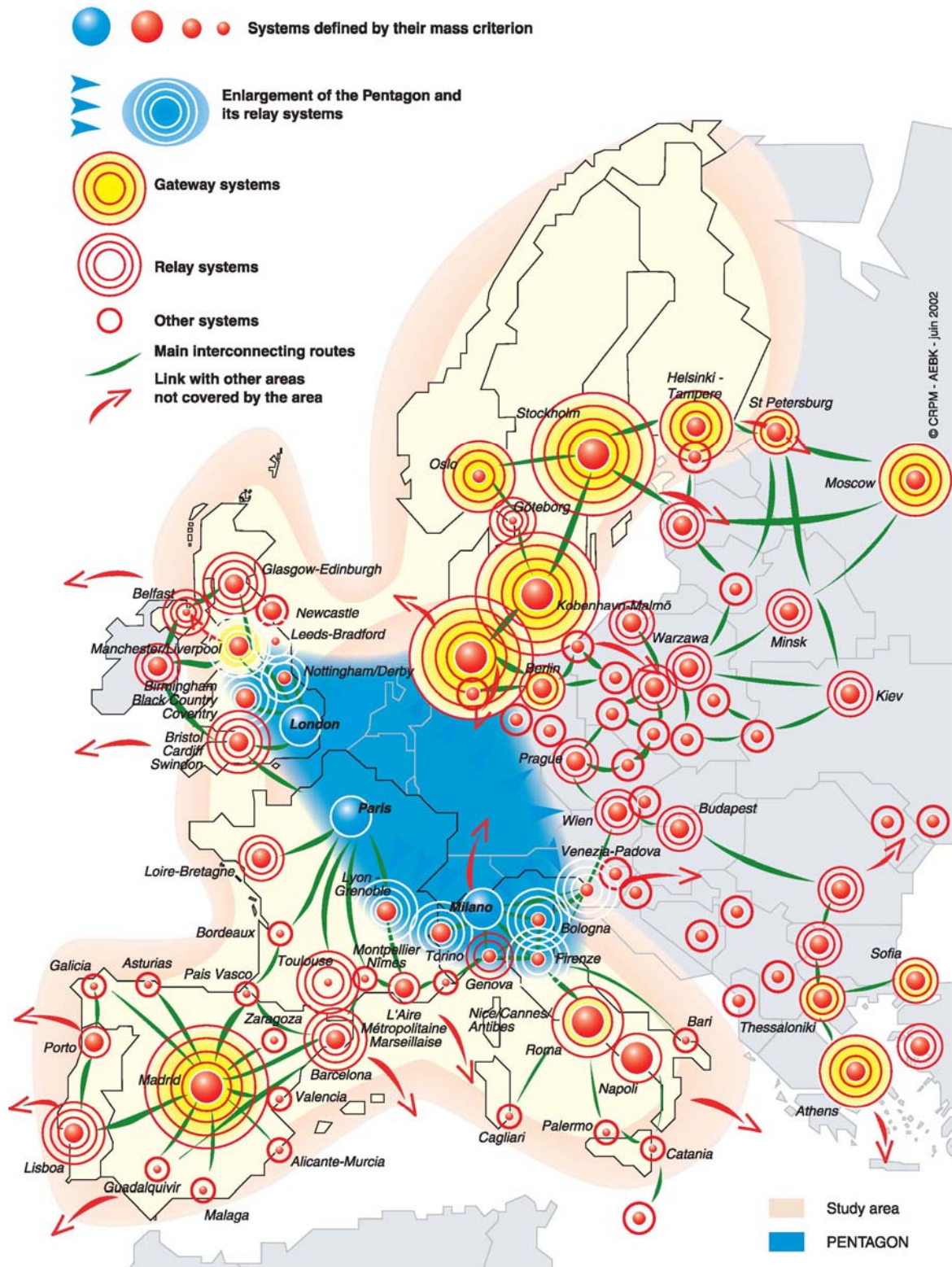
Two scenarios were established: i) a “straight-line” scenario, taking into consideration a continued progression of the various developments identified, without any specific public intervention in favour of a polycentric project at European level; and ii) a “voluntarist” scenario which, while remaining realistic, would result in the implementation within the next 20 or 30 years of a voluntarist policy in favour of this model, involving all spheres of government

Straight line Scenario

The “straight-line” hypothesis would lead quite quickly to a gradual expansion of the Pentagon, as it spreads its influence towards the centre of the UK, northern Italy, south-eastern France and the southern Baltic area. It would also see the emergence of a number of peripheral gateways such as Madrid and the North European capitals. Very few peripheral urban systems will emerge strongly outside of the extended Pentagon area. Only Lisbon, Barcelona, Toulouse and Göteborg seem to show a reassuring level of drive. A few promising urban systems located along the major transport corridors could emerge here and there, while a large number of dilemma or highly peripheral areas will continue to face a very uncertain future. Such a scenario would soon result in a reinforcement of polarisation and specialisation phenomena to the advantage of a limited number of peripheral urban systems, thus contributing towards increased territorial asymmetries.

