Proposal

The envisaged Action 2.1.2 of the ESPON 2006 Programme under INTERREG III Art 53 entitled 'Territorial Impact of the EU Research and Development Policy'

24th May 2002

by
ECOTEC Research & Consulting Limited
13B Avenue de Tervuren
B-1040 Brussels
BELGIUM
Tel: +32 (02) 743 89 49
Fax: +32 (02) 732 71 11

TABLE OF CONTENTS

6.0 INFORMATION FOR THE PURPOSES OF AWARD CRITERIA C: THE WORK PROGRAMME

6.1 The work programme

The work programme below outlines a series of 11 work packages which will combine to form the two year research project.

A. MANAGEMENT AND COORDINATION

Work package 1: Management and coordination

B. BACKGROUND AND CONTEXT

Work Package 2: Literature Review & Analysis

Work Package 3: Collection of indicators

Work Package 4: Developing description of R&D policy

B. DEVELOPING THE CONCEPTUAL MODEL

Work Package 5: Development of Conceptual Model for Territorial Impact Assessment of R&D in Europe

Work package 6: Indicator development

Work package 7: Database development

C. IMPLEMENTING THE MODEL

Work package 8: Data collection

Work package 9: Carrying out a mapping exercise to analyse territorial trends, potentials and problems deriving from R&D policy, at different scales, and in different parts of an enlarged European territory

Work package 10: Case Studies

D: POLICY RECOMMENDATIONS

Work package 11: Deducing recommendations for future policy development in support of territorial cohesion and the ESDP

The work packages will in many cases run parallel with each other so there will be integration and feedback between the different aspects of the research process. For example Work Packages 4 and 6 will be closely interlinked. The work packages involved in Section B (background and context for the research project) will be completed by Month 6 to provide the basis for the other work packages, and the resulting tools and background material will be drawn together and presented in the

second working group meeting in Month 5. In addition, the timing of the work packages will comply with the targets set out in relation to the four interim reports (set out within Work Package 1 below) and the aims set out in the ESPON 2006 programme, which include

Until 2003:
a) to develop appropriate tools for the processing of the new data base, indicators and map-making;
b) to develop applicable systems for the monitoring of new trends of territorial developments;
c) to detect typologies of regions revealing risks and potentials for the identified types of regions;

Until 2006:
d) to show the new territorial developments in the broader context;
e) to show access points for policy responses on the new territorial developments.

6.2 Detailed information on each work package

A. COORDINATION AND MANAGEMENT

Work package 1: Coordination and management

Timescale: Months 1 - 24

Aim: The aim of this work package will be to ensure the smooth and effective running of the project, to coordinate working group meetings, and networks with other ESPON research projects and institutions in candidate countries and to run a seminar to discuss findings at an interim stage.

A summary of the coordination and management technique for the Transnational Project Group is included in Section 1 of this proposal However more details on the different stages of the process are set out below.

We would request that the ECP and lead partner attend an initial meeting with the ESPON Coordination Unit as part of the inception phase to clarify expectations, confirm the methodological approach and refine the study work programme in a way which best meets the needs of the ESPON Coordination Unit.

This work package will include the organisation of **working group meetings** including both academics and practitioners. These meetings will occur every six months prior to reporting dates with the ESPON Coordination Unit. The first of these working group meetings will be held at inception stage and will enable the Transnational Project Group to:

- clarify aims and objectives
- agree shared definitions and terminology
- confirm allocation of roles and responsibilities and agree to deadlines and timescales:

Coordination with other ESPON research projects and institutions in candidate countries will be key to the success of the research, and ECOTEC will achieve this through developing **email and web-based networks** with key experts at an early stage in the research project.

As lead partner, ECOTEC will ensure that the partners with main responsibility for taking forward each work package will be kept up to date with progress on other ESPON research projects. This will be facilitated by the development of a **email or web based network** with a series of key experts working on relevant ESPON projects. An additional network will also be set up with interested **institutions in the candidate countries** to facilitate dissemination of research findings to these institutions.

The project will include a **seminar** to discuss, disseminate and develop concepts and findings at Month 15 of the project. The particular focus of the seminar will be on border issues, and the territorial impact of research and development policy within an enlarging Europe. Invitees will include institutions from candidate countries, a wide number of policy makers, practitioners and academics from the field, and participants from other ESPON research projects. The seminar will be held with enough time for discussion with experts to feed into the final conceptual model.

As part of ongoing dissemination, the Transnational Project Group will also develop a **website** which will be used by all partners as a point of exchange of knowledge, a place to site documents, and a point for dissemination of information and useful links.

1. Management and reporting

Key Tasks	**Key Partners Involved**	**No of days**
1. Inception phase – including:		
a. Initial meeting with ESPON Coordination Unit	ECOTEC Research & Consulting Ltd	1
	TAURUS	1
2. Coordination of four (six monthly) working groups involving all both academics and practioners		
a. Preparation for meetings	ECOTEC Research & Consulting Ltd	8
b. Partners attending meetings (including preparation and travel)	All partners (based on one member of staff per partner) (6x2x4)	48
	ECOTEC 4x2	8
3. Coordination of reports sent to ESPON Coordination Unit including		
· **Interim report 1** September 2002: To include: consensus on necessary indicators and first outline of methodology of impact analysis	ECOTEC	6
· **Interim report 2** Mnth 12: To include: development of database, indicators (including requests for new indicators) and mapping. To present methods for the TIA, and to define indicators, typologies, instruments necessary for TIA, and to present f	ECOTEC	6

