

ESPON 2006 Programme
Tender
ESPON 3.2
“Spatial Scenarios and Orientations in Relation to the ESDP and
Cohesion Policy”

Submitted by
Institut de Gestion de l'Environnement et d'Aménagement du Territoire

30th November 2003

Contents

I	The Team	4
1	Technical information about the project leader	5
1.1	Legal status	5
1.2	Year of foundation	5
1.3	Name of legally responsible person	5
1.4	Number of Staff	5
1.5	Proof of financial capability	5
1.6	Proof of technical capability: Projects elaborated for international, European, national, regional and/or local authorities since 1997 as well as other information interesting from the view of the tenderer . . .	5
2	The Transnational Project Group	7
2.1	Central project group	7
2.1.1	IGEAT - Brussels, Belgium - Project leader	7
2.1.2	Agence Européenne “Territoires et Synergies” (AETS) - Strasbourg, France - Project Co-leader	9
2.1.3	UMS 2414 Réseau Interdisciplinaire pour l’Aménagement (RIATE) - Paris, France	10
2.1.4	Bundesamt für Bauwesen und Raumordnung (BBR) - Bonn, Germany	11
2.1.5	Centre for Regional Studies of the Hungarian Academy of Sciences (CRS - HAS) Pécs - Budapest, Hungary	12
2.1.6	Dep. of Management, Economics and Industrial Engineering, Politecnico di Milano (DIG) - Milano, Italy	13
2.1.7	MCRIT - Barcelona, Spain	14
2.1.8	Nordregio, Nordic Centre for Spatial Development - Stockholm, Sweden	15
2.1.9	Centre for Urban Development and Environmental Management (CUDEM), Leeds Metropolitan University, Leeds, United Kingdom	16
2.1.10	Ruimtelijk Planbureau (NISR) - Den Haag, Netherlands	17
2.2	Experts	18
2.2.1	Department of Urban and Regional Planning, National Technical University of Athens (NTUA) / School of Architecture - <i>Athens, Greece</i>	18
2.2.2	ETH Lausanne, Laboratoire Dynamiques Territoriales (LADYT), Ecole Polytechnique Fédérale de Lausanne (EPFL) - Lausanne, Switzerland ETH Zürich, Network City and Landscape (NSL, former ORL-Institute), Institute for Spatial and Landscape Planning (IRL) - Zürich, Switzerland (ETHs)	19
2.2.3	Centrum Europejskich Studiów Regionalnych i Lokalnych (EUROREG) - Warsaw, Poland . . .	20
2.2.4	Cuguat-TIGRIS, Department of Geography, « Alexandru Ioan Cuza » University - Iasi, Roumania	21
2.2.5	Laboratoire “Dynamique et Planification Spatiales” (DPS), Faculté des Sciences Humaines et Sociales, Université de Tunis - Tunis, Tunisia	22
2.2.6	Institut für Wirtschaftsforschung (IWH) - Halle, Germany	23

3	Organisation of the TPG and division of tasks	24
II	The Research Project	25
4	Data synthesis, trend analyses, projections and scenario building	28
4.1	Preliminary assessments	28
4.1.1	Assessment of available data	28
4.1.2	Assessment of available scenarios	30
4.1.3	Assessment of scenario building techniques	30
4.2	Trend analyses, forecasts and projections	32
4.2.1	Consolidation of existing trend analyses through rigorous application of statistical (multivariate) methods	32
4.2.2	Complementary and global analyses	35
4.3	Qualitative analyses of driving forces	36
4.3.1	Analysis of economic, societal and environmental forces shaping the EU territory	37
4.3.2	Territorial impacts of public policies and of their governance	38
4.4	Set of integration tools	39
4.4.1	MASST Model :	40
4.4.2	The KTEN Transport Model	41
4.4.3	Towards a European Territorial Cohesion Index (ETCI)	42
4.4.4	Executive Policy-Simulation Models (Meta-models)	42
4.5	Scenario building	44
4.5.1	The significance of scenarios in public policies related to spatial development	44
4.5.2	The various types of scenarios	44
4.5.3	Concepts and approaches to be used in the elaboration of scenarios	45
4.5.4	Possible scenario ideas	46
4.5.5	Methodological approach to scenario building	47
5	Consultation and communication	48
5.1	Consultation, validation, feedback, consensus-finding	48
5.2	ESPON knowledge and communication tool	50
6	Coordination of the ESPON research effort and platform	51
6.1	Networking and scientific coordination of the entire ESPON platform	51
6.2	Management and enhancement of ESPON Database and ESPON GIS	52
6.2.1	Follow up of work undertaken under ESPON 3.1	52
6.2.2	Improvements to be carried out under ESPON 3.2.	52

7	Policy recommendations	54
7.1	Elaboration of policy recommendations for future EU and national spatial development policies . . .	54
7.2	Elaboration of recommendations on the future of the ESPON platform (including ESPON Database and GIS) and a European research network on spatial planning	55
8	Budget	56
A	Territorial data and information available in the ESPON Studies	57
B	Expertise in the TPG by topics in the offer	60
B.1	Data synthesis, trend analyses	60
B.2	Analyses of driving forces	62
B.3	Scenario methods, scenario building	65
B.4	Consultation and Communication	68
B.5	Coordination of the ESPON research effort and platform	69
B.6	Policy recommendations	69
B.6.1	Elaboration of policy recommendations for future EU and national spatial politics	69
B.6.2	Elaboration of recommendations on the future of the ESPON platform (including ESPON Database and GIS) and a European research network on spatial planning	71
C	Global flow chart and time chart of the project	72
D	CVs of all TPG members, additional TPG member description and letters of confirmation of all TPG members	72

Part I

The Team

Introduction

The general goal of preparing the grounds for a reviewed ESDP policy document forces ESPON to cover a very large field of themes in a very large geographic space. This is reflected in the composition of the different research teams working on the already existing projects. Project 3.2, through its overview and synthesis character, demands the most elaborate cooperation between different research fields and locations. The present group reflects this both geographically and thematically.

The team contains four ESPON contact points (IGEAT, UMS RIATE, BBR, DIG) and covers 14 countries, of which two acceding countries (Hungary, Poland), one candidate country (Roumania), Switzerland, and one Southern Mediterranean country (Tunisia). Members of the team have experiences in diverse fields necessary for the solid completion of the tasks of project 3.2 and, thus, complement each other very well.

In order to ensure the necessary efficiency in spite of such a large group, it will be organised in two layers: a central project group (itself divided into several working groups) and a group of experts whose role it will be to validate and complement the work of the central group. IGEAT, Brussels, will take the project leadership, supported in this task by AETS, Strasbourg.

The following sections will first introduce technical aspects concerning the project leader (section 1), then the different scientific teams (section 2) and, finally, the internal organisation and division of tasks between the teams in relation to the scientific project itself (section 3).

1 Technical information about the project leader

Address:

Institut de Gestion de l'Environnement et d'Aménagement du Territoire
Université Libre de Bruxelles
Prof. Christian Vandermotten
C.P. 246
Boulevard du Triomphe
B - 1050 Bruxelles
BELGIUM

Tel.: +32-2-650.50.72

Fax: +32-2-650.50.92

e-mail: cvdmotte@ulb.ac.be

1.1 Legal status

IGEAT is an institute of the Free University of Brussels (ULB) and as such has the status of a department (“faculté”) of the University.

1.2 Year of foundation

IGEAT was founded in 1993 based on pre-existing research units.

1.3 Name of legally responsible person

Pierre de Maret
Recteur de l'Université Libre de Bruxelles

1.4 Number of Staff

60 researchers from PhD students to senior professors.

1.5 Proof of financial capability

Financial turnover (of the university) in 2002: 148.883.088 Euros.

See (paper) annexe for university accounts of last three years and proof that social security has been paid.

1.6 Proof of technical capability: Projects elaborated for international, European, national, regional and/or local authorities since 1997 as well as other information interesting from the view of the tenderer

The IGEAT's main activity in terms of research is consultancy work for authorities at all scales, from local to European and it has thus been able to accumulate experience in project management and research coordination, including in an international, i.e. intercultural setting. On the European level, the Institute

- has recently been appointed ESPON Contact Point for Belgium;
- is Interreg3B NWE/ENO Contact Point for the Walloon and Brussels Regions;

- has been and is responsible for several work packages within different European projects (ESPON 1.1.4, COMET);
- was Lead Partner in the MIRE project;
- was Lead Partner in the SPACE-Euroregion project;
- was coordinator of the SOS - Euroregion project;

Within the Walloon Region Permanent Conference on Territorial Development (CPDT) the Institute plays an important role, heading several of the working groups.

The IGEAT has organised several international (and national) colloquia on urban economic development, on sustainable development, on local development in Walloon and on the role of geography in society and recent mutations in spatial organisation of world regions. On the local level, on behalf of the Brussels Regional Government, it has recently organised a brain storming session concerning a local urban development project, involving about 100 participants from all parts of society.

Moritz Lennert who would be the project coordinator is perfectly fluent in German, French and English and can communicate in Spanish and Dutch.

The Institute can also rely on the University's central administrative departments which handle large numbers of contracts every year, including their financial management and direct contact with the European managing authorities.

Section in offer	Working groups
4.1.1	IGEAT, UMS RIATE, BBR, DIG, NISR
4.1.2	CSR, AETS, EUROREG
4.1.3	CUDEM, NISR, AETS
4.2	DIG, UMS RIATE, IGEAT, BBR, MCRIT, ETHs, NTUA, TIGRIS, DPS, NISR
4.3	NORDREGIO, NISR, EUROREG, CSR, ETHs, TIGRIS, DPS, IWH
4.4	MCRIT, DIG, UMS RIATE, IGEAT
4.5	AETS, MCRIT, CUDEM, NISR, CSR, NORDREGIO, NTUA
5	CUDEM, NISR, MCRIT, NORDREGIO, UMS RIATE
6	IGEAT, BBR, AETS, UMS RIATE
7.1	IGEAT, AETS, MCRIT, NORDREGIO, ETHs, NISR, IWH
7.2	IGEAT, BBR, UMS RIATE

Table 1: Working groups according to the tasks defined in part II

3 Organisation of the TPG and division of tasks

As mentioned in the introduction, the TPG will function in a two-layer approach with the central project group and the experts for validation and complementation. Depending on the different tasks the group will further be divided into smaller working groups, allowing efficient preparation of work that will then be submitted to the whole TPG.

Table 1 show the potential division into different work groups according to the tasks defined in part II. Obviously, every partner will be solicited for input on most tasks, but these groups will do the bulk of the respective work, to be validated by the others. Some of the members of the group of experts offer particular expertise on subjects not specifically mentioned, but nonetheless very important in the context of the project, such as the enlargement process, the South Mediterranean, the Alpine region, etc.

All members of the TPG and specifically all experts will play an important role in the scientific validation of trends and scenarios developed by the respective working groups.

Part II

The Research Project

Introduction

ESPON 3.2 has two main objectives

1. Synthesize all data and information collected in the ESPON projects and other transnational research efforts in order to offer spatialized scenarios on possible and desirable futures.
2. Coordinate the ESPON research effort in order to develop sustainable tools allowing the creation of a research network / program on European territorial planning.