³⁰ CRPM (2002) *Construction of a polycentric and balanced development model for the European territory 2030*.

31 - Illustrative Hypothesis "straight line" development



Europe2030 – Straight line development scenario sketch

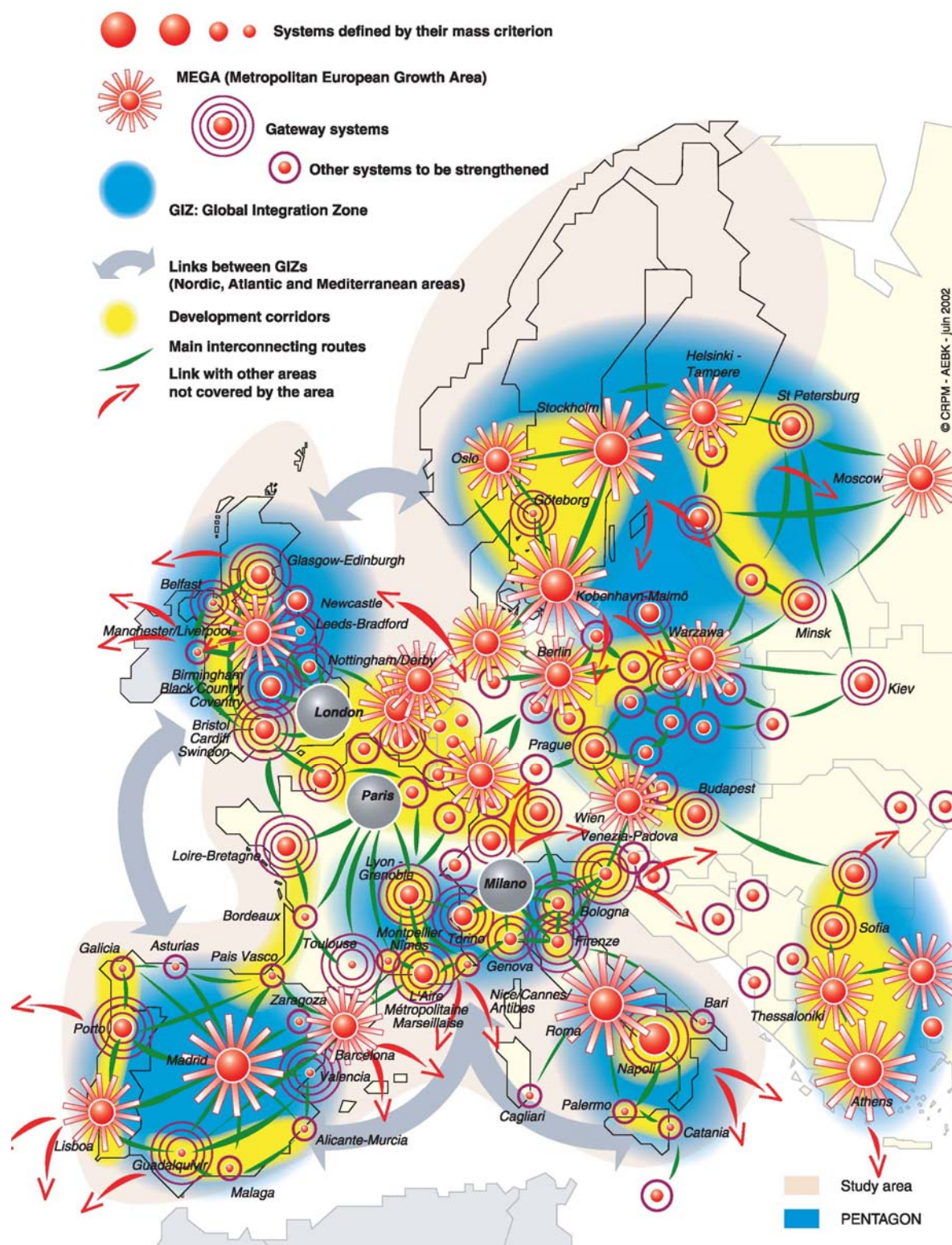
Source: CPRM 2002. Introductory Briefing Note on the relevant context material available to partners and contributors to the PolyMETREXplus Interreg IIIC project on the development of polycentric studies, visions and strategies for the spatial planning and development of the wider Europe. METREX, 2002