· **Interim report 3** Mnth 18 To include: tentative results of research undertaken including assessment of territorial imbalances in relation to R&D and spatial effects of R&D	ECOTEC	6
· **Final report Mnth 24** To include: comprehensive presentation of territorial impacts relating to the enlarged European Union, conclusions as to thematic policy adjustments necessary, definitions of institutional settings which could support bette	ECOTEC	20
	All partners	20
4.Design and development of website for project	ECOTEC	7
5. Markteting of website to and development of email network with, institutions from candidate countries who will be interested in the research results via website	ECOTEC/TAURUS	2
6. Marketing of website to and development of email network with. experts from other ESPON research projects who will be interested in the research results (particularly Priority 3, other actions in Measure 2.1 and actions 1.1 and 1.2) via website	ECOTEC/TAURUS	2
7. Organisation of a one-day seminar for 25-30 people as part of the project to disseminate and discuss findings, including involving partners from candidate and neighbouring countries, and researchers involved in other projects within the ESPON programm		
a. Preparation for seminar	ECOTEC	10
b. Attending seminars	All partners	6
	ECOTEC	2
8. Management of partnership including chasing reports, managing financial procedures etc	ECOTEC	20
Coordination with other projects and with the Coordination Unit	TAURUS	10
TOTAL DAYS		**183**

B. BACKGROUND AND CONTEXT

Work Package 2: Literature review and analysis

Timescale: Months 1 - 3

Aim: The literature review will draw out conceptual frameworks, identify and draw upon previous research findings and agree common definitions as a basis for all other work packages.

This work package will include the identification of existing assessment methods and models in relation to territorial impact assessment and evaluation of R&D as access points for further research. The aim will be to draw out the useful elements of these models, whilst taking note of their potential synergies. Sources of methods and models will include:

- Territorial Impact Assessment methodology developed through the SPESP
- Evaluations of RIS and RITTS

In addition, the existing access points listed in the Terms of Reference will be an important basis on which to build our analysis of current policy in relation to R&D.

2. Literature review

Key Tasks	Key Partners Involved	No of days
1. Prepare framework for the literature review	University of Cardiff	1
2. Analyse available literature on state of R&D, trends and impacts at a European level	University of Cardiff	8
3. Compilation of national and regional level studies with European relevance	University of Cardiff	3
4. Specialist input of all partners according to geographical representation and language specialism	All partners	18
5. Summary of R&D policy and trends to feed into Work Package 4	University of Cardiff	4
TOTAL DAYS		**34**

Work Package 3: Developing description of R&D policy with reference to the territorial aspects and the government level responsible

Timescale: Months 1 - 4

Aim: The description of R&D Policy at a European and Member State level will look at at the current situation of R&D in Europe and set out future trends, taking into consideration institutional and geographical arrangements, and relevant policy and policy actors at a local, regional and national level. There will be a focus on the relations between public investment and the spatial distribution of private R&D funding.

A structure of the description of R&D policy will be available for the first Interim report in September 2002.

At both a theoretical and practical level, the work package will need to look at the dynamic interrelations between a number of different factors which fall into the field of R&D policy:

- Generic research and scientific excellence
- Applied research
- Innovation
- Technological development
- Knowledge based industries

There will be a focus on resources that are available at a EU level to conduct R& D policy, how these resources are distributed, and how EU R&D policy is coordinated with national policy frameworks. Due attention will be paid to:

- The new European Research Area and the development of research capacity and networks of Excellence and large projects across Europe
- National Policy Frameworks
- The Structural Funds, and the linkages between the ERA and the Structural Funds
- Research funded by the Environmental Framework programme

This work package will also indicate relevant institutions and actors involved at different policy levels within R&D which will be elaborated on within Work Package 10 Case Studies. These findings will feed into Work Package 11 on policy recommendations for the better territorial coordination of R&D policy.

3. Description of RTD policy

Key Tasks	**Key Partners Involved**	**No of days**
1. Structure of description of R&D policy developed for first Interim report	ECOTEC	3
2. Development of description of R&D policy through		
a. a period of desk research	ECOTEC	10
b. writing description	ECOTEC	2
TOTAL DAYS		**15**

Work Package 4: Compilation of available indicators

Timescale: Months 1-4

Aim: This work package will involve the compilation of current indicators available at a European, national and regional level to display the state, trends and impacts of R&D policy in Europe.

The achievement of consensus on indicators and the necessary data will be a first priority for the research project and will be available as part of the first Interim report in September 2002.
The choice of indicators will also define the appropriate geographical level and technology required for data collection and will therefore feed into Work packages 7 and 8.

Initial lists of data, and requests for statistical data will be based on information gathered from EUROSTAT, EEA, National Statistical Institutes and National Mapping Agencies.

Sources of indicators will include (non-exhaustive):

- EUROSTAT
- European Innovation Scoreboard 2000
- Towards an ERA science technology innovation key figures 2000

- REIST-2 The Second European Report on Science and Technology Indicators 1997
- Nationally available statistics as appropriate

Indicators will be sought in relation to the conceptual model developed in relation to the Territorial Impact Assessment of R&D, including the key headings identified in the Terms of Reference of:

- Research and innovation eg investment scientific and technological productivity
- Innovation capacity
- Human resources and mobility
- Research infrastructures, access to infrastructure, coordination of research activities
- Demographic indicators eg migration, population density, trends linked to urban poles
- Regional economic strength
- Labour market, training and education

The work package will require input of all partners according to geographical representation and language specialism, in order to review indicators available at a NUTS II and NUTS III level

Description of the Data sources (non-exhaustive)

Eurostat will serve as the primary transnational data source for the member and candidate countries. Within New Cronos from the REGIO domain ao the following indicators are available at a NUTS II or NUTS III level: Interregional migration, Population density, Population (by sex and age), Births and deaths (by sex and age), Gross domestic product, Non-national students in tertiary education, Pupils and students by level of education, Employment in high technology sectors, R&D expenditures, R&D personnel, (High-tech) Patent applications and Unemployment rates (by sex and age). Other transnational regional data sources are e.g. the *ERISA* benchmarking study and the European Regional Innovation Survey (*ERIS*). National statistical offices will serve a primary data sources for those indicators that are not available at a central level.