These two objectives allow for a fair amount of synergies between them and so cannot be clearly separated from another. However, for practical reasons, they are treated as two distinct strands. Both will, at the end, feed into policy recommendations for spatial policies as well as for research policies. Eventually, depending on decisions at political level, a reviewed and proactive ESDP policy document embracing the enlarged territory of the European Union as well as further development within Cohesion policy in relation to objectives for Community support and intervention should be able to find support in using operational results from project 3.2.

The project is divided into four main parts. The first and main part concerns the actual scientific effort leading from a synthesis of the currently available data and information to different types of scenarios, by going through quantitative and qualitative trend analyses and an effort to integrate the information gathered into a global view of European spatial dynamics (section 4). The second part contains the consultation and communication work that is absolutely necessary if this project is to be of any practical use to policy makers (section 5) and if its results are supposed to have an wider impact than just within the ESPON programme. Another very important task for project 3.2 is the coordination of the entire ESPON research effort and the continuation and enhancement of the ESPON platform, including the ESPON Database and GIS. This is covered in section 6. Finally, the main aim of the present project being the elaboration of actual policy recommendations, both for future European spatial policy and for future European spatial research, section 7 provides a short reflection on these issues. In order to give an idea of the relative weight of each of the parts of the project, the time chart in annexe C provides a provisional time schedule.

This division into four sections is somewhat artificial as the different tasks obviously overlap and interdepend (see global flow chart in annexe C). This also implies that the relation between the terms of reference and this project may not always be easy to establish at first reading. Table 2 therefore provides an overview of these relations. This clearly shows that all of the specific objectives enumerated in the terms of reference (pp. 5-6) are met within this project.

Objectives (pp. 5-6 of TOR)	Section in offer	Lead partner
survey, assess and classify scenario techniques	4.1.3 4.1.2	CUDEM CSR
define major driving forces affecting territorial development and cohesion, select most significant socio-economic trends	4.1.1 4.2.1 4.2.2 4.3.1 4.3.2	IGEAT UMS RIATE DIG Nordregio NISR
develop alternative and distinctive scenarios	4.1.3 4.5	CUDEM AETS
explore transnational spatial visions	4.1.2	CSR
examine results in light of ESDP policy orientations and options	4.3.2 7.1	NISR IGEAT
prepare scenarios in a cyclical and dynamic way allowing the MC to take active part	4.5 5.1	AETS CUDEM
prepare and support a communication process	5.1 5.2	CUDEM MCRIT
ensure continuation of the guidance on technical and scientific level of the ESPON 2006 Programme	6.1 6.2	IGEAT BBR
Further develop common ESPON platform	6.1 6.2	IGEAT BBR
Bring added value to the results of individual projects	6.1	IGEAT

Table 2: Relation between objectives defined in TOR and sections in this offer, as well as lead partners for each task

In the same logic, the following table allows an easy understanding of which of the project tasks will deliver the expected results as defined in the terms of reference (pp. 7-9). For detailed description of the deliverables and ongoing production per task, see at the end of the individual sections.

Date	Deliverables (pp. 7-9 of TOR)	Section
April 2004	Overview of existing examples and assessment of alternative methods for scenario building in relation to the development of territories at European, transnational, national scale as well as for typologies of regions, such as metropolitan urban regions and regions with a territorial handicap	4.1.2 4.1.3
	Classification of scenario methods, including analysis of different methodological options, covering both prospective and proactive scenarios, their strong and weak points, an overview and assessment of main driving forces selected, data requirements as well as policy orientations, implementation strategies, governance issues and communication strategies related to the cases examined	4.1.3
	Recommendations for the next phase of the scenario process, taking into account the elements mentioned (under b) including the first sketches of the main features and driving forces of the scenarios as well as first ideas on a communication strategy in order to involve the MC in an informal debate on prospective/trend scenarios and orientations	4.1.3 4.3.1 5.1 4.1.1
	Report on progress made and envisaged concerning scientific guidance and the common platform as well as the ESPON data base and mapping collection. Tasks related to scientific coherence and further development of ESPON tools will start only as from January 2005 as they are currently undertaken by project 3.1. The project is therefore asked to ensure a smooth transition of these tasks during end 2004	6.1 6.2

Date	Deliverables (pp. 7-9 of TOR)	Section
	Consensus on indicators and necessary data after a precise analysis of the availability and comparability of data within the ESPON Data Base and at Community level. The project should also indicate how, for these analyses, the results of the study programme and the results of the ESPON projects in course, in particular under priority 3.1, should and will be taken into account. This task should also define the appropriate geographical levels and technology required for data collection, modelling and cartographic illustrations, taking into account the availability of the data.	4.1.1 6.2
March 2005	Draft alternative prospective/trend scenarios and orientations including a reference scenario. The scenarios shall in particular cover the results of projects under priority 1 in an integrated way and as well include a global dimension	4.2.1 4.2.2 4.3.1 4.5
	Draft alternative proactive scenarios and the EU policies to be addressed in a potential realisation of each individual scenario, including a first identification of potential contrasting orientations on the implementation of spatial objectives into the existing EU policies - from analytical tools to policy measures; the proactive scenarios shall in particular take territorial impact assessments of projects under priority 2 into account and as well include a global dimension	4.3.2 4.5
	First ideas and policy recommendations for a possible use of the developed scenarios and orientations in the European process	7.1
	Tools for the identification of threats and potentials for a more balanced territorial development such as indicator lists, databases, mapping methods covering all themes in a comprehensive and integrated way	4.4.3 4.4.4
	Proposal on a communication strategy ensuring a relevant informal debate on prospective/trend scenarios and orientations	5.1 5.2
	Report on progress of scientific guidance and common platform as well as development and maintenance of the ESPON data base and mapping collection (taking over tasks and responsibility of project 3.1)	6.2 6.1
	Final draft prospective and proactive scenarios in written and visual form, which can ensure the understanding and communicate the importance and potential of a territorial dimension in the development of the enlarged EU	4.5 4.4.4
January 2006	Final draft policy recommendations for a possible use of the developed scenarios and orientations in a process up-dating the ESDP covering the enlarged European territory, including suggestions to the Cohesion policy at EU level supporting territorial cohesion	7.1
	Progress report on the implementation of the communication strategy and proposal for further dialogue and information activities	5.1 5.2
	Progress report on the scientific and technical guidance of ESPON projects, including methodologies, indicators, typologies, etc. developed and the state of the art of the ESPON Data Base, Map Collection and GIS	6.1 6.2
	Final prospective and proactive scenarios including cartographic illustrations and relevant material for communication	4.5 5.2
October 2006	Final recommendations for policy orientations in line with the ESDP and 3CR and the Lisbon Strategy. Recommendations should also take into account sustainable development aspects	7.1
	Final synthetic report on the scientific platform for the ESPON 2006, including indicators, methodologies, concepts, typologies and data, on tools developed, including the ESPON Data Base and ESPON GIS, followed by recommendations for further improvements in a continuation of a European research network in the field of spatial planning and territorial development	7.2

4 Data synthesis, trend analyses, projections and scenario building

The elaboration of territorial scenarios with integrative character requires a large amount of information and knowledge. This information might have:

- a synchronic character: it refers to the description of a situation at a certain time (for instance the present period or a specific year in the past), including the interactions between factors and variables
- or a diachronic character, showing the evolution of a number of factors or variables during a period of time (short or long range trends).

This information constitutes the so-called “basis” of prospective thinking or scenario writing. The first step of ESPON Project 3.2. will, therefore, be the construction of a “basis” for the scenarios.

However, data or information concerning previous trends is not enough to define or evaluate consistent scenarios. In order to do this, we first need to gain an understanding of the complex interrelations between socioeconomic and technological driving forces and the potential impacts of alternative policies. Needless to say, there is no comprehensive theory available, nor are there any well calibrated mathematical models that are able to forecast human and social behaviour. Acknowledging that the intuition of experts is often surpassed by the complexity of the problems, the approach we propose is a balance between a qualitative definition of scenarios and a scientific validation by the use of quantitative models based on precise data, whenever possible.

At the beginning of the project, the team will start by looking at already existing studies on scenarios in Europe and other relevant areas of the World, as well as regarding trends for key sectors. We will proceed to a detailed assessment of data needs and scenario building methodologies. Data gathering will be limited as much as possible to the ESPON projects (see annexe A for a list of data collected or elaborated in these projects), and complemented if necessary, notably regarding past evolutions and trends. Some refinement of data structures will be made to integrate the time dimension to already existing data structures and to allow the development of a sustainable database for future research.

The information available will be analysed and presented in a form allowing a discussion on the future of the European territory. Thus it will be possible to provide commented classifications as decision aid for the discussions with the ESPON MC.

4.1 Preliminary assessments

4.1.1 Assessment of available data

One of the first tasks for ESPON 3.2 will be to analyse which data is available and how to structure this data in order to render it usable in a coherent and comprehensive form. The selection will begin with an assessment of the data according to several criteria, such as their availability throughout the entire ESPON territory and at sufficient spatial resolution, their comparability across the different regions, their dependencies of other indicators, etc. It will also be necessary to structure the data in a sustainable, future-oriented way.

The information which is useful for the ESPON program (in general) and for the building of political scenarios (in particular) can be described today as a set of coherent databases in which the three following important dimensions are more or less developed:

1. Thematic dimension (I)
2. Spatial dimension (S)
3. Time dimension (T)

Generally speaking, it seems impossible to develop one of those dimensions without introducing sacrifices or reduction in the other ones. This can be easily demonstrated by the following examples:

- The Espon regional database (I=High S=Medium T=Low) is characterised by a relative diversity of indicators, but these indicators are available at medium spatial level (NUTS2 or NUTS 3) and can generally not easily be transposed at a lower level of aggregation (NUTS 5) in order to produce for example good indexes on urban areas in relation to polycentrism. The most important weakness of this database is the time dimension, which is limited to the very short period 1996-2000 in most cases.
- The Corine Land Cover database (I=Low S=High T=Medium) is characterised by an opposite situation with a very high level of spatial resolution (100-200 m in vectorial format, 1 to 2 km in grid format), but with a very low amount of information (land cover) not always very well harmonised (cf. technical reports) and presently available only for one time period (1990). The time dimension will be of course strongly improved when the new version of CLC 2000 will be available, which is not the case at the moment.
- The World Development Indicator database of the United Nations (I=Medium S=Low T=High) is characterised by a high level of time resolution (yearly time series for most indexes) with a relatively important diversity of information. The most important weakness is the low level of spatial resolution which provides very few solutions for the description of regional differences and imbalances in Europe.

This multidimensional approach is a crucial challenge for the ESPON program because the development of good policy scenarios (and the revision of ESDP) suppose precisely a high level of quality in each of the three dimensions. Although the terms of reference mention that Project 3.2 should not spend much time with new data collection, it might be necessary to complement the information available, in particular in order to obtain longer time series, which is not the case in the present ESPON data base.

The selection of the factors and variables will also be influenced by the choices in terms of scenario approaches and hypotheses, to be defined by the project team in coordination with the ESPON MC and other external experts. There will be some feed-back between the assessment of available data and the choice of scenarios to be produced.

Territorial information available in the various ESPON Projects is listed in appendix A. In addition to regionalised information on demography and economy, the ESPON Projects have provided information on the structure and patterns of urbanisation, on accessibility and connectivity, on electronic connectivity, on the regional exposure to natural hazards and related risks, on the natural heritage, on R&D, on agriculture and rural development. This information might be complemented with information originating from Corine Landcover, from Eurostat, from the statistical annexes of the various cohesion reports (longer time series).

