

SPECIFICATION

ESPON Applied Research Project 2013/1/4

CLIMATE CHANGE AND TERRITORIAL EFFECTS ON REGIONS AND LOCAL ECONOMIES (2009-2011)

(o) Territorial challenges relevant for ESPON 2013 projects

The development of the European territory is facing several ongoing mega trends and impacts of policies:

- The integration of the EU in global economic competition is accelerating, offering regions and larger territories more options to decide their development path, as development is no longer a zero sum game for Europe.
- Interaction is growing within the EU territory and between the surrounding neighbour countries and other parts of the world. This is apparent through e.g. migration pressure on more developed countries, which are themselves confronted with population decline, and by access to and investment in new markets.
- Market forces and the evolution of society in general support a geographical concentration of activities.
- The ongoing demographic changes with an ageing European population, in addition to migration, affect regions differently and increase the competition for skilled labour.
- The occurrence of hazards due to climate change is increasing and different parts of Europe experience different types of hazards.
- Increasing energy prices and the emergence of a new energy paradigm have significant territorial impacts, some regions being more affected than others. This presents particular development opportunities for the production of renewable energy sources.
- The enlargement of the EU to 27 Member States, and potentially more, presents an unprecedented challenge for the competitiveness and internal cohesion of the Union.

ESPON results have revealed that territorial capital and opportunities for development are inherent in the regional diversity that is a characteristic of Europe. Consequently, different types of territories are endowed with diverse combinations of resources, putting

them in different positions for contributing to the achievement of the Lisbon and Gothenburg Agendas, as well as to Cohesion Policy. Territorial diversity, especially in the economic base, implies that strategies other than opting for a knowledge-based economy might be more appropriate and viable for some regions.

The ESPON 2006 Programme provided integrated analysis and long-term spatial scenarios which enriched the European policy debate and knowledge base. The results and observations on territorial structures, trends, perspectives and assessment of EU policy impacts had not been fully evident before and supported a better understanding of the European dimension of territorial dynamics. This has prompted interest among policy makers and practitioners for even more information, knowledge and understanding that ESPON can offer.

The ESPON 2013 Programme shall bring this knowledge base one step further through applied research and targeted analysis, indicator development and data collection, capitalisation events presenting results, etc. All these actions will be related to an improved understanding of territorial structures, development trends, perspectives and policy impacts.

The European-wide evidence provided by the ESPON 2013 Programme will potentially benefit stakeholders at all levels throughout Europe. Policy makers dealing with territorial development require sound evidence and comparable regionalised information in addition to medium and long-term development perspectives, in order to create sustainable and efficient integrated policy responses for their territories.

Given that the European Union is moving towards a more integrated policy approach, the territorial dimension is particularly important for policy makers. The aim of territorial cohesion proposed by the Commission supports this approach by taking the territory as an element within the framework of policy making. Due to the provision of evidence based on analyses of territorial units, the ESPON 2013 Programme is of strategic importance for European policy development and cooperation.

By further developing and expanding the existing knowledge and indicators, the ESPON 2013 Programme will play a strategic role in supporting the policy process of the 2007-2013 period, and contribute to the development of Cohesion Policy.

(i) General objectives of applied research projects under Priority 1

The general objectives of applied research projects within the ESPON 2013 Programme are as follows:

- Building new evidence based on comparable information about European regions and cities, including information on dynamics and flows, and covering the entire territory of EU 27, Iceland, Liechtenstein, Norway and Switzerland.