Description of investigation work to be carried out in order to establish a list of data to be requested

A review of the available (academic) literature and reports will produce a more profound insight in the indicators that have been used to assess the regional impact of RTD policies. Based upon proven availability and practicality, a first list of indicators will be compiled discriminating between those indicators for which data are (expected to be) available and those indicators indicated by the literature as first best but for which no data are available. Collecting data for this latter group of indicators will be part of the policy recommendations for future research.

The ESPON Data Navigator will be an additional source of principal data sources and contact points.

4. Compilation of indicators		
Key Tasks	**Key Partners Involved**	**No of days**
1. Prepare method for compiling and organising available indicators	MERIT	2
3. Review available literature on indicators at a European, national and regional level	MERIT	5
4. Specialist input of all partners according to geographical representation and language specialism, in order to review indicators available at a NUTS II and NUTS III level	All partners (identify indicators at national and regional level)	18
5. Compilation of indicators available at a European, national and regional level	MERIT	4
TOTAL DAYS		**29**

C. DEVELOPING THE CONCEPTUAL MODEL

Work package 5: Development and Application of Conceptual Model for Territorial Impact Assessment of R&D in Europe

Timescale: Months 2 - 24

Aim: The aim of developing the conceptual model will be to develop a territorial impact assessment methodology for all three dimensions of R&D policy – policy (contents and strategies), polity (institutions, organisations), politics (processes) in relation to spatial balance on EU territory.

The conceptual model will operationalise the policy options developed in the ESDP relevant for a territorial impact analysis of R&D policy in addition to drawing on previous experience to develop a methodology for impact analysis on a European and regional scale.

The model will take account of spatial concepts developed as part of ESPON priorities 1 and 3 and ECOTEC will keep in close contact with research projects under these priorities through the virtual network identified in Work package 1, task 5 above.

This work package will involve building (Months 2 – 8) and then applying and refining (Months 9- 24) the conceptual model. A first outline of methodology of the impact analysis will be available for the first Interim report in September 2002. The methods of the territorial impact assessment will be presented as part of the second Interim Report in February 2003.
This will include definition of appropriate indicators, typologies and instruments to detect regions and territories most negatively and positively affected by the identified trends with special reference to:

- Accessibility
- Polycentric development
- Environment
- Urban Areas
- Structurally weak areas

along with new methodologies to consider territorial information, as set out in the Terms of Reference. The development of typologies will draw firmly on those typologies developed as part of the ESPON research projects under priorities 1 and 3. This report will also include the presentation of a hypothesis on the territorial effects of R&D policy.

Application of the methodology will form the second phase of this work package, and a summary of the application process and analysis and revisions to the hypotheses previously developed will be provided as part of the third interim report in August 2003. A comprehensive report including results and first analyses oon R&D in Europe, spatial disparities and spatial effects will also be provided at this stage and will be supported by databases indicators and maps. The final report, will in turn include improvement of the methodology and the analysis taking into account the third interim reports of other ESPON projects and the opinions of representatives from the candidate countries. This will be delivered alongside a comprehensive presentation of the territorial impacts relating to the enlarged European Union of 27 countries.

At a European level, the conceptual model will need to look at the questions listed within the Introduction to the Methodology (SECTION) which can be summarised under the following headings and key factors:

- the spatial diffusion of innovation, knowledge and technology
- questions of enlargement and the experiences of border regions
- impact on regions lagging behind
- the emergence of polycentric development including development corridors, of urban areas as growth poles
- the influence of R&D on on-going European polarisation

At a Regional level, further focus will be necessary of impact of R&D policy on:

- access to research infrastructures and level of research activity
- level of research finance and human resources
- participation in private/ public funded research programmes
- participation in networks of excellence and the ERA
- linkages between private and public sector

and consequent impacts on:

- regional and urban economic development
- parity of access to infrastructure and knowledge
- competitiveness (of regions, urban areas and individual firms)

- human resource development including education and training levels
- level of innovation
- technology development
- technology transfer
- absorption of new technologies
- level of entrepreneurship and SME development
- investment levels
- development of human capital
- urban governance eg co-operation between universities and public institutions
- urban rural relations eg impact of research centres on small-medium size towns
- the diversification of the rural economy
- development of clusters

Consideration will need to be taken of territorial and economic conditions necessary for regions to take better advantage of R&D policy in terms of innovation and economic development eg

- accessibility
- availability of risk capital
- sectoral specialisation
- institutional 'thickness' and organisational cooperation
- financial infrastructure
- support for SMEs.

In addition the disfavourable conditions which minimise absorption are important, for example the role of structurally weak economies in affecting R&D investment due to poorly developed financial systems, lack of a dynamic business sector, low levels of support for SMEs

This work package will also need to take into account dynamism and for example change within the public sector in terms of infrastructure and research policy.

Key questions

Developing the conceptual model will require a focus on the following (non-exhaustive) list of key questions:

Conceptual considerations

- How far are the different aspects of the R&D process linked? How far, and in what ways, are innovation, R&D and technology linked? What other forms of innovation are there which do not link to R&D and technological development? How are these forms of innovation stimulated by R&D policy

ii. Spatial diffusion of R&D

- What is the nature of spatial diffusion of R&D, innovation and knowledge in Europe?