Territorial information is also available for the transnational areas of the Interreg IIC programmes. In particular projects with large-scale dimension have developed information systems which are of relevance here. As the scenario writing approach proposed hereafter will be a two-scale approach (at least for a number of scenarios), the availability of substantial territorial information at the level of the transnational Interreg IIC or IIIB programme areas is considered as particularly useful. An example is for instance the data base realised as background of the "Vision Planet" project in the CADSES programme. Other data bases, thematic studies or cartographic representations are available in other programme areas (Baltic Sea Area, South-West Europe, West-Mediterranean and Latin Alps etc.).

Deliverables

April 2004:

- Report containing
 - Evaluation of ESPON data situation, including main trends indicated by existing ESPON analyses
 - Evaluation of other transnational data sources
 - Project for the restructuring of the database in view of multidimensional data integration, longer time series and a sustainable future of the database (to be fed into task developed in section 6.2)

4.1.2 Assessment of available scenarios

In order to gain a general overview of existing efforts in terms of territorial scenarios in Europe (and elsewhere) we propose to collect, review and assess a number of already existing spatial development scenarios, from the point of view of their relevance, their experiences and lessons for the creation of scenarios in the framework of the project.

The number of scenarios prepared by different international and national government agencies, research institutes and individual authors is very large. We have to restrict our survey to scenarios, the central concern and topic of which is spatial and/or regional development within a fairly large area. Even within this circle, there are different types according to the dimension of the space and the scope of sectors and topics comprised. In respect to spatial dimension, there are: global scenarios (Global 2000, etc.), transnational spatial development scenarios for large European areas in the context of INTERREG IIC, and INTERREG IIIB activities, with Spatial Visions as a particular category of scenarios and national spatial/regional development scenarios.

The types of scenarios of special interest for us are scenarios of European and transnational dimension, but the collection and review will be extended to global and national (spatial) scenarios as well, including also a few scenarios on overseas countries like the USA and Japan. With respect to the scope of fields and issues concerned, we can distinguish between general and sectoral/topical scenarios. Obviously, the main interest will be devoted to general territorial scenarios, but nearly the same attention should be paid to scenarios in important specific fields or sectors (transport, environment, demography, migration, agriculture, etc.).

The scenarios will be collected from the existing literature and through contacts with experts (the ECP network might be of help here), but also through the Internet.

This assessment will give insight into contents, functions, objectives, spatial context, hypotheses, factors, assumptions and policy options lying at the core of the scenarios, but also into proper methodological and technical issues and how we shall deal with them in our project.

Deliverables:

April 2004:

- Report containing:
 - Annotated register of documents and websites containing information on spatial development scenarios, classified according to their relevance (to be integrated into the K&C tool described in section 5.2)
 - Conclusions to be drawn from existing scenarios in terms of future visions for European space

4.1.3 Assessment of scenario building techniques

The objectives of this module will consist of:

Initiating an informed reflection on the issue of scenario building and its relevance to European spatial development at different territorial levels. The aim is to launch the reflection on the issues of scenario building. This will focus on the relevance of scenario building to European spatial development at different territorial scales. This will involve developing a common understanding of futures studies and scenario planning scoping of existing methods their limitations, advantages and disadvantages in relation to the future spatial development of European Union at various spatial scales such as Functional Urban Areas (as defined in ESPON 1.1.1), Polycentric regions and the pan-European level. This work will be further developed when workshops targeted at the development and validation of scenarios at each level will be organised.

Providing a classification of scenarios for different outcomes and identify the data requirements for each type of scenario. The work package will produce a comprehensive review of the literature on futures planning and typologies including their comparative usability and knowledge needs. This will aid the classification of scenario methods – *proactive, prospective, traditional and interactive, quantitative and qualitative* – in an attempt to analyze underlying assumptions and assess the potential for a shared approach to scenario building based on ESDP goals and objectives. This will provide the necessary basis for the actual elaboration of scenarios developed in section 4.5.

A typology of existing ‘futures methods’ can be divided into two main approaches: (a) traditional reactive approaches, and (b) more pro-active approaches.

Reactive Approaches These begin with projection of present trends to the future that allows for forecasting the probability of various future events. The following table outlines examples of this approach.

Concept	Context	Technique	Applications
Extrapolation	Based on the assumption that once a pattern has been identified in the past it can be extended into the future to give a picture of what is likely to happen	Time series (quantitative) Non-linear trends e.g. S curve (non-quantitative) Cyclical patterns	Demographics population trends Micro Economics availability of certain household goods Macro Economics Expansion/recession cycles
Analytical	Based on the normative relationship between variables	Causal models	Transport Economics Construction of new roads and the distribution of traffic
Forecasting	Using judgement to assess the likelihood of alternatives	Delphi Cross-impact	See below Energy Studies relationships between solar energy development, carbon tax, etc.

Pro-active Approaches These begin with selecting a range of possible futures and tracing them back to their necessary policies or actions to bring that future about. These approaches have been summed up by Kay (1994) ‘*the best way to predict the future is to invent it*’. Several methodologies have been adopted for various disciplines, some more management oriented, e.g. *impact-assessment, cost-benefit analysis and risk-assessment*, others more creative, e.g. *imaging, brainstorming/writing and ‘incasting’*. Scenarios are often classed as a type of judgmental forecasting and they can be used as such. However they can also be used in a more positive way, either as a tool of management in a more creative form. Schwartz (1992) noted that scenarios were a way of ‘*ordering one’s perceptions about future environments in which one’s decisions might be played out*’.

Engaging in managed consultation on scenario methods and the elaboration of a scenario approach. In order to maximise consensus on scenario methods and the approaches to be used, consultation should be carried out. This is particularly important because the scenario methods listed above will also be analyzed in relation to the policy-making process and the various functions of scenarios. As Toffler (1970) describes, the search for preferable futures is inherently a political act: ‘*The management of change is the effort to convert certain possibles into the*

pursuit of agreed preferables. Determining the probable calls for the science of futurism. Delineating the possible calls for an art of futurism. Defining the preferable calls for a politics of futurism' (p407).

It is suggested to use the Delphi method. This is because the Delphi method seeks the input of collective experts to obtain a wide spectrum of views from individuals who may not normally communicate with each other, and upon this aims to produce consensus forecasts. It is ideally suited to provide a basis for evaluating alternative policies and visions of the future. Being conscious of the possible partial influence that could be exacted by the team which acts as moderator in this process, an attempt will be made to address the problem by ensuring a more 'bottom-up' and participatory approach by consulting the 'user community' which in the context of this project include the MC, the ECP and possible the 'Interreg networks'. Thus, we would suggest using a modified form of the Delphi method. Primarily this will involve a seminar/workshop session with the work package leaders, other TPG partners, the ESPON monitoring committee and other relevant stakeholders. This seminar/workshop session will focus on the typology of scenario methods and its usability in spatial development and futures planning. The outcome of this will be the movement towards a common understanding of scenario building and methodologies. By doing this, our cyclical scenario approach (see section 4.5.5) will be worked out. In addition, other more traditional reactive methods of exploring futures will also be outlined.

Deliverables

April 2004:

- Report containing:
 - Comprehensive review of the literature on futures planning and typologies including their comparative usability and knowledge needs
 - Recommendations on the choice of scenario methods for ESPON 3.2
- Delphi round on the relation between scenarios and policy-making process
- Seminar/workshop session with the work package leaders, other TPG partners, the ESPON monitoring committee and other relevant stakeholders focussing on the typology of scenario methods and its usability in spatial development and futures planning

4.2 Trend analyses, forecasts and projections

4.2.1 Consolidation of existing trend analyses through rigorous application of statistical (multivariate) methods

The various ESPON projects contain a series of analyses of past trends. These refer mainly to the following topics:

Demography ESPON projects 1.1.3. 1.1.4.	<ul style="list-style-type: none"> - Total population change at regional level - Natural population change at regional level - Change in dependency rate at regional level - Change in migratory balance at regional level - Components of population increase at regional level - Typology of depopulation areas - Regional concentration and deconcentration of population - Evolution of the population of FUAs and MEGAs
Economy ESPON project 1.1.3.	<ul style="list-style-type: none"> - Regional change in GDP per capita - Evolution of the wealth of FUAs and MEGAs - GDP performance differentials - Regional concentration and deconcentration of GDP
Transport ESPON Projects 1.1.1.; 1.2.1.	<ul style="list-style-type: none"> - Evolution of air connections between major European airports - Motorway network evolution
Processes related to urban areas ESPON Project 1.1.1.	<ul style="list-style-type: none"> - Typology of integration processes leading to polycentricity - Evolution of the European positioning of towns in relation to networking (air connections; students exchange) - Evolution of the population and economy of FUAs and MEGAs
Telecommunications ESPON Project 1.2.2.	<ul style="list-style-type: none"> - Evolution of digitalisation of the basic network
Natural hazards ESPON project 1.3.1.	<ul style="list-style-type: none"> - Large river flood events recurrence 1985-2002 and 1996-2002 - Change in precipitation in Europe - Change in runoff in Europe

Further trend analyses can be produced out of the ESPON data base. The available time period is however very limited (1996-2000), so that only short time series are possible to obtain. The use of other statistical sources could enable the production of longer time series, which are anyway necessary as a basis for long-term scenario writing. The probability that such information is available for EU-27 at an adequate level of desegregation is however low. Compromises will certainly have to be made, either in taking larger spatial units or in covering only a part of EU-27. For sure, for GDP, employment and productivity the initial reference year for assessing some “megatrends” in the case of EU15 can be shifted backward to the end of the 1970’s; experience and evidence from previous processes of integration and enlargement can be used for present forecasting purposes.

It should not be overlooked that trend analyses are also to be found in a number of Interreg IIC projects for the transnational areas concerned. An example is the Background Report realised for the projects VASAB 2010 Plus in the Baltic Sea Region. This Background Report contains a part on “Spatial trends and future challenges” related to the settlement system, the mobility network, nature areas, cultural landscapes, coastal areas and islands in the Baltic Sea Region.

Not only trends concerning the past, but also projections and forecasts are important elements for the preparation of scenarios. A number of ESPON projects contain such forecasts and projections (quantitative scenarios) or will provide some in the near future. This is the case in the following ESPON projects:

Demography ESPON Projects 1.1.3.; 1.1.4.	<ul style="list-style-type: none"> - Projections and scenario writing (available in early 2004) - Regionalised population scenarios (projections) for 2010 and 2025 - Exploration of shifts in long-term population growth
Accessibility in relation to regional wealth ESPON Project 2.1.1.	<ul style="list-style-type: none"> Evolution of regional accessibility and regional wealth under the following hypotheses: - Implementation of all most probable rail projects 2001-2021 - Implementation of most probable road projects 2001-2021 - Implementation of all most probable projects (road; rail) 2001-2021 - Reduction of the price of rail transport - Rise in the price of road transport - Full social marginal cost pricing of all modes - Implementation of all most probable projects and full social marginal cost pricing of all modes
Evolution of electronic connectivity and regional wealth ESPON Project 2.1.1.	<ul style="list-style-type: none"> Evolution of electronic connectivity and regional wealth (GDP) according to different ICT scenarios (different levels of investments in telecommunications): - Future change in accessibility and internet connection - Future change in related regional GDP
Agriculture and rural development ESPON Project 2.1.3.	<ul style="list-style-type: none"> - Absolute changes at regional level in CAP direct payments resulting from the MTR proposals - Estimated absolute changes in farm incomes at regional level resulting from the MTR proposals - Absolute changes in CO2 equivalent at regional level resulting from the MTR proposals - Percentage change in CAP payments at regional level resulting from MTR proposals - Percentage change in farm incomes at regional level resulting from MTR proposals.