- Addressing major territorial challenges and political priorities providing comparable information covering the entire European territory, its regions and cities.
- Providing comparable regionalised information and possible policy options for making use of opportunities inherent in territorial structures; anticipating and counter balancing negative trends and structures, taking into account the diversity of the ESPON territory and considering institutional, instrumental and procedural aspects.
- Identifying types of territories, regions and cities that share common development challenges and are affected most (positively or negatively) by the identified structures, trends, perspectives and/or policy impacts.
- Contributing to the further identification of structures within the EU territory that represent options for exploring comparative advantages and provide synergy through territorial cooperation arrangements, involving regions and/or cities.
- Contributing to the improvement of the scientific platform for European applied territorial research by refining existing concepts, methodologies, indicators, typologies, European maps and models and by defining new ones.
- Providing the knowledge and competence capabilities needed to ensure scientifically validated results of the applied territorial research with the support of Sounding Boards¹.
- Supporting the use of and dissemination of results to an audience of policy makers, practitioners, scientist and experts.

This project shall contribute to these general objectives during its implementation, and in doing so make best use of existing ESPON results, new results in other ESPON projects as well as other research results and relevant studies.

(ii) Relation of this project to the ESPON 2013 Programme

The priorities describing the work-programme of the ESPON 2013 Programme are structured in four strands:

1. Applied research on territorial development, competitiveness and cohesion: Evidence on European territorial trends, perspectives and policy impacts

The applied research projects will create information and evidence on territorial challenges and opportunities for success in the development of regions. Cross thematic applied research will be a major activity integrating existing thematic analysis and adding future analysis of new themes. Territorial impact studies of EU policies will be another focus under this priority.

¹ For each applied research project a Sounding Board will be set up, accompanying the project throughout its life cycle and giving advice to the TPG on both, scientific issues as well as relevance for policy makers. Sounding Boards will normally be made up of one scientist and one practitioner. Their tasks will consist of assessing project proposals, giving continuous feedback to TPGs and commenting on their reports.

2. Targeted analysis based on user demand: European perspective on development of different types of territories

This priority responds to a clear demand of practitioners for user and demand driven actions within the ESPON 2013 Programme. By convening an analytical process where ESPON findings are integrated with more detailed information and practical know-how, new understanding of future development opportunities and challenges may arise, which could be transformed into projects and actions.

3. Scientific platform and tools: Territorial indicators and data, analytical tools and scientific support

The scientific platform and analytical tools built up within the ESPON 2006 Programme will be maintained and further expanded. New actions shall be undertaken to develop current achievements and make use of existing indicators, data and tools.

4. Capitalisation, ownership and participation: Capacity building, dialogue and networking

Under this priority, actions are foreseen that will make the evidence and knowledge already developed operational through raising awareness and involving stakeholders in the results and practical application of them.

A strong coordination and interlinkage with other ongoing ESPON projects is crucial for achieving comprehensive results. A close cooperation with the appointed Sounding Board and the Coordination Unit must also be established as part of the project implementation.

This project belongs to the first priority. It holds a key position in developing a common understanding of future energy demands in different European regions and sectors as well as the elasticity of regional energy consumption. Knowledge of these issues is vital for targeted policy development in the light of Cohesion Policy aiming, inter alia, at improved regional competitiveness and sustainable economic growth in Europe's regions.

(iii) Thematic scope and policy context

Climate change is one of the major territorial challenges confronting Europe and the entire planet. In recent years this issue has become a central concern for both, the general public as well as decision makers, owing to frequently occurring extreme weather events (e.g. heat waves, flooding, etc.) and their consequences on the environment, society, and regional and local economy. Reports such as the Stern Review on the economics of climate change and the 4th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) have been pivotal in raising awareness about the cost of inaction and the human interference with the Earth's climate system. While these reports are not the first of their kind, they are by far the most significant in terms of lifting the issue of climate change to the top of the political agenda.

In the broad sense, the concept of climate change refers to the variation of global or regional climate over time, which can, in principle, be caused both by natural forces and human activity. Today, however, the term often implies human caused global warming.

The IPCC report confirms this relation, stating that more than 50% of the observed increase in global average temperature since the mid-20th century is very likely (confidence level > 90%) due to the observed increase in anthropogenic greenhouse gas concentrations and that the probability that this is caused by natural climatic processes alone is less than 5%. In addition, the Stern Review suggests that climate change threatens to be the greatest and widest-ranging market failure ever seen. The author points out that human actions over the coming few decades could create risks of major disruption to economic and social activity later this century, and in the next, on a scale similar to that associated with the great wars and the economic depression of the first half of the 20th century.