- To what extent is there variation in intensity of R&D between

  Different member states
  Different regions
  Regions with different industrial base
  Regions classified as lagging behind
  More peripheral regions

- Does Information Society contribute to a more harmonious territorial development in Europe? What are its adverse effects? How are these objected but also intensified by R&D policy at EU level?

- What is the spatial pattern in relation to the involvement of women in science?

iii. Polycentric development in Europe

- What is the link between the distribution of the most competitive firms and urban areas and the distribution of R&D investment?

- How far does the R&D policy support the concentration of development corridors, and further spatial effects in relation to polycentric development, eg the development of increased competitivenss within urban clusters in peripheral areas?

- Is R&D supporting increasing polarising tendancies within Europe or are there counter-weighting trends?

iv. The impact of different types of R&D measures

- What is the impact of public sector RTD funding (for example through the DG Research Framework Programmes, RIS, RITTS, mainstream Structural Funds, as well as National research policies).

- What is the impact of public support for private investment in research for example through State Aids.

- What is the role of national and regional policy in indirectly supporting research and innovation through encouraging venture capital and seed-corn funding, easing the planning process, and making available land also needs to be investigated.

- What are the different success rates for policy on innovation in terms of encouraging regions to develop innovation from regional resource bases, or in terms of importing innovation and new technology from other regions?

- How has R&D influenced the capacity for universities to work closely with companies and the private sector within their local region? How is commercial collaboration being supported?

- How have SMEs been encouraged to take up linkages with HE Sector – what role has European funding (eg Objective 2) played in encouraging this activity. What will happen if this support diminishes post 2006?

- What is the impact of international collaboration on research programmes? What is the impact of Framework programmes on local research capacity and longer term European linkages?

- How far are INTERREG III-C and are INTERREG III-B projects important to building research capacity?

V. The Effect Of Different Regional Contexts

- The territorial conditions which allow regions to take better advantage of R&D for innovation and economic development. In particular, an acknowledgement of the key role played by economic and social cohesion in absorption capacity of different regions in relation to RTD policy.

- Regional distribution of obstacles to entering careers in R&D (nature of education, gender, image of R&D) and to undertaking mobility in R&D

- How far is the new economy encouraging R&D away from old industrial areas, and towards new rural and peripheral areas?

- What is the differential impact of R&D policies on different regions, particular the less favoured regions and the peripheral regions.

- What are the linkages between R&D, participation in global markets and foreign investment at a regional level? How does this vary between different types of region?

- What is the influence of institutional factors at a regional level on regional impact, including
  a. Coordination of government, universities and private companies
  b. Coordination of EU, national and regional level funding

- How important are R&D clusters and the achievement of critical mass in R&D?

- What is the influence of industrial structure on investment in R&D and take up of R&D outputs?

- What are the regional factors influencing mobility in R&D?

- What is the relationship between R&D intensity levels and labour productivity? Why does this vary between different countries and regions?

- What is the role of accessibility in relation to R&D investment and development?

- The relationship between investment in knowledge based industries and knock on effects on R&D development
- How far does and how well does R&D policy self evaluate in terms of building pertinent and comparable indicators at regional level?

Developing the conceptual model will ultimately allow the team to address the following questions set out in the Terms of Reference:

- How far does the R&D policy affect the spatial diffusion of innovation and knowledge in Europe?
- What spatial effects are expected in terms of present and future bottlenecks of the R&D policy?
- The extent to which R&D policy addresses emerging border and integration problems, especially in the light of enlargement
- The extent to which R&D policy supports the concentration of development corridors, and polycentric development?

Developing a typology of regions or territories

Various typologies of regions or territories can be put forward, partly dependent upon the main focus of the work. In the present case, territorial typologies for R&D policies based on physical as well as functional characteristics can be envisaged. These might include such aspects as:

- *Working or Overachieving R&D regions*
- *Latent or underachieving R&D regions*
- *Potential or aspiring R&D regions*
- *Regions with little R&D base*

An alternative typology might focus around:

- *Regions converging on the EU average*
- *Intermediate regions*
- *Regions diverging from the EU average*

In practice the typology is likely to be more complex and, inter alia, will need to examine functional factors such as institutional diversity; breadth and depth of the R&D base; links to economic performance and innovation , and territorial factors such as peripherality, urban-rural regions, regions within accession country and regions with special geographic characteristic (mountains islands …) ie

Functional:

- *Industrial structure*
- *Level of institutional thickness*

Territorial:

- *Border-central region*
- *Peripheral-central region*
- *Urban-rural regions*
- *Prosperous-weak regions*
- *Region within accession countries*
- *Regions with special geographic characteristic (mountains islands …)*
- *Accessibility*

The territorial assessment of R&D policies would thus explore linkages to economic development and firm performance as well as addressing the linkage effects and networks established. The scale of these impacts would also need to be assessed. We would draw upon the work undertaken by ECOTEC for the ESDP Action Plan examining Territorial Impact Assessment in this aspect of the study, progressing the analysis through the proposed case studies and using the results of these to further refine the model developed.

Territorial Impact Assessment at a Regional Level

The aim will be to build a territorial impact analysis at a European scale (including accession countries). However it will also be necessary to consider the development of regional level TIAs for R&D. This will enable the research findings to assist in regional policy development, and to support subsidiarity in R&D policy.