The table shows that projections and forecasts are available in a limited number of fields related to territorial development. There is in addition heterogeneity in the parameters of these projections and forecasts (basic hypotheses, time horizon etc.).

However, the solutions currently used in the ESPON program for the integration of various dimensions appear as not rigorous enough. In most cases, the target indicators are not directly available at European scale and it is necessary to use “proxy” variables which are available and are supposed to be correlated with the target ones. When these proxy variables are defined, they are used for the elaboration of typologies, which are generally a transformation of quantitative attributes into qualitative ones by the choice of classes. Finally, these typologies are “crossed” together in order to elaborate so-called “synthetic indexes” or “synthetic typologies”.

Each of the steps described above should be controlled by strict statistical procedures, which is generally not the case. For example, the choice of a proxy should be validated by statistical tests of correlation-association, with tests on various samples through space and time. Another example of non relevant statistical practices is the elaboration of “typologies of typologies” which can be described from a statistical point of view as an increasing degradation of the initial information, introducing more and more possibilities of mistakes in data manipulation.

Accordingly, we intend to use more efficient statistical methods (correlation, regression, variance analysis, factorial analysis, classification with contiguity constraints,...) in order to respond to political requests of data integration. We are perfectly aware of the fact that the synthetic indexes elaborated by the ESPON program should remain as simple as possible in order to be presented and explained to end-users, and in order to remain maintainable and usable in

the future. But we also claim that the ESPON program would gain advantage of a more accurate use of multivariate analysis. One of the main targets of this task will be the elaboration of proposals for a European Territorial Cohesion Index (ETCI – see below) which could integrate the various dimensions (Social, Economic, Environmental) defined in the ESDP, the Lisbon document and the future constitution of Europe.

The methodology used for the elaboration of a European Territorial Cohesion Index will be both inductive and deductive:

1. The inductive approach will consist in various technics of multivariate statistical analysis (factorial analysis, cluster analysis) applied to variable included in the ESPON database in order to reveal how many independent factors can be statistically revealed and which type of territorial differentiations are related to those factors.
2. The deductive approach will consist in a normative approach trying to transform political concepts in operational measures through a process of research of statistical approximation of unknown variables (methods of correlation, multiple regression, discriminant analysis).

The problem is to obtain statistical estimators which are robust and can be computed at various periods of time and at various scales of analysis.

Relevant forecasts, projections and quantitative scenarios are also available in some of the Interreg IIC projects, however covering only one part of the European territory. As a two-scale approach will be applied in scenario writing (see below), forecast and projections for large transnational areas will also be useful. A good example of available forecasts, projections and quantitative scenarios can be mentioned: the project “Freight corridors and spatial planning in North-West Europe” (Interreg IIC Programme NWMA) produced forecasts for freight transport flows on several major corridors in North-West Europe for the years 2010 and 2020, showing progressing saturation and its impacts on flows dispersal and unsustainable territorial evolution. Forecasts are also to be found in other projects.

Deliverables

March 2005:

- Restructured database / data analysis tool based on existing ESPON trend analyses
- Trend analyses within larger time frame
- Integration of results from Interreg and other sources into the ESPON database

4.2.2 Complementary and global analyses

As shown above, the ESPON programme has produced a fair amount of analyses which give a good basis for the elaboration of scenarios. However, the information is not sufficient to gain a global view of future evolution of the European territory. It will, therefore, be necessary to complement the available projections and forecasts with additional work with more structural and homogeneous character. This will be in particular necessary for **the interpretation of trends in territorial competitiveness and cohesion (quantitative analysis and forecast):**

Several elements help understanding territorial differentiation:

- Institutional factors (accession, cooperation agreements)
- macroeconomic factors and strategies (fiscal, monetary and exchange rate policies)
- endowment of production factors (fixed capital, human capital, general infrastructure)
- territorial factors (structure of urban systems, geographical accessibility, environmental quality, etc.)
- socio-cultural factors (social/relational capital, social cohesion, trust, reputation, internal linkages and synergies: the “local milieu effect”).

The issues that will be tackled by the proposed models include (in addition to the elements already existing):

- trends in interregional disparities (taking in full account the historical evidence concerning the previous phases of international integration), both at the inter-national and intra-national level;
- trends in (macro-)sectoral shares and international/interregional division of labour among regions, trends in productivity increases, as a result both of innovation pace and intersectoral re-allocation of resources (especially from agriculture to industry and services, mainly concerning accession countries);
- trends in international (and possibly interregional) trade within and outside the E.U.;
- trends in flows of foreign direct investments (in cooperation with other expert groups);
- effects of monetary policies and convergence towards the euro;
- effects of enlargement and of co-operation agreements with Mediterranean countries;
- effects of the increase in accessibility (TENs) and of European co-operation (fiscal and structural policies) on regional evolution and disparities.

The methodology will be based on:

- descriptive statistical multivariate analyses;
- regression analyses for the interpretation of the driving forces of regional development, including territorial ones (accessibility, infrastructure, structure of the urban system, role of quality of life and environmental factors);
- simulation model for the quali-quantitative assessment of future trends. All the elements mentioned above will be taken into consideration in the construction of an econometric model (MASST, presented hereafter in section 4.4.1). Aspects that will be directly analysed are : GDP by macro-sector, productivity increase (competitiveness), foreign direct investments, labour demand, physical production.

Deliverables

March 2005:

- Data preparation for the quali-quantitative simulation models
- Multivariate analyses of the data
- First draft of report on quantitative trends

January 2006:

- Continuation of multivariate analyses depending on needs for scenarios
- Final report on quantitative trends

4.3 Qualitative analyses of driving forces

Driving forces having significant impacts on the territory can be classified into two groups: on the one hand forces originating from the society (fertility, life styles, societal needs etc), from the economy (locational behaviour of enterprises, globalisation of production and consumption processes etc.), from technological innovations (information society, and from the general environment, including climate change and natural hazards and on the other hand public policies with direct (infrastructure development, renaturation etc.) or indirect impact (through the modification of the behaviour of economic and societal actors) on the territory.

4.3.1 Analysis of economic, societal and environmental forces shaping the EU territory

The understanding of driving forces is of particular importance for scenario writing for the following reasons:

- the understanding of driving forces behind trends and developments is in particular of importance, as for a number of spatial trends it is not possible to establish time series at European level which allow estimations on future developments. Taking as an example the case of the Accession and Candidate Countries, development over the past 10, 15 years has been of extraordinary character. Thus it is impossible to use data on the evolution during these years for forecasting activities. Therefore a profound understanding of the existing driving forces and attempts taking into account possible new developments during the next decade(s) is an important step in the preparation of scenarios.
- the future cannot be predicted in using only a limited number of variables interconnected through a rigid model or simply extrapolated without taking account of changes in their environment. The consideration of evolution in the chains of causality is also necessary. This makes the introduction of qualitative analyses necessary. The quantitative analyses and projections presented in the preceding chapters, cannot cover all aspects of the development of the European space. In order to understand the different driving forces forming the territory of EU27+2, qualitative analyses, taking into account various factors which are difficult to approach quantitatively, are proposed.

The focus will be on the factors of change which might induce new dynamics and even trend reversals in the medium and long range. The discussion of driving forces will follow the three-level approach (micro - meso - macro) established by the common ESPON platform. The general assumption is that the same kind of exogenous trends and driving forces are important at all three levels, but that the effects and impacts as well as the actors dealing with it differ at the various levels. The overall issues to be taken into consideration are in particular :

- EU enlargement,
- EU and neighbouring areas,
- globalisation and macro-economic trends and technological development (incl. mobility structures),
- general driving forces in the field of demography and societal and social development,
- access to services of general interest
- locational preferences of population and firms
- changes in natural conditions.

The major driving forces will be identified by intensive literature reviews, but also out of the work of existing ESPON projects, some of which will present their final report in March or August 2004. ESPON studies on polycentric development (1.1.1), rural-urban partnership (1.1.2), the effects of enlargement (1.1.3), demographic effects (1.1.4) and those dealing with transport issues (1.2.1 & 2.1.1) and ICT issues (1.2.2) will be of major interest. In addition, the chapter "Driving forces" of the SWOT analyses, compiled in the Third Interim Report of ESPON Project 3.1. has to be used extensively. The relations between the different forces and trends will be explored, amongst others, by means of network analyses and in influence matrices.

The discussion of each driving force needs to address the spatial impacts of this driving force alone, as well as the interplay between different driving forces and their contradicting or amplifying impacts (systemic interferences). Issues such as territorial cohesion, polycentric development and accessibility will be discussed in particular.

By involving both thematic and national experts, e.g. through expert workshops or by applying the Delphi-method, spatial diversities regarding the importance of single driving forces and their spatial implication will be discussed. Given the impossibility to quantify all most important factors of spatial development, applying the Delphi-method allows achieving a better picture of the main driving forces and related trends as well as of their relative weight and impacts. An opportunity for doing so might be during a ESPON seminar in form of a series of workshops for (a) project leaders and (b) Monitoring Committee members. Another possibility would be to consider driving forces in a

specific geographical environment, in particular in the transnational areas of the Interreg IIC or IIIB programmes. On the one hand, some information can be found in various Interreg projects and, on the other hand, it is interesting to observe the difference in impacts which similar driving forces might have in different parts of the European territory.

In addition, the question of discontinuities of trends or existing structures will be addressed. This might be done in form of a wild card workshop. A wild card is a future development or event with a relatively low probability of occurrence but a likely high impact on the conduct of business. As a rule, neither the likelihood nor the impact potential will be known in advance; both will have to be assessed when identifying an event as a wild card. Discontinuities in trends or structures represent a prominent group of wild cards. In a wild card workshop a selected number of wild cards which are related to the scenarios in the project can be used for discussing their robustness.

On the basis of these various approaches, an overview of the major driving forces, their interplay and their spatial implications will be prepared as background for scenario writing.

Deliverables

April 2004:

- Report on current state of knowledge on driving forces

March 2005:

- Expert workshops (Delphi, wildcard)
- Assessment of the spatial implications of and interplay between driving forces
- Description of driving forces taking into consideration national (spatial) variations
- Description of potential “unexpected” developments and their implications

January 2006

- Continuation of analysis of driving forces in relation to the different draft scenarios
- Final report on driving forces

4.3.2 Territorial impacts of public policies and of their governance

A number of public policies, in particular at EU and national levels (which are in general strongly interdependent) have significant impacts on the territory. This issue has been investigated in a number of ESPON projects (2.1.1., 2.1.2., 2.1.3., 2.2.1, 2.2.2.) and also in other studies (“Spatial impacts of Community policies and cost of non-coordination”; 2001). In addition to the types of impacts likely to be generated on the territory, it has been shown that the way these policies are applied and the interaction between EU, national and sometimes regional authorities (which can be called their governance) have a determining influence on the territorial impacts. As policy scenarios are necessarily based on policies, it is important to be able to anticipate their potential territorial impacts. In this respect, it is also important to investigate if territorial impacts are homogeneous or not on the European territory (it can be assumed that the governance of policies and the geographical conditions of their application vary between the northern southern, eastern and western parts of Europe). Another possible relevant aspect is the role of centralisation/regionalisation on the territorial impacts. Hypotheses on changing territorial administration and organisation can be made in the scenarios.