Long term voluntarist scenario

A voluntarist hypothesis in favour of redressing the balance of the European territory and developing polycentrism is based on a situation where all political levels – from European level, to national, regional and urban level – contribute towards structuring cooperation areas that are able to better polarise certain development factors. In order to achieve this, it would be necessary to work on three different scales. In order of priority, they are as follows:

- Strengthening of the “Metropolitan European Growth Areas” (MEGA). These are areas comprising the identified urban systems and their wider sphere of influence, and polarising factors of competitiveness. Priority would be given to encouraging cooperation at this level, which would require the strong intervention of a certain number of sectoral policies, a significant adaptation of the current regional policy, accompanying measures for national policies to break up the concentration of economic activity, and finally a strong involvement and cooperation on the part of the regional and urban areas;
- Accompanying measures to aid the emergence of new development corridors resulting from the networking and cooperation efforts between several MEGAs, mainly through transport policies;
- Progressive accompanying measures over a more long-term period for what the ESDP refers to as global economic integration zones (GIZ).

32 - Illustrative Hypothesis: long-term voluntarist development

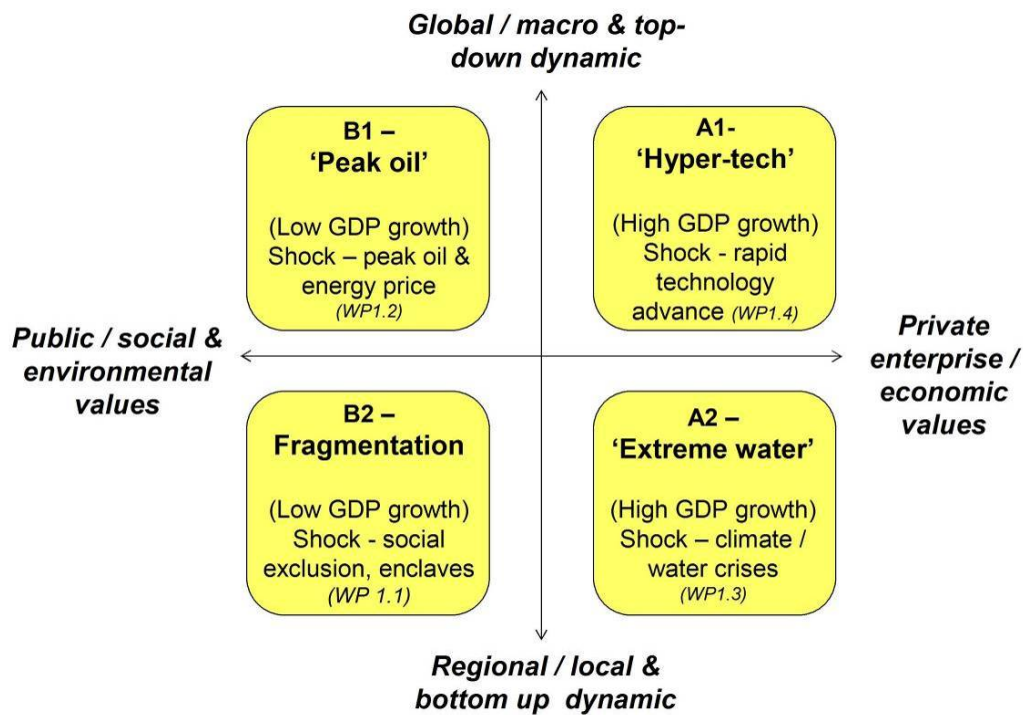


Europe2030 – Long-term voluntarist scenario sketch

Source: CPRM 2002. Introductory Briefing Note on the relevant context material available to partners and contributors to the PolyMETREXplus Interreg IIIC project on the development of polycentric studies, visions and strategies for the spatial planning and development of the wider Europe. METREX, 2002

Urban development scenarios by PLUREL 2025 (2008)³¹

Changing land use relationships within emerging rural-urban regions and their manifestation in phenomena such as urban sprawl and development of large transport corridors have long-lasting consequences for the regions' sustainability. The scenario framework should fulfil a number of key criteria for use within the PLUREL project, such as being manageable by limiting the number of scenarios, appropriate to the urban-rural issues addressed in PLUREL, and related to the concerns of end users.