The effects of climate change have become apparent and tangible for many people in recent years. The heat wave in Europe in the summer of 2003 is but one example in this respect, followed by numerous heavy precipitation events causing extreme flooding affecting water quality, crops, human settlements and infrastructure in many regions of Europe. According to the IPCC report, climate-related hazards will mostly increase, although changes will vary geographically. The report further indicates that climate change is likely to magnify regional differences of Europe's natural resources and assets, which could counteract endeavours of EU Cohesion Policy. One of the IPCC's conclusions is that studies disaggregated to the regional and even local scale are urgently required. The organisation also identified a strong need for scenarios at regional and local scales to enable appropriate impact assessments.

Over the last few years the EU has financed several large research projects on regional climate modelling and impact assessment, some of which produced maps representing the projected changes in climate variables as well as projected impacts. In its Green Paper "Adapting to climate change in Europe – options for EU action", the Commission uses various existing project results to present those European areas that are most vulnerable to climate change. On that basis it becomes clear, that all of Europe has been and will continue to be affected by climate change, even though by different types of impacts, and with a very diverse geographical distribution on the European territory. Therefore, the Commission strongly advocates timely adaptation measures, for which a "flexible four-pronged approach" is suggested. Furthermore, the Commission indicates that more research is needed to address the gaps in understanding global warming and its potential impacts on the environment.

In light of this, the project should strive to achieve a better understanding of the following key policy questions, for which it should provide supporting information and evidence:

- How and to which degree will climate change impact on the competitiveness and cohesion of European regions and Europe as a whole?
- In which way can policy contribute to mitigate climate change, and to adapt to and manage those results of climate change that cannot be avoided, while making sure that synergies of mitigation and adaptation policies are being exploited?

The perspective of applied research under this measure shall be guided by the objective to identify broad development perspectives and trends for the different types of regions and cities, also in the light of the Lisbon/Gothenburg agenda.

Coordination should take place with other relevant ongoing ESPON projects (above all the projects on “Impacts of the new energy policy”, “Development opportunities in different types of rural areas” and “Demographic and migratory flows affecting European regions and cities”).

(iv) Analytical framework and deliveries expected

The project shall take its starting point from the above mentioned most recent IPCC reports, particularly the panel’s definition of climate change as well as the scenarios developed.

The impacts of climate change on European regions as well as on regional and local economies are the main research issues of the project. The relation between climate change and natural hazards was already addressed in the framework of the ESPON 2006 Programme. Apart from using the IPCC results as starting point for the research, the project should therefore also consider other existing data and indicators. The data, indicators and maps of the ESPON 2006 Programme are one important source in this respect. This project shall in particular be informed and make use of relevant results from the following projects:

- ESPON project 1.3.1 on spatial effects of natural and technological hazards represented a spatial pattern of natural and technological hazards on NUTS 3 level in the ESPON 2006 countries. By doing so, the project also looked into the influence of climate change on the probability of occurrence of certain hazards in a long-term perspective.
- ESPON project 3.2 on spatial scenarios in relation to the ESDP and EU Cohesion Policy also included climate change determinants into the different scenarios and analysed the respective implications.

The project should strive for a comprehensive and integrated research approach, taking into account social, cultural, environmental, and economic aspects. In addition, a 3-level-approach (European, transnational/national, regional/local) to the analysis, commonly used by all ESPON applied research projects, should be applied in order to support a clear presentation of results, which might vary depending on the geographical scale.

Given the concrete design of the applied research project and its work packages, the project is expected to answer the following key research questions:

- What is the degree of vulnerability of different types of European regions to climate change? How will variations in different individual climate change parameters (e.g. increased precipitation; higher temperatures; more frequent storms, droughts, forest fires; etc.) impact on these regions in economic, social, and environmental terms? What are the adaptive capacities of these regions and to which degree can they be further enhanced?