5. Development for conceptual model for R&D policy		
Key Tasks	**Key Partners Involved**	**No of days**
1. Analysis of policy options identified in ESDP relevant for a territorial impact analysis of R&D policy	TAURUS	3
2. Analysis of previous work in the area of Territorial Impact Analysis and relevance to the current project	ECOTEC	4
3. Development of outline methodology of impact analysis at a European level for first Interim report	TAURUS	5
4. Development of hypothesis on the potential territorial effects of R&D for the 2nd Interim report	ECOTEC	5
5. Elaboration of conceptual model, including functional and territorial typologies	TAURUS	8
6. Application of model through territorial impact analysis (using data gathering and mapping against indicators, and individual case studies)	All partners (days included elsewhere in work packages)	

7. Improvement of the methodology after taking into account issues arising from application, views of partners and contents of other ESPON interim reports (where appropriate)	TAURUS	4
8. Comprehensive presentation of territorial impacts relating to the enlarged union (27)	ECOTEC/partners	included in WP 1 final reporting
TOTAL DAYS		**29**

Work Package 6: Indicator development

Timescale: Months 2 – 6

Aim: To develop consensus on indicators for use in assessing the territorial impact of R&D policy and to develop new indicators where necessary. Precise analysis of the availability and comparability of data at Community level will be necessary, including availability of data at NUTS III level. It will also be necessary to ensure coverage of indicators and data for the 12 candidate countries.

Requests will be made to EUROSTAT, EEA, National Statistical Institutes and Mapping Agencies as part of a two stage process. The first request will be submitted shortly after the first Interim Report in Septermber 2002, and the second by the end of 2002 at the latest

The final set of indicators to be used will be built both on the requirements of the conceptual model (developed in parallel under Work Package 5) and the availability of data at a NUTS II and NUTS III level. We would envisage selecting between 20 and 30 indicators.

The work package will conclude with the presentation of new territorial indicators including candidate and possibly neighbouring countries as part of the final report.

The team is aware of potential difficulties linked to the development of indicators in relation to R&D in Europe. In particular, these include:

- lack of baseline data;
- differences of data availability and comparability between Member States;
- lack of regional data

For example, the Final Report of the SPESP has already highlighted an absence of data in a number of different areas relating to R&D including location of company headquarters, persistence of enterprises with IT branches and the location of foreign direct investments.

.

The study will also explore the development of new indicators. We would envisage developing a variety of different indicators including:

- causal and impact indicators,

- simple and complex indicators,
- weighted indicators.

The development of a territorial impact analysis will undoubtedly require cross-referencing and the development of more complex indicators which required a more refined level analysis.

It has to be born in mind that measuring innovation capacity and RTD is a complex task. For example, there is a tendency to underestimate the innovation capacity of (rural, less developed) regions with high shares of SME, which often do not have explicit R&D departments and personnel and do not apply for patents although they may be very innovative. In addition, innovation in terms of products and processes are important factors within the increasingly dominant service sector, but these are relatively intangible in terms of developing indicators for measurement and benchmarking. Progress in the field of developing appropriate indicators has already been made through the Study Programme on European Spatial Planning and the recent development of the European Innovation Scoreboard which addressed the question of measurement, particular in relation to intangibles and the need to broaden the view on relevant indicators.

However the team will bear in mind the pragmatic nature of research and the need to develop clear messages and information to feed into policy at a number of different levels. The practical aspect of the study will have first priority to ensure the timely meeting of the set objectives.

Description of investigation work to be carried out in order to establish a revised list of indicators to be requested

The first task will compare the list of indicators developed under Work Package 4 and the conceptual model developed under Work Package 5 to draw up a second list of more focused indicators to be used in the later stages of the project. For these indicators data availability at a European, national and regional level will be checked. MERIT/ECOTEC will maintain close contact with Eurostat; all partners will maintain close contacts with the National Statistical Offices and/or other public or private sources according to their geographical representation. For those indicators for which data are either not available or only available on an ad-hoc basis, the respective data sources will be requested to (further) develop these indicators.

6. Development of indicators

Key Tasks	**Key Partners Involved**	**No of days**
1. Define appropriate indicators against initial conceptual model in consultation with other partnersand identify gaps in relation to the compilation of indicators resulting from WP4	MERIT	4
2. Assessment of data availability at a Community level, at NUTS III level, and for the 12 candidate countries	MERIT	4
	Other partners	12
4. Revise indicators following review of data availability	MERIT	3

5. Presentation of final set of indicators for use in implementation of the Conceptual Model	MERIT	2
6. First request for development of indicators by EUROSTAT, EEA etc	MERIT	2
7. Second, more elaborated request for development of new indicators by end 2002	MERIT	3
TOTAL DAYS		**30**

Work package 7: Database design and development

Timescale: Month 4- 5

Aim: The development of a database will allow a user-friendly mechanism for data collection against indicators which will be uniform across all partners

The database will be a multi-layered device for recording data gathered at a regional, national and European level against the set of indicators agreed by the research team. The information will be organised so that it can be accessed on a purely geographical basis, but also against a series of functional and territorial typologies developed as part of the Territorial Impact Analysis.

Database Development Specification

The database will be designed and developed using MS-Access 2000 and will be based upon a hierarchichal structure. The system will use a system based around a central Access database and a number of remote client databases (*Figure 1*). The remote applications, provided in either Access 97 or 2000, will be used for data entry at a local-level, while providing the capacity for data-upload to the central system, via e-mail transfer.