PLUREL Urban Development Scenarios – Framework

Source: PLUREL 2008

High growth scenario (hyper-tech)

This describes a future world of rapid economic growth, global population that peaks in mid-century, and the rapid spread of more efficient technologies. Investment in research and development is high and nations share knowledge and pool resources in a global research market place. Energy prices decline because supply is driven by new developments in renewable energy production and nuclear fission. The shock concerns the rapid acceleration of ICT which transforms home and work as never before.

For peri-urban areas in Europe, this scenario is likely to see small »polycentric« towns and cities become even more popular. New transport technologies lead to more rapid journeys and the expansion of the commuting distances around towns and cities. This leads to peri-urbanisation and *metropolitanisation* of rural areas on a massive scale.

Drivers: rapid development in ICT leading to reduced commuting and transport needs, with no constraints on the location of new build.

³¹ By Kjell Nilsson , Thomas Sick Nielsen¹, Stephan Pauleit¹, Joe Ravetz and Mark Rounsevell, 2008

Self-reliance scenario (extreme water)

This describes a more heterogeneous world of self reliance and preservation of local identities. While the population increases, economic development is primarily regionally-oriented, and per capita economic growth and technological change are more fragmented and slower than in the other storylines. The shock here is subtitled *extreme water*, and this sees rapid increase in flooding, drought and sea level rise. A year does not go by without a major event, and in some cities and regions development is seriously constrained.

Peri-urban areas are strongly affected; affluent yet vulnerable city-regions such as London or the Dutch Randstad spend huge sums of money on defence and adaptation strategies. Population growth due to climate-induced migration puts more pressure on urban infrastructure and services.

Drivers: climate change reaches a tipping point leading to impacts including rapid sea level rise, flooding and water resource constraints.

Sustainability? scenario (peak oil)

This describes a future of environmental and social consciousness – a global approach to sustainable development, involving governments, businesses, media and households. Economic development is more balanced with rapid investment in resource efficiency, social equity and environmental protection. The »shock« in this scenario is driven by the real possibility of »peak oil«, that is, a decline in global oil production after reaching maximum production, leading to rapid rises in energy prices, with many social and economic effects.

For peri-urban areas, high energy prices have an enormous effect on location choices as transport costs limit commuting distances. Although tele working is encouraged, most people attempt to return to larger cities and towns, and more remote rural areas decline.

Drivers: an energy price shock leading to rapidly increasing energy and transport costs and consequent changes in mobility and trade flows.

Fragmentation scenario (walls and enclaves)

Europe sees a fragmentation of society, in terms of age, ethnicity and international distrust. The voter-strong elderly population becomes increasingly dependent on the younger generation, but the working-age population is disinclined to transfer their resources, with growing intergenerational conflicts.

The »shock« in this scenario will be an accelerated development towards fragmentation and social exclusion in Europe. The ethnic division of cities is driven by the increased in-migration of the working-age population from outside and within the European Union. Cities become more dispersed as younger migrants dominate city centres and older natives populate the outskirts and enclaves outside the cities – so that peri-urban areas become peri-society areas.

Drivers: low growth and accelerated fragmentation leading to behavioural shifts within society.