The focus will be on the institutional inter-linkages between the governmental levels and the instrumental dimension of policies. Special attention will be paid to the impacts of the political context (enlargement of EU, further institutionalisation of EU etc.) on the policies and their territorial impacts. The policies and impacts will be analysed in an integrated way and related to the various regions in the EU and the neighbouring countries (e.g. least developed

regions and urban areas) and take into account cross-border, transnational and interregional co-operation. The results of this analysis will provide important building stones for the elaboration of the pro-active scenarios and policy recommendations.

With regard to the policies concerned, a distinction will be made between financial programmes (e.g. structure funds), regulations and norms (e.g. Habitat guideline), and spatial visions and orientations (e.g. TEN-T, ESDP). It will be important to not only concentrate on the policies, programmes and territorial impacts as such, but also on their synergetic effects and on the conflicts between them. An overview of direct (e.g. EU designation of habitat areas) as well as indirect territorial impacts (e.g. new administrative relationships because of EU-funding methods) will be provided.

In addition to the sources mentioned above, further existing and forthcoming scientific reports, policy documents, and scenario reports (OECD, research institutes etc). will be used. In order to gain more insight into the practice of the relevant policies, scientific and policy experts from the member states and the neighbouring countries will be interviewed. In this way qualitative and quantitative data will be combined. Data and information will be analysed by techniques like pattern coding, causal networks, and effects matrices. The results will not only be described in words but also visualised on maps.

Deliverables

April 2004:

- Report on current state of knowledge concerning policy impacts, based on the synthesis of the ESPON priority 2 projects and of the relevant literature

March 2005:

- First draft report on policy impacts, including synthesis of expert interviews
- Reflection on the issue of governance on all levels of European policy

January 2006:

- Continuation of analysis of policy impacts in relation to the different draft scenarios
- Final report on policy impacts

4.4 Set of integration tools

One of the most strategic tasks of the present project is to integrate a large amount of information originating from diverse sources in order to produce coherent, useful and interpretable outputs (scenarios, policy proposals). It is therefore important to use for this purpose integration tools. It does not seem however possible and realistic to develop a single model or system related to European territorial development in which all relevant variables and parameters can be included, comprising also the causality factors. Instead, several tools are proposed here which have a complementary function and which all aim at producing both coherence and reliable predictability. Some rely more on quantitative information (modelling, integrative indicators), while others rely more on qualitative systemic approaches. This strengthens their complementarity. The cyclical approach (as developed in section 4.5.5) will be very helpful to integrate the large amounts of information by first sketching the main lines of the scenarios and then working them out. Additionally, more specific tools needed to carry on a scenario-based analysis are needed. These include the following:

- Databases and GIS, to give a spatial structure to already existing data

- Sectoral forecast models (demographics, economy, transport, energy, environment...), to provide unexisting information, typically concerning the future. Quantitative forecast models are based on both theories and heuristics, or both (such as the classic “Four Steps Transport Model”) and involve statistical calibration. Often they require large volumes of data and very demanding computing times (hours or days). In Europe, a number of models for demographics, energy, transport, and environment exist, and partners in the team have contribute to develop some of them.
- Policy-evaluation models which are often based on calculating economic indicators, such as Cost Benefit (CBA), or more general Multicriteria (MCR), including together with CBA other qualitative criteria.
- Executive policy-simulation tools, or “scenario-building” tools, or “metamodels”, which are integrated, user-friendly tools that, often in standard commercial software, typically spreadsheets, allow the analysis of alternative policies; often, the user is guided in the selection of policies so they form a consistent policy-scenario, no too different from the ones previously analysed with the sectoral models. The tool then simulates the impact of the policies based in a kind of sensitivity analysis that adjust default values, produces the evaluation indicators and presents them in a synthetic easy-to-read format and finally somehow translated them into policy objectives.

The team will cover these different type of tools in the following way:

- For databases, ESPON 3.1 work will be mantained and updated (see section 6.2)
- For sectorial forecast models, existing models such as the economic model (MASST - see section 4.4.1), and the transport model (KTEN - see section 4.4.2) will be adjusted and applied (KTEN with the aim to include freight and logistics), and detailed analysis and gathering of results from demographic and energy and environmental models (e.g. TREMOVE from DGTREN) will be carried out.
- For policy-evaluation models, a number of policy-indicators to measure ESDP overall principles will be defined having as a final aim to define a European Territorial Cohesion Index as an aggregation of multiple criteria (see section 4.4.3).
- For the Executive policy-simulation, a new tool will be developed in standard spreadsheet format to be easily disseminated and used; previously to develop the tool a design will be proposed, based on existing tools (e.g. PACE-FORWARD, EXPEDITE or SENIT). For the sectors where no advanced forecast models as such exist in Europe, the simulation tool will include default light models helping the user at least to study the sensitivity of fundamental variables. Aggregated indexes or subindexes, quantitative and also qualitative, measuring ESDP principles. Needless to say, this tool will be developed just to support, validate assumptions and refine expert’s opinions, educated guesses and intuitions, not to substitute them. The Executive policy-simulation tool will also have a communicational and educational interest (see section 4.4.4).
- The ESPON knowledge and communication tool (see section 5.2) will also be an important instrument for the preparation of scenarios. It will create a link among the ESPON scientific community and will incorporate syntheses of strategic policy-impact studies, a selection of existing trend analyses and national and European scenarios to be identified, as well as user-friendly tools for data and indicator retrieval and graphic and desktop mapping visualisation, according to the need to explain and present scenarios in a friendly understandable manner. It will be closely related to the meta-models above.

4.4.1 MASST Model :

Macroeconomic, Sectoral, Social and Territorial model for the interpretation and subsequent simulation and forecast of territorial trends (at NUTS 2 and possibly NUTS 3 level for EU 27+2).

Utilising the regional data base built within the ESPON project (in particular on transportation, accessibility, agriculture, accession countries) an econometric model will be built and estimated for the interpretation and subsequent simulation and forecast of territorial trends (at NUTS 2 and possibly NUTS 3 level for EU 27+2). Independent variables will refer to the usual production factors endowment but also to new explanatory elements of the competitiveness / attractiveness of territories, namely human capital and social capital (the so called “local milieu” effect).

This will mean an overview of :

- theories of interregional convergence within a monetary union,
- theories of regional development,
- empirical evidence in previous phases of Community integration,
- results coming from national macroeconomic trend interpretation and econometric modelling, in particular developed for the DG Economic Affairs of the EU.

The present international scientific debate on the proper use and interpretation of indicators of inter-regional convergence and divergence will be taken in full account.

The use of the MASST model allows reaching quantitative results, on the basis of some conditional alternatives and their combination.

Deliverables

April 2004:

- Report on the methodology and state of necessary data for MASST model (as part of the report for section 4.1.1)

March 2005:

- Estimation of MASST model and interpretation of territorial trends
- Forecast of GDP, productivity and employment by macro-sector according to some basic scenarios

January 2006:

- Forecast of labour demand and production volume as input for analysis of labour mobility and commodity flows

4.4.2 The KTEN Transport Model

The KTEN model, now focused on transport, will be extended to cover freight and logistics, based on the results and methods of already existing freight models, such as STREAMS and SCENES, and others being developed also for DGTREN, such as DESTIN. KTEN has already being applied in ESPON. KTEN ("Know Trans-European Networks") is a passenger traffic forecast model developed to facilitate a strategic analysis of the trans-European Transport Networks in a wider pan-European and Mediterranean scale. KTEN is a sequential four-steps model, with combined modal split and assignment on multimodal networks. KTEN uses STREAMS results, WTO and EUROSTAT Air Traffic OD databases, as benchmark and/or references for validation of results. The development started in the Union's Territorial Strategies study made for DGTREN, then improved in the BRIDGES, SPOTLIGHTS and ASSEMBLING 4th and 5th European Research Framework; currently it is in use as a bases for the development of the passengers and freight DESTIN models, also for DGTREN.

Deliverables

April 2004:

- Report on methodology, notably concerning integration of freight transport, including assessment of data situation and needs (as part of the report for section 4.1.1)

March 2005:

- Estimation of KTEN model and interpretation of regional trends

January 2006:

- Forecast of freight transport and logistics demands

4.4.3 Towards a European Territorial Cohesion Index (ETCI)

Spatial scenarios have to be assessed on the background of common general objectives. Territorial cohesion being presently in the process of being included as an objective in the future European Constitution, it seems obvious that the most important scenarios to be elaborated be assessed against this objective. The difficulty for the moment is that there is neither a precise definition of territorial cohesion nor a quantitative tool to measure it. This is why an approach is proposed to attempt to use multivariate statistical analysis to develop a European Territorial Cohesion Index.

The elaboration of proposals for a European Territorial Cohesion Index (ETCI) is proposed, which could integrate the various dimensions (Social, Economic, Territorial, Environmental) defined in the ESDP, the Lisbon document and the future Constitution of Europe and could be used, among others, for the assessment of the various scenarios.

Deliverables**April 2004:**

- Report on the methodology for the measure of territorial cohesion, including assessment of data situation and needs (as part of the report for section 4.1.1)

March 2005:

- Application to European Regions in 2000

January 2006:

- Application to past and future trends

4.4.4 Executive Policy-Simulation Models (Meta-models)

The standard starting point for building up the metamodel is to gather trends from different sectoral models, as well as the scenarios on which they are based. For each sector (demographics, economics, freight and passengers transport, energy and environment) data and trends for a number of key indicators will be stored in separate spreadsheets, at the right aggregation level for each sector (European, national or regional). If more data or more desaggregation is useful, this will be handled in different files or even different applications, to keep the size of the metamodel light enough to provide answers in few seconds. Maps at NUTSII can be added to the spreadsheet using the simple cartography developed on ESPON 3.1 and Mapinfo components. The algorithms to calculate forecasts will be based both on statistical equations calibrated with sectoral model forecasts, and interdependent expert-rules based on “if”, and “then” conditions; all this taken together will constitute a small Expert System with possibilities of dynamic system modelling programmed in standard scripting language to be fully transparent to users.

The metamodel will be organised according to the following structure:

Scenarios: A number of predefined socioeconomic, technological and political scenarios will be provided for the user to choose (e.g., laissez-faire), but he or she will also be able to define a new scenario based on her expectations modifying the parameters and ratios defined for each sector. This “personalised scenario” will be constrained by a “check on consistency” to prevent both unrealistic scenarios and scenarios too distant from the boundaries of knowledge used to calibrate sectoral models

Policies: a number of policies directly linked to territorial aspects will be proposed as packages for the user to select one or to define a new one. Some policies could be relatively concrete (e.g. investments on high-speed railways, increase on Structural Funds allocations for Objective 1 regions, liberalisation of some agricultural markets) while others could be more general. Needless to say the capacity the user will have to define policy packages will be much more constrained than the scenarios definition.