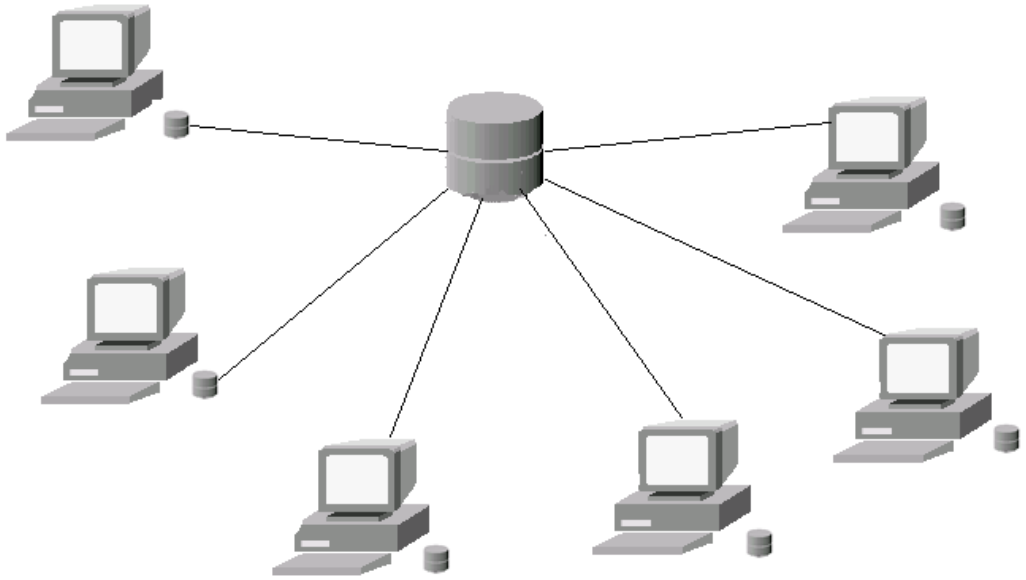

Figure 1

The database will be structured using the example criteria and relationships specified in *Figure 2*. This system allows for, for example a type of region to be entered into a central table within the application and data to be linked between the primary key and foreign key tables via one-to-many relationships. Thus, a number of territorial and functional typologies can be investigated.

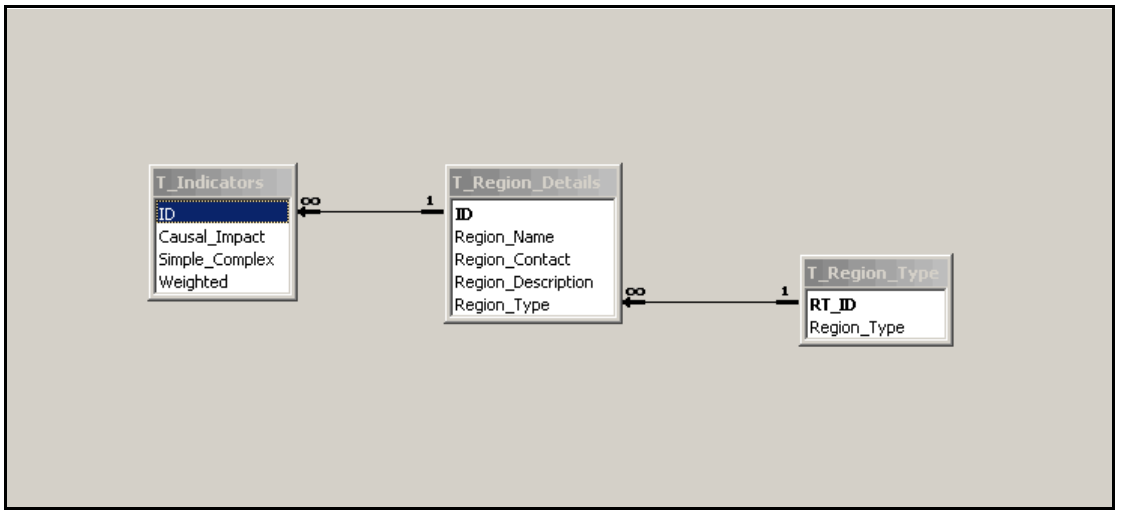

Figure 2

The database is designed to serve as link to the mapping system and to provide an additional forms-based user interface to enable data management and analysis at a network-level.

ECOTEC databases are designed to provide secure locations for a wide range of quantitative and qualitative data. Incorporating a range of security features, they provide ease of access for data inputting and versatility in querying and extracting

data within a dynamic environment. Created using a wide range of platforms, a strict back-up policy exists to ensure data integrity.

The database will be developed in Month 5 and therefore in time for the 2nd Interim report in February 2003. The final complete database will be presented as part of the final report.

7. Design and development of database

Key tasks	Key partners involved	No of days
1. Design of a database and collection methodology for the uniform collection of data in a way which will be suitable for GIS mapping techniques	ECOTEC	7
2. Database development	ECOTEC	10
3. Presentation of complete database as part of final report	ECOTEC	3
TOTAL DAYS		**20**

C. IMPLEMENTING THE MODEL

Work package 8: Data collection

Timescale: Months 7 - 18

Aim: This work package will involve the collection of data against the agreed set of indicators at European, national and regional to test the hypotheses set out in the conceptual model.

Data collection will occur against the indicators agreed by the team, at a number of different levels – European, national and regional. Secondary data will be sought in most cases through statistical sources such as EUROSTAT, national statistical offices. For those indicators where data is not available, we do not anticipate conducting extensive primary research across the whole European territory. However where possible from European Statistical and national sources, NUTS III information will be sought where possible. Regional level data (quantitative and qualitative) will also be sought through the 12 case studies.

8. Data collection

Key tasks	Key partners involved	No of days
1. Coordination of data collection against agreed indicators for the application of the conceptual model developed in Work Package 5 and quality control	ECOTEC	7
2. Data collection		
a. European level	ECOTEC	6
b. National/regional level	All partners (5x6)	30
3. Data entry	All partners (admin) (3x7)	21
TOTAL DAYS		**64**

Work package 9: Carrying out a mapping exercise to analyse territorial trends, potentials and problems deriving from R&D policy, at different scales, and in different parts of an enlarged European territory

Timescale: Months 1 - 24

Aim: To develop GIS mapping system appropriate for identifying of R&D trends across an enlarging Europe based on the collection of data against indicators set out in Work Package 8.