	A1	A2	B1	B2
Ethnographic parameters	'Hyper-tech'	'Extreme water'	'Peak oil'	'Fragment ation'
	<i>globalizing / privatizing</i>	<i>localizing / privatizing</i>	<i>globalizing / public</i>	<i>localizing / public</i>
Define	Our landscape & society is defined by market values on a global scale	Our landscape & society is defined by market activities at the local & regional scale	Our landscape & society is defined by public values on a top-down basis.	Our landscape & society is defined by community-based values and activities on a local basis
Relate	Social relations are organized on a global market exchange basis, even within households and communities	Social relations become more localized, but stratified by value, status, ethnicity and culture	Social relations are organized by EU / global values: diversity, empowerment and dematerialization.	Social relations are community based, but segmented by race, class, age, lifestyle and ethnicity.
Connect	Advanced ICT enables virtual immersive connections: coupled with advanced high speed responsive transport modes.	Both virtual & physical networks are slow and unreliable, with reduced coordination & investment.	Virtual & physical connections are organized top-down, with large investment in public transport, and large ICT firms which are publicly owned.	This society is well connected within local groups, but fragmented between communities. Web 2 & 3 is the basis for virtual & transport networks, but seems to create many divisions.
Create	Supply chains are highly organized and integrated at both global and local levels	There is a revival of small businesses, as the stagnation of the global economy makes room for local entrepreneurs	Employment is organized at global level with public-private partnership firms: supply chains are integrated & responsive to social needs.	Many firms are local cooperative or social enterprises with complex supply chains and trading systems. Low production efficiency is balanced by better fit to demand.
Consume	Materialist consumption as a status chasing activity, but with the benefit of advanced technology.	Materialist consumption is defensive and risk-avoiding, often with yesterday's technology	Personal consumption is geared to community values, with narrowing gaps between rich and poor.	Much consumption is within the household or community, with less materialism and more socio-cultural meaning.
Other: implications for the peri-urban	The peri-urban becomes segmented by carefully graded differences in value & status, coupled with risk & opportunity.	The peri-urban is a chaotic zone of hazardous areas, private appropriations and enclaves, with increasing floods & storms, while planning & investment reduces.	The peri-urban is carefully planned at national and regional level, with green infrastructure & multi-functional land for food, biodiversity & climate adaptation.	The peri-urban is the ideal space for self-contained communities to grow, with many functions of food, energy, water etc, in an archipelago of enclaves.

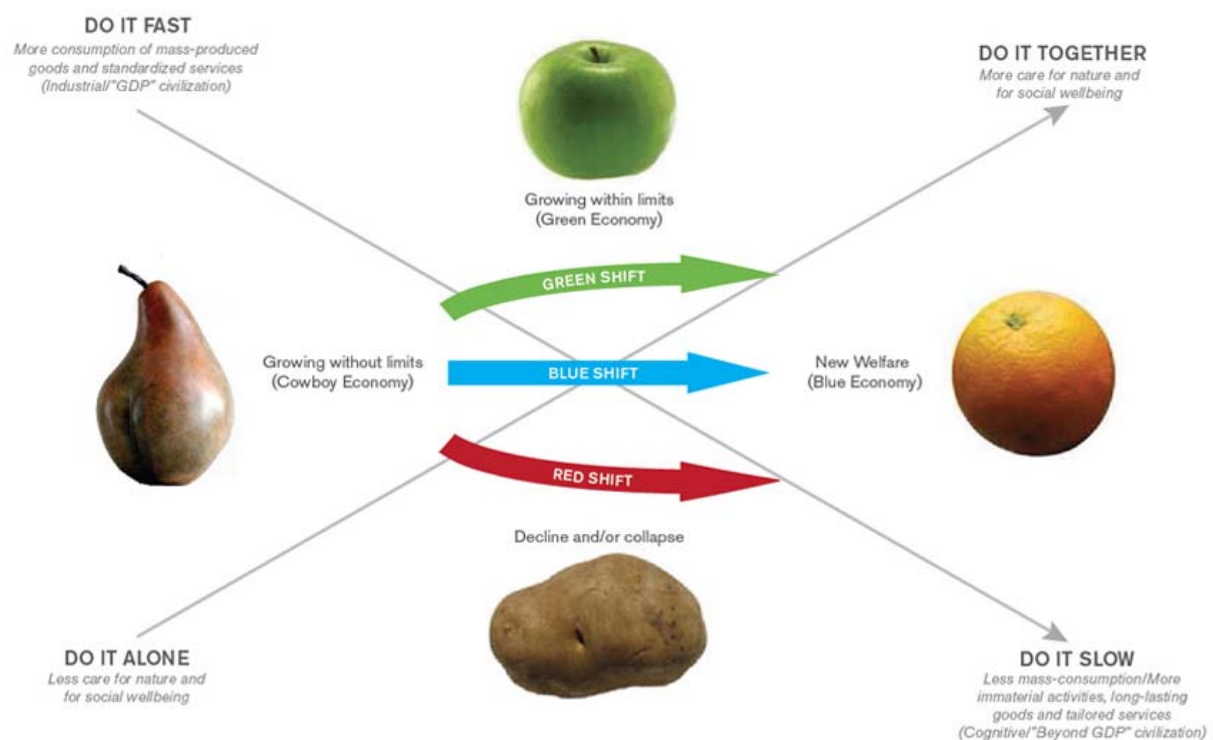
PLUREL Urban Development Scenarios – Ethnography's parameters by scenarios