Forecast: The territorial impact of the set of policies in a given scenario will be forecasted by statistical formulae calibrated with sectoral model results, and also by expert-rules. Statistical calibrations will try to interpolate between already existing results, and relate results across sectors; expert-rules will allow to include in the model expert criteria not captured by quantitative models only. Both methods will be linked in a dynamic system made of logical rules and quantities. A regular user will have very limited capacity to change the forecast engine, but it will be made as transparent as feasible to avoid the creation of a black-box.

Evaluation: Forecasted results will be presented to the user according to multiple evaluation criteria. She or he would be able to change the relative weights of each criteria (to the point of completely removing their influence) but not to add new ones. Based on these values, the metamodel will provide a synthetic overview, presenting evaluation criteria according to political goals (e.g. economic cohesion measured in terms of GDP/capita gaps, global sustainability in terms of CO2 emissions...).

Communication: simplified maps, graphics showing trends, tables ready-to-be-printed and other outputs useful for presentations will be included to make the tool friendly and useful.

Deliverables

March 2005:

- Integration of already existing proactive and prospective forecast models in standard spreadsheets (for examples see http://www.mcrit.com/MCRIT/MCRIT_MODELS.htm)
- First draft version of mapping components allowing presentation of model results
- First draft version of web site allowing interactive application of models (within the K&C tool developed in section 5.2 - also see <http://www.mcrit.com/simula/> for examples of web-based simulation models)

January 2006:

- Integration of new proactive and prospective forecast models in standard spreadsheets
- Final draft version of mapping components allowing presentation of model results
- Final draft version of web site allowing interactive application of models

October 2006:

- Final version of mapping components allowing presentation of model results
- Final version of web site allowing interactive application of models

4.5 Scenario building

4.5.1 The significance of scenarios in public policies related to spatial development

Experience has shown that no unique forecast can be relied upon. A particular approach towards projecting potential futures so as to channel knowledge and improve present and future decisions is thus required. Scenario building offers a methodology for understanding the whole range of possibilities and the ways leading to them. Scenario building is an instrument for making the uncertainty more understandable and easier to handle by

- providing insights into the most important trends determining the territorial development and into the most important strategies for policy-making,
- providing points of reference for the communication among policy-makers and stakeholders (scenarios embody different but comparable images of the future), and
- providing policy-makers and stakeholders ammunition to discuss and gain support for strategies they prefer.

In this way scenarios fulfil an insight, a communicative and a political function. This provides public authorities with the possibility to take action in order to make a desirable future more likely to occur.

Scenarios should therefore aim at detecting the key variables that emerge from the relationships between the many different factors describing a particular system, especially those relating to specific actors and their strategies. “Scenarios can effectively organise a variety of seemingly unrelated economic, technological, ..., political, and social information and translate it into a framework for judgement“ (Wack, 1985). In doing so, they provide a context for thinking more clearly about the otherwise impossible complex array of factors that affect any decision.

Scenario building is a particularly useful instrument in the field of territorial development policies because individual trends do not automatically come together to create full pictures of the future applicable to planning. A primary purpose of scenario building is therefore to create holistic, integrated images of how the future might evolve.

The scenario classification process developed in section 4.1.3 will provide the basis for the application of scenario techniques according to the guidelines proposed below.

4.5.2 The various types of scenarios

There are basically two families of scenarios:

Roll-forward Roll-forward scenarios are based on an analysis of present forces and their likely evolution. Several sets of plausible futures can be projected. A difference should be made between:

Baseline scenarios These are also called “laissez faire” scenarios, although this expression is ambiguous. It seems more appropriate to admit that baseline scenarios are those based on the hypothesis that no major changes occur in the strategies of private actors and in the policies of public actors. The presentation of baseline scenarios can be holistic or more specialised, emphasising some particular aspects of the general evolution in order to illustrate their impacts: for instance, baseline territorial scenarios on the long-term evolution of mobility, of climate change etc.

Prospective scenarios They are based on the hypothesis of significant changes in the behaviour of actors of society (population, businesses), in the natural environment, in available technologies etc. which are not caused by specific policies or by changes in these policies.

Prospective policy scenarios They are based on the hypothesis that changes take place in one or more fields (or levels) of public policies. Scenario building has here the aim to construct the images of the territory resulting from the implementation of these new policies. Various possibilities are here also possible, according to the degree of integration or sectoralisation in the policies applied.

Roll-backwards Several desirable or undesirable futures are selected and attempts are made to discover the paths that lead to them. In the terms of reference, they are called “pro-active scenarios” and are defined as scenarios with the point of departure in a future situation defined by political orientation (image as an objective) describing the necessary activities in relevant policy fields for achieving this objective. Pro-active scenarios may relate to integrated images (such as European polycentrism involving a wide array of urban and inter-urban functions) or to more topical or sectoral images (for instance sustainable transportation and mobility, balanced innovation potential among European regions etc.).

Several scenarios will be elaborated in the two families. Although a precise list cannot be given at this stage, broad indications are given as orientations. More precise information on possible scenario ideas will be provided in a subsequent section.

Among the “roll-forward” scenarios, it seems necessary to elaborate a rather integrative baseline scenario centred on relative stability of a set of relevant policies, enabling to assess the mid-range and long-range images against criteria of socio-economic and territorial cohesion. In addition, a limited number of more topical baseline scenarios will be elaborated to emphasise the territorial impacts of further development of threatening trends.

Among the prospective policy scenarios, it seems advisable to investigate the territorial outcome of various groupings of policies and various forms of governance of major policies, involving vertical and horizontal interactions.

The so-called “pro-active” scenarios are particularly well suited in the case where final (real or virtual) images of the European territory, or of parts of it, exist as orientations, guidelines and objectives, as it is the case for instance for spatial visions or for the polycentricity objective of the ESDP. Pro-active scenarios have to investigate in how far these final images are realistic and which policy efforts and resources they need for their realisation. They also make it possible to identify the favourable as well as the counteracting forces which facilitate or hinder their realisation. The final images to be scrutinised from the viewpoint of their realisation possibilities are not limited to the polycentricity principle or to the existing spatial visions elaborated for the transnational Interreg programme areas. Other images can be constructed, resulting for instance from the aggregation of national visions or scenarios or from alternative European or transnational visions. There is here a field for imagination and creativity.

In theory, the number of possible scenarios is unlimited. Their selection will be made according to their relevance for policies, in particular for EU policies, and to their degree of realism.

4.5.3 Concepts and approaches to be used in the elaboration of scenarios

Scenario building refers to a number of specific concepts and approaches such as:

Scenario base It is an organised and structured representation of reality as well as a system of dynamic elements connected to each other and to the external environment. The scenario base has to be constructed in accordance with the purpose of the scenario. It is the operational translation of the scenario hypotheses. The dynamic factors (“motors”) likely to put it on move have to be clearly identified.

Diachronic analysis It concentrates on the evolution in time of individual actors and elements and creates a differentiation between stable, slowly and rapidly moving factors, short-range and long-range trends. It identifies forces, constraints, imbalances and tensions as well as the need to introduce regulators.

Synchronic analysis Synchronic analysis enables the construction of images for future situations. It focuses on the study of a number of actors and their interdependence at a certain moment of time, while attempting to ensure coherence.

Context of a scenario It is related to the external environment (for instance to the relationships between Europe and the rest of the world). For each scenario, the context should be précised through one or more hypothesis.

Time horizon The terms of reference indicate two time horizons: the year 2015 for the mid-term (broadly 10 years after the completion of the scenarios) and 2030 for the long-term (broadly 25 years after the completion of the scenarios). This has several consequences. Long-range scenarios are particularly well suited to express trend evolutions (laissez-faire) and ambitious strategies: while it is totally unrealistic to expect a polycentric territorial pattern in Europe for the year 2015, some forms of polycentrism may have already crystallised by the year 2030 under certain conditions. On the other hand, the territorial effects of a given set of policies will appear more clearly and with higher relevance in the medium-term than in the long-term.

Quantitative and qualitative approaches Scenario building gains in using both quantitative and qualitative approaches. Qualitative approaches are useful to ensure a holistic appraisal of strategic factors, including those which are not quantifiable. Quantitative approaches are useful for ensuring the coherence of the scenario, to identify the dimension of processes and to depict incompatibilities. This last aspect is particularly important because incompatibilities may lead in some cases to the re-orientation of the scenario and in other cases to the search for solutions to arising oppositions or contradictions. The integration tools proposed above will ensure an adequate balance between quantitative and qualitative approaches (MASST model and meta-models in particular). As an example of complementarity between quantitative and qualitative approaches in the macroeconomic field, the best scenario approach that can be suggested is what can be called “conditional scenario building”. This implies: the definition of the main elements that will imply bifurcations in the evolutionary path of regions, with an indication of a range of probability of happening (e.g.: in the past, one of these elements was for sure the adoption or not of the common currency, forcing in precise directions the macroeconomic and monetary policies of member states). The simulation model will work on pure extrapolation or take into account the possibility of conditional events (political, diplomatic, economic, socio-cultural,...). These conditional events are part of the qualitative scenario building procedure, and refer to events that cannot be anticipated (yes/no).

Multi-scale approach As the European territory is rather heterogeneous, it seems advisable to split up a number of global European scenarios into a limited number of European sub-regions (such as the transnational Interreg IIIB programme areas) or of more homogeneous areas (center versus periphery, developed versus backward etc.) without losing global coherence. This will have a double advantage: the possibility to use information available at that level through a bottom-up approach (data bases, spatial visions, projections etc.) and the possibility to adapt the strategy and the outcome of the scenario to the specificities of the areas (territorial differentiation in scenario building). In addition to the two main scales (macro and meso), a number of scenarios will also provide insights into more regional and local aspects, such as urban systems, rural areas, coastal areas, border regions, islands, mountain areas etc.).

Scenario mapping and visual representations Mapping of territorial scenarios is a specific technique, the aim of which is generally to represent visually ideas and concepts, as well as dynamic elements and policy elements, while conventional cartography represents data and statistics. Two partners in the proposed team have specific skills in scenario mapping (MCRIT, BBR).

Scenario assessment Scenario assessment is an important step which makes it possible to draw conclusions on the level of correspondence between the final territorial image and the commonly agreed objectives (socio-economic and territorial cohesion, polycentricity) or on the appropriateness of policies to reach the desired image of the territory. In this way, the prospective scenarios can be compared in order to provide insight into the feasibility of the desired images of the territory, and the pro-active scenarios can be compared in order to gain insight into the contributions of different policy strategies to the desired images. A scenario matrix would allow viewing the relation between the two. The assessment of territorial scenarios generally requires rather integrative instruments and indicators. In this respect, the experimental European Territorial Cohesion Index, to be developed, could be of interest to classify scenarios according to their impact on territorial cohesion.

4.5.4 Possible scenario ideas

The precise definition of scenario hypotheses is not realistic at the present stage for at least two reasons: first it requires the completion of the preparatory steps described above (in particular the trend analyses and projections as well as the assessment of data and existing scenario approaches) and second, the scenario hypotheses should go through a process of consultation and validation.