This work package will involve developing the mapping concept and consultation with partners (Months 1 – 6), mapping the available data (Months 7 – 18) and developing the final set of maps with emphasis on user-friendliness and policy relevance (19 –24).

A key aspect to this process will be the mapping of:

- Public and private investment in R&D
- Scientific and technological productivity
- Presence of research infrastructure
- Innovation capacity eg loans, seed funding available, SME participation in R&D)
- Human resources and mobility (eg level of education and training)

And a mapping of R&D against other factors to be identified in the conceptual model of Territorial Impact such as:

- Productivity
- Level of employment
- Regional growth
- Patterns of investment
- Development of human capital
- Growth of urban centres
- Urban governance arrangements and Institutional 'thickness' ie joint working between public, private and academic institutions

A further aspect of the use of mapping will be the modeling of future scenarios as to R&D development and impact in Europe.

Mapping will work with new geographical observational tools where possible and will use low NUTS levels. The mapping exercise will also incorporate developing a typology of regions which will reveal risks and potentials for these different regions.

The work to be made by Mcrit within the work package will include three different work activities:

1. Development of the GI mapping system which will be used
2. Integration of indicators and data available from the study

3. Production of maps, graphics and other outpus for visualisation

Development of the GI mapping system which will be used

Mcrit will start by providing all participants in the peoject a set of simple but clear rules for data documentation (metadata procedures) and data format compatibility (based on standard formats available in the market). Once agreed on these basic compatibility rules, Mcrit will collect and assemble data provided by different participants and integrate it in a single harmonised system.

The system to be developed will use as simple as possible technology for database management and mapping, in principle at Microsoft Office level (Microsoft ACCESS, EXCEL, Mapinfo).

Additionally, Mcrit will develop a user-friendly interface for novice users on Java, free of royalties, so the whole database could be disseminated and used more easily though CDRom and Internet.

Mcrit will host in its own server the harmonised database and provided restricted use of it to all project participants. Once agreed by the participants and the Commission, the access could be open to third parties and to the general public if required at the end of the project and during six months afterwords.

A master copy in CDRom of the whole system will be provided as a deliverable.

Integration of indicators and data available from the study

The data, once received, will be validated, documented, and included in the general metadata.

Mcrit will provide all necessary cartographic basis (administrative zones down to NUTSIII zones, cities, networks and geographic reference features).

Additional to the indicators already provided by project participants, the system will have its own functionalities for defining and calculating new kind of indicators. For this, Mcrit will develop an specific user-interface in Microsoft EXCEL, linked to the system, or a Java routine, in case this facility is considered useful to be used through Internet.

Production of maps, graphics and other outpus for visualisation

Mcrit will propose a uniformed graphic design style for all outputs to be produced, as well as the specific characteristics of each type of map to illustrate basic data and indicators.

Mcrit will produce in paper at the scale and format to be decided by participants (from DINA4 up to DINA0) all maps and graphics needed. It will store each map in electronic version to be disseminated through Internet and CDRom.

Addicionally, Mcrit will provide user-friendly functionalities in the system so any interested novice user can make their own maps, using or no the recommended design criteria adoped for the outputs of the study.

9. Mapping

Key tasks	Key partners involved	No of days
1. Consultation with partners as to mapping requirements for the research project	MCRIT	2
2. Development of GIS mapping system	MCRIT	8
3. Consultation with partners on appropriateness of mapping system against conceptual model for territorial impact assessment	MCRIT	2
4. Creation of maps for analysis by TPG as part of impact analysis process	MCRIT	17
5. Use of map based systems to model hypotheses for future development of R&D at a European, national and regional level	MCRIT	4
5. Communication of research findings and hypotheses to wider audience via mapping techniques	MCRIT	4
TOTAL DAYS		**37**

Work package 10: Case Studies

Timescale: Months 8 - 16

Aim: A series of regional case studies chosen on the basis of territorial and functional typologies to investigate aspects of the conceptual model at a regional level and in more depth

The case study regions will be identified on basis of territorial and functional typologies developed within the conceptual model. They will include a focus on:

- Border regions
- Institutional arrangements within regions
- RIS/RITTS regions
- Regions involved in current Art 4 of ERDF projects

The aim will be to use the case studies to pilot the territorial impact assessment of R&D policy at a regional level, to elaborate on quantitive findings gained at a European level and to analyse specific issues such as:

- The particular experience of border regions,
- the impact of regional programmes such as the RIS, RITTS and Article 4/10
- the role of institutional factors in relation to R&D intensity and impact
- the interlinkages between EU, national and regional R&D policy as they operate on the ground

Each case study will be progressed through a mix of desk research and interviews with regional partners and key stakeholders including public and private sector research facilities, end-users, officials responsible for managing EU, national or regional programmes, where these can be identified. A focus group with key stakeholders may also form part of the case study process. Within each region the research will seek to:

- Set out the nature of R&D activities;
- Assess the effectiveness of public funded research investment in the region
- Assess the synergies between public and private funded research
- Assess the synergies between European, National and Regional funding programmes
- The influence of indirect public policy such as planning requirements, the availability of risk capital and support for enterprise
- Assess the output factors, in relation to impact of R&D on the regional economy and human capital
- Identify any key obstacles to uptake of R&D including barriers to R&D and science and technology professions and mobility
- The extent of transnational cooperation

We therefore propose that each expert conducts two in depth case studies within the countries which fall within their geographical area and knowledge base, leading to a total of 12 case studies.

We estimate that case study visits would last for three full days, inclusive of travel time, and would consist of in-depth qualitative interviews with stakeholders. Time has also been set aside for each expert for desk research including institutional analysis and for the arrangement of visits and writing up case studies.