Source: PLUREL 2008

PASHMINA Scenarios 2030 - 2050 (2010)³²

PASHMINA project's objective is to model global scenarios based on changes of paradigm in long term time perspective (2030—2050) derived from new behavioural trends in Earth societies, especially considering the challenges of energy provision, climate change and land-use equilibrium. The project involves a large number of parties and several different models and sub-models studying different dimensions of the problem, like the evolution of cities, of rural and natural environments, or the evolution of transport.

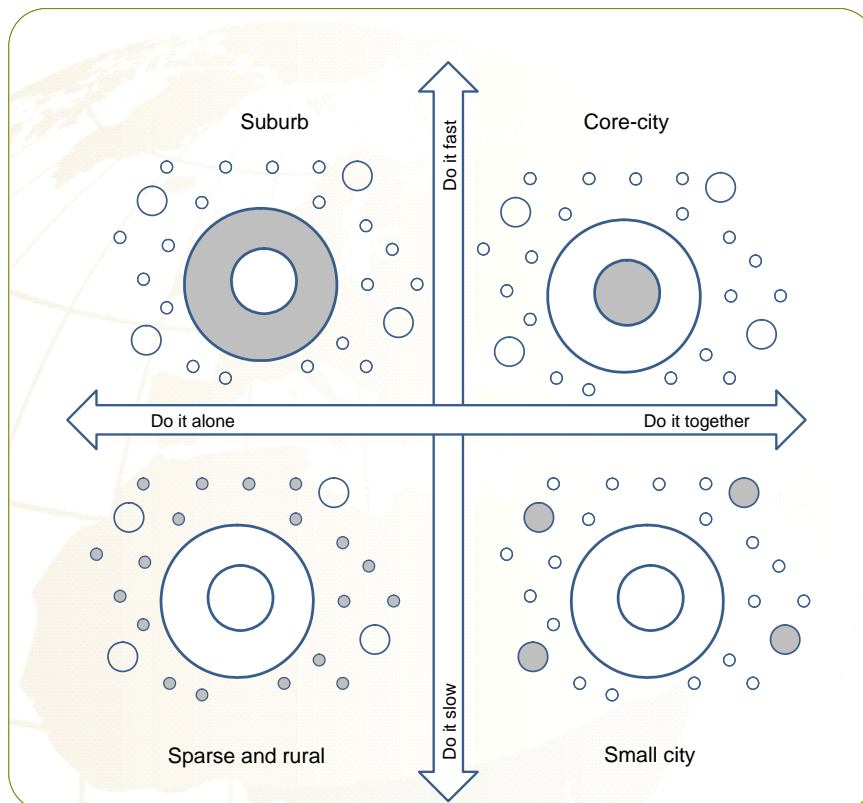
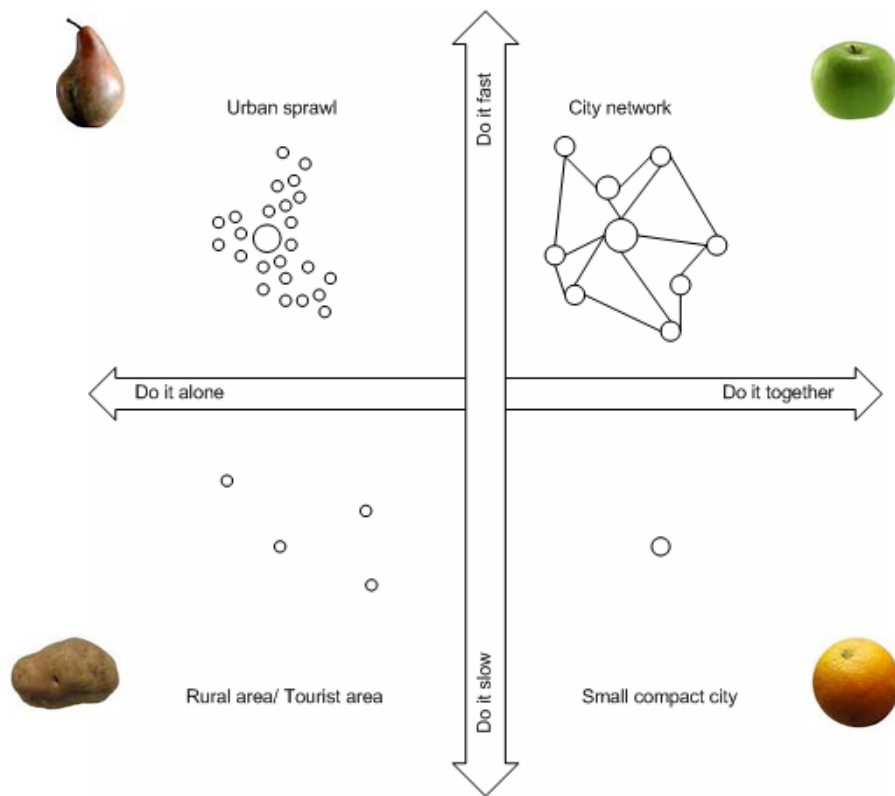
PASHMINA defined 4 scenarios associated with 4 different fruits/vegetables (pear, apple, orange and potato). Scenarios had strong consequences for spatial development and urbanisation, as portrayed in the following figures. Transitions were considered as means of evolving over time from one scenario onto another.