It is however possible to provide at this stage some scenario ideas to illustrate the diversity of possible approaches:

In the context of baseline scenarios, several topical scenarios could emphasise the impacts of the further development in the long-term of already existing trends:

- the effect of the enlargement of the TEN-T (Commission proposal - 1.10.2003), especially in the enlargement area, as well as the increasing saturation of a number of transport corridors under the effect of growing freight transport and motorisation. This scenario should highlight the resulting process of traffic diffusion throughout

the territory (primary and secondary networks) as well as the relocation of activities in order to use new TEN-T corridors and avoid the use of saturated corridors. The impacts on related urban regions and their environment would also be shown;

- the increasing dualisation of rural landscapes caused by the increasing importance of market forces in the agricultural sector, in particular in fertile areas, combined with the decrease of EU support (in absolute terms) in less favoured areas due to the CAP reform;
- the expansion of the Central European Growth Area (Pentagon) along major axes. The scenario would provide an image of the new shape of this area in 25 years time with the related urban systems;
- the potential dualism inside EU27 between an industrialising east and a tertiarising west.

Among the prospective scenarios, the following seem interesting to study:

- territorial impacts of increased migration within the enlarged Europe and from outside Europe. The scenario would show the long-term evolution of regional imbalances in the field of demography-ageing, fertility, education etc.), economy (labour market, consumption), cultural evolution (multi-cultural society), urban systems, depopulation of certain areas etc.;
- territorial evolution caused by climate change and related natural hazards. While there is growing evidence for climate change, its territorial impacts are so far hardly identifiable. They are however likely to be significant: increasing drought and hot summers in southern and intermediate regions, changes in vegetation patterns, security problems in mountain regions (accumulation of water under glaciers), risk of flooding and large forest fires etc. A long-term scenario could show the structural cumulative impacts of climate change, including residential and business relocation, changes in tourism, in agriculture etc.;
- exploration of new technologies being likely to fully develop in the next two-three decades and have an impact on the EU territory (energy, transport, manufacturing, ICTs, etc).

As far as prospective policy scenarios are concerned, in addition to the medium-range image (in terms of socio-economic cohesion and territorial cohesion in the enlarged Europe), other scenarios seem meaningful, such as increased coordination of sectoral policies with significant territorial impacts, increased regionalisation in the implementation of these policies. A scenario of sustainable transportation would show, in addition to the environmental impacts, a new pattern emerging in the concentration/deconcentration of activities. In the same spirit, a territorial image resulting from the generalisation of high-speed railways in the European periphery could provide valuable insights into the evolution of regional attractiveness in Europe.

In the field of pro-active scenarios, various long-term images are already available, the realisation possibilities of which could be investigated (polycentricity, transnational territorial visions etc.). it could also be possible to investigate the paths leading to substantial territorial integration of the accession countries or to the emergence and consolidation of a new growth area in the central part of Eastern Europe.

4.5.5 Methodological approach to scenario building

In the aim of including the ESPON MC in the elaboration process, a cyclical and dynamic scenario-approach is proposed, combining prospective and pro-active scenarios, the traditional and the interactive approach, qualitative and quantitative analysis etc, all in line with the results of the preliminary analysis explained in section 4.1.3. By doing this we want to combine the best characteristics of the different scenario traditions and to enable the MC and other stakeholders to participate in an active way in the scenario project.

The scenario cycle consists of several building blocks. The basic analysis (described in section 4) provides an overview of the most important issues related to the spatial development on EU territory, the most relevant policies and programmes, and the most important societal trends, together with their driving forces. The future forward scenarios explore the possible courses of societal trends together with their driving forces and their territorial impacts. The future backward scenarios explore several (un)desired futures and the policies that may realize them, given the possible

courses of societal trends and their driving forces. The policy recommendations derived from these scenarios provide an overview of the most important policy-issues and policy options for the years to come.

By going through this cycle several times we want to develop, work-out and test the building blocks in a gradual way. This also makes the complicated project much easier to manage, since the cyclical approach enables the TPG, the MC and other stakeholders to build a common vision on the project results and to gradually work them out. In every cycle we shall make a movement from the present (basic analysis) via the long term (prospective and pro-active scenarios) to the short term (policy recommendations) and from the concrete (basic analysis) via the abstract (prospective and pro-active scenarios) to the concrete again (policy recommendations).

In the first cycle we shall define the building blocks and their main elements (issues, trends, policies, impacts) in a sketchy way by using the Delphi technique and the strategic workshop. In the second cycle we shall work the building blocks and their main elements out by writing essays and making designs. In the third cycle the most important variables and indicators will be derived from the essays and designs by using network diagrams, round table conferences etc. In the fourth cycle the data will be gathered and processed by making model calculations and using GIS. In theory one cycle follows the other, but in practice we e.g. may go through two cycles in a parallel way.

Deliverables

March 2005:

- Draft versions of roll-forward and roll-backward scenarios to be validated by rest of TPG and by MC and other stakeholders
- Workshops / validation rounds on these drafts (see section 5)

January 2006:

- Final draft versions of scenarios
- Final workshops / validation rounds on these drafts

October 2006:

- Final versions of scenarios

5 Consultation and communication

5.1 Consultation, validation, feedback, consensus-finding

The general objectives and context of this module are:

1. to ensure that consultation and validation mechanisms are activated and utilised

The aim is to ensure that project consultation and validation mechanisms are activated and utilised between the TPG partners and other relevant stakeholders, most notably the ESPON monitoring committee and ECP network. This consultation and validation process involves three key stages: (1) the organisation and collection of data and information *in process*; (2) the dissemination of information; (3) the organisation of feedback and further dissemination of data and information.

2. to utilise a range of mechanisms to ensure coordinated and continual consultation and validation

A key function of this work package is to support the requirements outlined in the terms of reference (TOR) to 'prepare and support a communication processdots (and) dotsbring added value through dialogue'. To fulfil this function, a range of mechanisms to ensure coordinated and continual consultation and validation will be utilised.

Among the stakeholders associated with the process of consultation, the ECP network plays a key role, as it is representative of national scientific communities. Its feedback is therefore highly significant in validating scenario development. A key objective is to disseminate this feedback in order to enrich scenarios by reflecting the different national planning cultures and sensitivities within the ECP network. In particular, a series of strategic workshops with the ESPON monitoring committee and ECP network will be undertaken in order to facilitate on-going dialogue over the knowledge produced by, and between, those involved in the project. The *Delphi* method of consultation among expert groups will be employed in a modified fashion (i.e. a less 'top-down' and more consultative). The *Open Method of Co-ordination* may also be used for inter-facing policy and implementation in order to identify areas of difference and disagreement in the search for policy coherence.

The validation and monitoring on ideas and recommendations on the role of scenario building in Europe will be addressed through a series of 'round table' meetings targeted at the MC and ECP. This will allow for the preparation of scenarios in a 'cyclical and dynamic waydotsgradually developed and tested' (TOR). The work will focus on the relevance of scenarios to different regions of the European Union in order to elaborate a distinctive and contrasting scenario base for a sustainable and enlarged EU with considerable variation in spatial development. This will be achieved through additional 'round table' sessions to validate scenario building within specific regions of Europe, transnational spatial development scenarios (through INTERREG IIC, IIIB), and/or spatial visioning exercises for national and regional development.

3. to facilitate dialogue and consultation through virtual and paper-based media

The work will also manage inputs to a discussion forum linked to the project web-site to ensure continuous dialogue and reflection on the consultation and validation mechanisms outlined in section two above, and on the project overall.

Deliverables

April 2004:

- First draft recommendations on communication strategy throughout the project

March 2005:

- Report on communication strategy to explain scenarios, trends and policy impacts and facilitate discussions, including further consultation methods and strategy
- Seminar presentation / workshop on results of tasks developed in sections 4.1.2 and 4.1.3

January 2006:

- Workshops on general validation of scenarios
- Round table meetings on regional validity of scenarios
- Web-site discussion forum / mailing list for continuous dialogue
- Progress report on communication strategy

5.2 ESPON knowledge and communication tool

The development of this knowledge+communication tool (K+C) responds to the specific objective stipulated in the ESPON 3.2 terms of reference “to continue the scientific guidance within the ESPON programme and the further development of innovative ESPON tools”. The K+C tool will be service-oriented, aiming not to use advance technology for the sake of using it, but to make a useful contribution to the rest of the ESPON 3.2 project and the whole ESPON Community, only when needed.

Building on the results of ESPON 3.1 policy-approach, the K+C tool will be Internet-based, open to the whole ESPON Community, and will incorporate as starting point updates of WP3, WP4 and WP5 outcomes, syntheses of strategic policy-impact studies, a selection of existing trends and national and European scenarios to be identified, as well as user-friendly tools for data and indicator retrieval and graphic and desktop mapping visualisation, according to the need to explain and present scenarios in a friendly understandable manner. See http://www.mcrit.com/espon_scenarios/ for a prototype of this web site.

The starting point will be the work carried out by project 3.1 in some technical and scientific aspects, including data collection, spatial tools, further development of an ESPON map-making facilities, as well as preparing for the cross thematic exploitation of integrated results based on all ESPON projects. Following the approach used on the SPESP web knowledge-base, aiming to consolidate and disseminate results from projects, preliminary results and findings of ESPON 3.2 will be gradually incorporated into the knowledge-base, from the scientific work being carried out in parallel by the WPs. Much of the work of the different WPs is inter-linked or complementary, so that the K+C tool will operate as a mechanism pushing for the continued interaction and scientific coherence of the TPG. Moreover, from the analysis of all documents, articles, papers, books, studies, quantitative and qualitative trends for all sectors and different regions, countries and macroregions, included in the knowledge-base, preliminary trends for all sectors will be derived in quantitative terms, according to the underlying hypothesis and scenarios of each one. This will constitute a reference for scenario building and forecast models to be developed in other WPs.

First versions of the K+C tool will exist early on in the project development, focusing mostly on the knowledge-base component. In March 2005, for the Second Interim Report, a communication strategy will be proposed, ensuring a relevant informal debate of prospective / trend scenarios and orientations through Internet. Ultimately, the ESPON virtual knowledge base constitutes an innovative tool; and it will no doubt reinforce the scientific integrity and consistency of the 3.2 co-ordinating and territorial cross-thematic project, and therefore inevitably, also that of the ESPON initiative as a whole.

Deliverables

April 2004:

- First draft version of web site for information and knowledge centralisation
- Extranet goupware tool for internal TPG documents and exchanges

March 2005:

- Final draft version of web site
- Continous update of the knowledge base web site, including synthesis of existing studies
- First version of Java-based mapping simulator of Europe
- Input into communication strategy to explain scenarios, trends and policy impacts and facilitate discussions (part of report for section 5.1)

January 2006:

- Final version of web site
- Continuous update of the knowledge base web site, including synthesis of existing studies
- Input into progress report on communication strategy (part of report for section 5.1)

October 2006:

- Recommendations on further use of knowledge base (as part of report for section 7.2)

6 Coordination of the ESPON research effort and platform

The ESPON programme is a diverse collection of research projects that are sometimes difficult to reconcile into a clear message. It is thus of fundamental importance to coordinate this effort, especially in view of the elaboration of transversal, spatial scenarios. The end of the current ESPON programme in 2006 also highlights the need to create a sustainable knowledge and tool base that can serve for future research efforts. In that perspective, the terms of reference specifically foresee the coordination of the ESPON Database and GIS.