10. Case studies

Key tasks	**Key partners involved**	**No of days**
1. Drawing up method for sampling case studies on basis of territorial and functional typologies	ECOTEC	4
2. Development of questionnaires and interview pro-formas for each type of case study	ECOTEC	4
4. Allocation of 12 case studies to individual partners on basis of expertise and geographical location	ECOTEC	1
5. Carrying out desk research and institutional analysis in relation to R&D where appropriate including:	Each partner (on basis of 2 case studies per partner)	18

6. Initial contacts and carrying out interviews with main regional and national partners	All partners	36
7. Writing up case studies	All partners	36
8. Development of case study report to feed into conceptual model of Territorial Impact Assessment	ECOTEC	5
TOTAL DAYS		**104**

D: POLICY RECOMMENDATIONS

Work package 11: Deducing recommendations for future policy development in support of territorial cohesion and the ESDP

Timescale: Months 18 - 24

Aim : To develop timely recommendations for future policy development in support of territorial cohesion and the ESDP, identifying how R&D policy can avoid negative spatial effects, and promote balanced and competitive development. Policy recommendations will be made at a variety of different levels, so that regional, national and European policy actors can all benefit from the findings of the research project. They will be thematic, but will also include recommendations on institutional arrangements for better coordination of R&D policy

The recommendations will set out as according to the Terms of Reference:

- How should R&D policy at the EU and member state levels be designed and coordinated to promote equal access to knowledge infrastructures for all European territorities and;

- How could the Structural Funds and R&D policy develop a more coherent and effective approach in promoting R&D capacities and territorial cohesion.

First propositions on the improvement of R&D policy and R&D instruments will be provided as part of the third Interim report in August 2003, in addition to a first proposition on the institutional aspects of the spatial coordination of EU sector policies. This will be followed in the Final Report by a formulation of conclusions and propositions of possible thematic policy adjustments regarding R&D policy and its spatial impact. The final report will also include a definition of institutional settings and instruments which could better support a coordiation of R&D policy towards spatial concerns.

The deduction of policy conclusion has to be embedded into a reference framework in order to received coherent and applicable results. The deduction of policy conclusion must always make reference in terms of the general policy orientation

- to the objectives which are explicitly of implicitly envisaged,

- to the underlying spatial concepts and the spatial development paradigm
- to a regional typology which adequately describes the thematic matter involved in order to see the analytical base

Furthermore it must be explicitly indicated in terms of the delivery mechanism:

- The instruments and the instrumental mix, which should be employed in order to achieve the above mentioned concepts
- The governmental level in charge with consideration of the distribution of competences between the EU and other levels.1

This kind of general structure, which will be further refined must be provided to the wider team as a general frame for the preparation of their policy conclusions. This approach will allow comparing the different approaches followed by the team. This approach will also allow making proposal for integrated policy proposals with reference to the main spatial and sectoral policies with a spatial bias.

Reference framework for evidence based policy conclusions

<table>
<tr><th></th><th></th><th>Spatial development policy</th><th>Structural Funds Policy</th><th>R & D policy</th><th>Other relevant</th></tr>
<tr><td rowspan="2">1. General Policy orientations:</td><td>A) Objectives →</td><td colspan="4" rowspan="2">Reference to
• territorial typologies
• appropriate tools
• …..</td></tr>
<tr><td>B) Policy concepts and strategies →</td></tr>
<tr><td rowspan="2">2. Main Delivery mechanisms:</td><td>C) Policy instruments →</td><td colspan="4" rowspan="2">Reference to
• combination of instruments
• Interactions between governmental levels
• Best practice examples
• ….</td></tr>
<tr><td>D) Implementation, governances →</td></tr>
</table>

Key questions to be addressed for policy conclusions.

The consideration of the spatial approach for all policies in general:

- What are the most relevant spatial concepts in the future?
- Which should be the main spatial categories and typologies as reference for the spatial approach such as urban poles, island and mountain areas types, structurally weak areas and rural areas?
- Are there any kind of spatial hierarchy identified ranging from global integration zones to remote rural areas, which are interesting for policy-making?

1 Concerning the nation and regional level it can only be made reference to the main distribution of power. An complete account of all specific situations in all states can only be made in a "typical case approach".

- Which kind of spatial typologies are in particular appropriate for the Structural Funds Policy in the future taking into account that the accession of candidate countries will create, on the one hand, new challenges but, on the other hand, will reduce the resources available in average?
- Which are in that case the most appropriate instruments and the policy delivery mechanisms?
- What is the value added using a spatially orientated approach in Structural Funds and sector policies?
- How far those aspects already considered in the ESDP – assessment of the ESDP with further conclusions for a revisions?
- Where are weakness and strength of the ESDP?
- Which spatial concepts should be strengthened in the ESDP so it can better act as references frame for other policies?
- How far is it necessary to address specific sectoral issues, and which should be addressed taking into account the important drivers of the spatial development?

The policy recommendations will always be connected with the adequate analytical tool in order to proof the scientific evidence related with the policy recommendations

11. Policy recommendations

Key tasks	**Key partners involved**	**No of days**
1. First propositions on improvement of sector policy and instruments for Third Interim Report	ECOTEC	3
2. Developing policy recommendations on a European scale	ECOTEC/MERIT	4
3. Developing policy recommendations aimed at other regional and national players	ECOTEC/MERIT	4
4. Developing mechanisms of disseminating policy at appropriate levels	ECOTEC/MERIT	4
5. Disseminating information	ECOTEC	4
6. Preparation and presentation of main policy findings at seminar at month 12 of project and through identified mechanisms above on behalf of the Transnational Project Group	ECOTEC	3
TOTAL DAYS		**22**

The table which follows this section sets out the timing of the various aspects of the work programme.