PASHMINA – Scenarios in a speed (economy) VS concentration (social) 2D space, and possible transitions between them

Source: PASHMINA 7FP 2010

³² ISIS, Mcrit et al. for PASHMINA 7FP project (2009-2013). www.pashmina-project.eu



PASHMINA – Spatial implications of different scenarios
Source: PASHMINA 7FP 2010

Growing beyond limits Scenario: the Pear World paradigm.

Growing beyond limits scenario features the strengthening of corporate capitalism and market mechanisms, pursued globalization of goods and financial markets, a new technological wave in the form of ICT, nano-technologies and biotechnologies.



The technological revolution

The technological revolution allows for clean energy production, health innovations, environmental and green techs... globally relieving pressure on environment. While energy consumption will still grow at a high pace (even if energy intensity will continue to progressively decline), released emissions per unit of energy production will fall down increasingly faster due to technological innovation. Transport will still grow along with economy, invalidating the decoupling paradigm, but this does not matter anymore as vehicles have become clean and emissionless.



Irregular shape, evoking north-south disequilibriums

The pear is irregular in its shape evoking disequilibriums in different parts of the world, both economically and socially. Some countries, regions, even neighborhoods will keep progressing economically while others will have substantial difficulties to develop. Countries *growing beyond limits* have GDP annual growth rates ranging between 3% and 6% depending on the level of maturity of their economies, while lagging countries show very fluctuant instable patterns of growth, with poor average rates over time.



Soft and smooth pear peel evoking cultural uniformity

A close look onto the surface of a pear shows a uniform smooth peel landscape, evoking progressively uniform values and habits all over the world. Globalization and increased mobility of people (migrations, global business, leisure travel) increase the trend towards social homogenization of world societies. Minorities helplessly see their identities diluted, while global homogeneous values spread around.

Growing within limits: the Apple World paradigm.

The Growing within limits scenario assumes that a low-carbon economy and adequate biodiversity protection can be achieved with currently identifiable technologies and at moderate economic costs without damaging opportunities for human development, provided that a number of barriers to achieving the right policy conditions and institutional settings are overcome.



The driving forces

The social democratic revolution

The *Global Green New Deal* is a set of new institutional conditions that are created to spur off the shift towards fundamental transitions that will help bring a "green" economy. Regulations as well as citizen behavioral changes contribute to decrease progressively energy intensity, as societies turn from being mostly consume driven to being mostly service and knowledge oriented. GDP growth therefore becomes increasingly independent from energy demand. Innovation contributes to reducing GHG emissions from power generation as well. Climate change threat progressively banishes. Dietary changes and increased efficiency of agriculture relieve land claim pressure.



The world shape

Regular shape, evoking a more equilibrated world

The apple is spherically shaped, evoking a more equilibrated world, both economically and socially. Poor nations increase their wealth in a steady consistent way, and steered development cycles generate low social disparities. Rich nations devote significant aid to developing countries, especially through skills, knowledge and technology transfers. Countries growing within limits have average GDP annual growth rates ranging between 1.5% and 3%, decreasing as they become more mature economies.



The human landscape

Soft and smooth apple peel evoking cultural uniformity

A close look onto the surface of an apple shows a uniform smooth peel landscape, evoking progressively uniform values and habits all over. Multilateral governance and interregional cooperation promote good understanding among different cultures, increasing the trend towards progressively shared social and cultural values, diluting minority identities in favor of common progressive ideals.