6.1 Networking and scientific coordination of the entire ESPON platform

General scientific coordination of ESPON is currently covered by project 3.1. With the end of the latter in December 2004, the task will be transmitted to project 3.2. The aim will be to render this transition as smooth as possible, which is highly facilitated by the presence of the 3.1 project leader in the TPG, and to ensure that at the end of 2006 the ESPON scientific platform offers a useful and efficient tool.

The main challenge will be to ensure a coherence allowing the results of all ESPON projects to converge towards a global understanding of European territorial development. This convergence should not, however, impede the diversity of approaches.

As most ESPON projects are already in their final phase, it will not be possible anymore to influence any main directional decisions, but it will still be possible to improve the presentation and exploitation of results (in particular the interpretation of numerous maps produced as to their policy messages). Recommendations to the various TPG along these lines will be formulated. It will also be important to define a common framework in which the results of each TPG can be integrated. This implies the definition of basic questions concerning European spatial development. These questions will be part of the scenarios developed in project 3.2, and the latter will, thus, have the role of coordinating TPG results in a matter useful for project 3.2 itself, but *à fortiori*, also for the entire ESPON process and its future.

An important part of this coordination will also be the interfacing of the research teams with the political level, ensuring that the practical needs of the latter are reflected in the results of the former.

Deliverables**April 2004:**

- Report on situation concerning scientific guidance and strategy for transition from ESPON 3.1

March 2005:

- Report on progress in scientific guidance and on ESPON methodologies, indicators, typologies, etc (ESPON platform) and on progress towards harmonised and sustainable spatial research tools

January 2006:

- Report on progress in scientific guidance and on ESPON methodologies, indicators, typologies, etc (ESPO platform) and on progress towards harmonised and sustainable spatial research tools

6.2 Management and enhancement of ESPON Database and ESPON GIS

6.2.1 Follow up of work undertaken under ESPON 3.1

The management and improvement of the ESPON database and, in this context, of ESPON GIS must cover two aspects in the future work. It must guarantee a continuous provision of regional and spatial information during the ESPON process, especially thinking about the successive endings of the different projects. Furthermore a concept is necessary to ensure a potential continuation after a possible end of the ESPON programme.

A second aspect focuses on the special demands to the database for the elaboration of the scenarios envisaged including a balance of qualitative and quantitative elements. Here the needs to maintain and further develop the existing ESPON Database and ESPON GIS in the context of a longer time range and broader spatial coverage are obvious. For the future, the maintenance and updating of the ESPON Database co-ordinated and elaborated by the TPG ESPON 3.1 will be a valuable input. The structure proposed in the 3.1 3rd interim report and the possibility for GIS database connections meet the demands for spatial analysis. Successful coupling with 3.1-analysis tools like ESPON Hyperatlas or Web-GIS will enhance the sufficient use of these instruments.

The challenge to make proper use of all ESPON results and tools, data and maps provided so far in the development of scenarios and orientations, coincides with the main aim of GIS to include, beside map-making (in fact only the basic use), also tools for spatial analysis by combining and relating territorial data, socio-economic indicators and typologies. By doing this, a definition of integrated territories in a European and transnational dimension with common dynamic opportunities relevant for specific policy support and intervention will be enabled.

6.2.2 Improvements to be carried out under ESPON 3.2.

Currently, the ESPON program is mainly engaged in the development of a regional database which is supposed to include the maximum number of indicators, but without considering sufficiently the necessary development of the other dimensions (space and time). Therefore, the risk exists that such an ESPON database which was quickly established for a specific task cannot be maintained in the future because it has not been built in a sufficiently wide perspective. The TPG ESPON 3.2 which has the responsibility to conclude the actual stage of the ESPON Program 2002-2006 should evaluate very precisely what has already been achieved and propose new directions and recommendations for the future. These proposals will be defined at an early stage, and then applied and tested on the databases used for the realisation of policy scenarios. In the meantime, a number of improvements will be carried out in the context of ESPON 3.2.

Multiscalar Spatial Analysis & the Modifiable Area Unit Problem The TPG ESPON 3.1 has developed a first set of spatial analysis and cartographic tools, adapted to the analysis of regional inequalities in Europe and based on a very specific database : the NUTS2/NUTS3 regions in their current delimitation. The tool which has been proposed in the package "Multiscalar Spatial Analysis" on an experimental dataset (GDP/inh. in 1999) should be more efficiently coupled with the ESPON database and maintained by ESPON 3.2 when the TPG 3.1 will be achieved. But it is also important for ESPON to develop new work packages which can provide answers to actually unsolved questions. The most important challenge actually is the integration of heterogeneous databases established on non-compatible territorial divisions. This "Modifiable Area Unit Problem" (MAUP) is certainly difficult to address for the ESPON program, but it is the key for two decisive ESPON challenges:

- thematic integration of datasets (e.g. environmental and socio-economic)
- time integration of datasets (e.g. maps of evolution and prognosis between 1960 and 2050)

On this particularly difficult topic, many solutions have been proposed by researchers in GIS, Geomatics, and spatial statistics, generally based on a combination of aggregation and disaggregation methods. The working group “Hypercarte” could play an important role for the collection and diffusion of information on this theme. It proposes to insure a double link between (1) ESPON and the European statistical institutes networks (INSPIRE project) and (2) ESPON and the European Research Community in the field of Spatial Analysis (6th Framework Programme). More precisely, “Hypercarte” proposes to develop a set of multiscalar smoothing methods which could be applied on social and environmental European databases and produce continuous harmonised maps at various scales and for different time periods. The package “Multiscalar Spatial Analysis” which is currently developed under GPL licence has already been applied to the world distribution of population, wealth and CO₂ and the related maps have received the 1st Price of Cartography at the Festival International de Géographie de Saint-Dié-des-Vosges in 2000. The Gaussian smoothing method developed by the Hypercarte Group has been applied by national and international statistical offices like INSEE, EUROSTAT, EEA, etc. Preliminary experiments of this methodology has been realised by the TPG ESPON 3.1 with successful results on the smoothing of GDP/inh.at NUTS2/NUTS3 levels .

Adapting the database to the needs of long-term scenarios The ESPON database in its originally intended design is not sufficient for the development of scenarios because of the narrow time focus and owing to the defined coverage of EU27+2 and a now broader focus including all the neighbouring countries (also the Balkan area, the Eastern and South Mediterranean countries, and the eastern part of the Barents Region) also in spatial focus. A central focus is, thus, the expansion of the database within time and space. The time range has to be extended into the past to ensure longer time trend estimates for fundamental indicators. Potential further needs of data especially related to Eurostat should be bilaterally discussed according to the ESPON and Eurostat agreements. A project-related contact should be responsible for guiding and bundling the ESPON demands. In combination with global databases of multi-national institutions like e.g. OECD and the United Nations, the AMECO database including data from main economic competitors and global economic regions will serve as a starting point to investigate the world situation necessary for a scenario development. The aim will be to study Europe in an open system and the construction of an according database.

Being aware of the problems of data harmonisation and regional coverage and considering the macro-regional and more spatial scope of the envisaged scenarios, the use of NUTS 3 strictly demanded by ESPON should not prevent a potential territorial and socio-economic analysis. A broader use of the more functional, and in the EU sense, so-called standard regions for socio-economic question NUTS 2 - could be an appropriate level for those cases where data do not cover NUTS 3.

The integration of societal and social aspects to cover subjective regional attitudes of the population concerning the enlargement, European integration as well as other topics like living conditions will be important. A suitable database for the statistical investigations in this field is the European Community Household Panel with suitable information generally possible for NUTS 1 and NUTS 2. Furthermore, the Eurobarometer (Standard Eurobarometer for EU Member States and Candidate Countries Eurobarometer) will be a suitable base for a sound analysis.

Improving indicators The ESPON program has the difficult task to integrate a wide set of heterogeneous indicators related to the main objectives of ESDP: Social Cohesion, Economic Competitiveness and Sustainable Development. In that context, the common framework of indicators agreed upon in the existing core indicator list will be further developed and enriched according to the needs related with the scenarios. The elaboration of a European Territorial Cohesion Index mentioned above also is part of this process, both as a means and as a goal in the sense that the elaboration of this index demands a sound basis in terms of usable indicators and that, at the end, it will itself serve as an indicator for the assessment of scenarios.

The main aim has to be a certain homogenisation in order to be able to use the proposed indicators in a sustainable manner. This also includes a continuous maintenance and update in the responsibility of project 3.2 related to the basic indicators provided so far by project 3.1. As these data are in general based on the Eurostat Regio database, the updating will be done according to the agreements for new data deliveries with Eurostat. Updating of relevant data of other ESPON projects will be restricted to the indicators of the core indicator list. Any meta-information needed has to be provided by the appropriate TPG and 3.1.

Deliverables

April 2004:

- Report on state of ESPON database and GIS (as part of report for section 4.1.1)
- Report on state of the art on the Modifiable Area Unit Problem, including preliminary proposals on integration of heterogenous databases

March 2005:

- Progress report on the restructuring of the database in view of multidimensional data integration, longer time series and a sustainable future of the database (follow-up of report for section 4.1.1).
- Report on possible integration between the ESPON database, the Executive Policy-Simulation Models (section 4.4.4) and the K&C tool section 5.2) in view of the future of the ESPON tools
- Continous update of the ESPON database

January 2006:

- Final draft report on the state of the ESPON Database and GIS (as part of report for section 6.1)

7 Policy recommendations

The main objective of project 3.2 is the elaboration of policy recommendations. These concern both issues covered in the project, i.e. the spatial scenarios and related policy issues and the future of a European spatial science research network based on the developed tools.

7.1 Elaboration of policy recommendations for future EU and national spatial development policies

As a result of the work on quantitative and qualitative data, ESPON project 3.2 will elaborate guidelines that European and national spatial development and related policies should follow depending on given (political) choices of objectives. The policy recommendations to be developed will have to be applicable to EU measures, but also to national policies. They will put special emphasis on specific EU programmes as regards their potential spatial impacts and on the issue of coherence between different programmes and policies and on the possibilities of stronger synergies.

The recommendations will cover both spatial aspects of transversal policies and sectoral aspects. Special focus will be made on issues with a profound direct spatial impact such as transport, economic development, environmental issues, etc.

The consultation procedures presented in section 3 will ensure that the recommendations are actual and politically applicable, although room will also be left for scientific creativity in the definition of possible futures. This also implies efficient means of communicating the results of the research in a way to make the complexity of spatial tendencies easily understandable.

Deliverables

March 2005:

- First draft policy recommendations

January 2006:

- Final draft policy recommendations

October 2006:

- Final recommendations on future EU spatial policy orientations, including reflections on issues of governance at all scales

7.2 Elaboration of recommendations on the future of the ESPON platform (including ESPON Database and GIS) and a European research network on spatial planning

ESPON is a special research effort limited in time and objectives. In order to provide the EU with a more permanent and sustainable tool for spatial research and planning, the TPG will offer recommendations on how to organize a future European network on spatial planning, as well as how to manage and enhance continually the ESPON Database and GIS.

These recommendations will be based on the practical experiences of the ESPON programme, as well as on theoretical reflections developed in section 4. The input from the ESPON CU and the ESPON ECP network will be of special interest in that context.

Deliverables

October 2006:

- Final synthetic report on scientific platform for ESPON 2006, including indicators, methodologies, tools, concepts, typologies and data, etc., including recommendations for their sustainable management
- Final recommendations for further improvements in a continuation of a European spatial research network