New welfare: the Orange World paradigm

The present measurement of growth is abandoned in the New welfare scenario. A new frame is set up to account features of wellbeing "beyond GDP", including self-production and services rendered by nature, taking into account the realities that do not pass through the market or get irrelevant evaluation by a market. A new techno-economic and social paradigm emerges



Welfare beyond economic growth

The *New Welfare* scenario is the result of a deep behavioral social mutation, with people becoming more concerned about wellbeing and quality of life than economic wealth. Hedonism mixes up with new "social innovative" mechanisms to satisfy new social community needs. Material consume is reduced; barter becomes common. Info, digi, cyber, holo and other immaterial high-tech technologies are extremely successful, while mechanical elements progressively substitute energy driven mechanisms: it is the age of the crank, the spring, the pedal and the ladder. New eco-cultural paradigms emerge, changing the human-nature interaction, from "exploitation" to "gardening". Education and research are at the center of social values.



Regular shape, evoking an equilibrated world

An orange is spherically shaped, evoking a world that tends to progressively harmonize different regions, becoming more equilibrated in the mid and long term. As there will be mostly small scale local economies, highly self-sufficient but well connected to networks, societies will more easily steer stable economic frameworks with little perturbations. The economy will be operating with the minimal levels of production and consumption necessary for a high quality of life, using new GDP measures where indicators such as quality of life and ecosystems' health will gain predominantly weight.



The wrinkled orange peel evoking cultural diversity

A close look onto the surface of an orange shows a soft but wrinkled peel, non homogeneous but still harmonious. This is the social spirit of the *New welfare* scenario: a world recognizing and promoting differences on communities as an enriching element to society, a rich mixed salad with an "earthly" dressing. People's attachment to institutions and nations, which was one of the bases of industrial organization, is not essential anymore. There will be mostly small scale local communities, connected to the rest of the world through social networks. Multi-level governance with bottom-up participatory approaches will largely diminish national and global powers.

Turbulent decline: the Potato World paradigm

The key question with respect to turbulent decline is whether the growth in material flows could remain within the limits for climate change, natural resources' availability, global ecosystems' health and biodiversity loss, as well as help to alleviate global poverty. The answer would be negative, and the world is set to collapse.



Failure to sustain global economic growth

Market forces are dominant. Most services are privatized or franchised. Energy shortages, lack of innovation, and low emotional social conditions make service providing inefficient at all scales: services to people, to enterprises, mobility services and goods production. R&D budgets are almost residual. Energy intensity breaks its decreasing trend and starts increasing after 2030, implying that more energy is needed to produce single units of GDP. Technologies become old, but investigation is mostly deployed to new "evading from reality" techs such as emotion controllers or virtual reality devices. Both inefficient transport vehicles and inefficient power generation increase emission factors, aggravating the problem of climate change. Polluted environment and toxic atmosphere accelerate biodiversity destruction.



The world shape: very irregular shape evoking highly fragmented world

The potato world is irregularly shaped, evoking a much disequilibrated world, both economically and socially. It is a world in crisis. Protectionism in different regional economies induces disparate economic evolutions for different nations and continents. Disparities become more evident. There is a global draw back in the global economy, with fluctuations and unstable regimes. Wealthier people get in control of governments in some parts, military in some others, even religious leaders, with many democracies tending to evolve towards lobbocracies and autocracies. Average annual GDP growth rates are negative in most regions, but in some, economic growth is extremely high (over yearly 5%).



The human landscape: rough potato skin evoking the importance of differences

A close look onto the surface of a potato shows a rough skin with wrinkles, with different local topographies from one point to another. These differences in local topologies evoke a world where the social setting stays mostly heterogeneous. Everyone goes back to his own corner of civilization. Protectionism becomes the common rule, flows of people and information become more difficult, and as a consequence, societies tend to enforce their identities and sometimes they are confronted to their neighbor's, generating conflicts. It is a world of nations, micronations and city-states. The spiritual dimension gains importance at the center of people's life, even if believes are in own personal "inspirations" rather than in "God".

www.espon.eu

The ESPON 2013 Programme is part-financed by the European Regional Development Fund, the EU Member States and the Partner States Iceland, Liechtenstein, Norway and Switzerland. It shall support policy development in relation to the aim of territorial cohesion and a harmonious development of the European territory.