- What are territorial potentials for the mitigation of climate change in different types of European regions (in relation to e.g. renewable energy, carbon sinks, energy saving)?
- Are there potentially new types of regions emerging, revealing the same characteristics regarding both, their adaptation and their mitigation capacities? What are the interdependencies among different types of European regions?
- How and to which degrees are the different sectors of regional and local economies (e.g. agriculture, forestry, tourism, the construction industry) as well as regional and local infrastructures going to be affected by climate change? How could these impacts, in turn, affect water management in the different types of regions?
- What could be social and cultural implications of the aforementioned possible developments (e.g. regarding employment, standards of living and welfare in different regions)? Will climate change impacts affect migration within and/or from outside Europe both, in the short term and in the long term? If so, what will be the likely effects for which type of regions?
- Are there potential new development opportunities for European regions in the wake of climate change a) through adaptation (e.g. new variety of grape plants) and/or b) through mitigation (e.g. new wind power)? If so, which ones are there and how could they be exploited to achieve more competitiveness both, on regional as well as on European scale?
- Which mitigation² and adaptation³ measures could be applied in the different types of European regions to cope with climate change? How can territorial policies contribute to mitigation (e.g. what are necessary requirements for more sustainable transport modes)?

In order to receive some more focused and detailed information, a limited number of well targeted case studies shall be included in the research on the development opportunities and threats of the types of regions that are most vulnerable to climate change.

In order to create coherence with project findings of other ESPON applied research projects, the project should present the main final results in relation to different types of regions and cities, using existing typologies for the urban system, rural areas, mountain

² “Mitigation – A human intervention to reduce the sources or enhance the sinks of greenhouse gases. Examples include using fossil fuels more efficiently for industrial processes or electricity generation, switching to solar energy or wind power, improving the insulation of buildings, using energy saving light bulbs, and expanding forests and other “sinks” to remove greater amounts of carbon dioxide from the atmosphere.”

³ “Adaptation – Actions taken to adjust natural ecosystems or human systems so they can cope with changing climate conditions, the aim being to reduce potential harm or exploit potential benefits. Examples of such actions include designing spatial plans and building codes to account of potential climate change and extreme weather events, building walls to protect houses from floods, switching to agricultural crops and forestry species that are better suited to a changing climate.” Other important adaptation actions not included here and particularly relevant for Mediterranean countries are the preparedness for wildfire emergencies and water resource management.

Both definitions are taken from Commission of the European Communities (2007): Commission Staff Working Document Accompanying the Green Paper from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions. Brussels.

areas, islands, coastal areas and outermost regions. The final results should also be presented for transnational cooperation areas under Structural Funds, and - where appropriate and possible - also for cross-border cooperation area and inter-regional cooperation areas.

The geographical coverage of the project should encompass all the countries participating in the ESPON 2013 Programme. Furthermore, the TPG should assess the data situation within their field of research in the EU Candidate Countries (i.e. Croatia, The former Yugoslav Republic of Macedonia, Turkey) and/or the other countries of the Western Balkans (i.e. Bosnia and Herzegovina, Serbia, Montenegro, Albania, Kosovo under UN Security Council Resolution 1244), and report their findings in the Inception report (see below chapter (v)). Depending on the respective data situation these countries would then be included in the analysis.

The deliveries of the project should make use of and complement the existing scientific platform and tools of ESPON, which are accessible on the ESPON website. The project is expected to enhance the scientific platform of ESPON through the following deliveries:

- Data input to the development, update and extension of the ESPON database by additional data on regional vulnerability to climate change at present and their probable vulnerability in 10-20 years time (preferably NUTS 3 level) gathered within the project, particularly in relation to the new Partner States Iceland and Liechtenstein. Indicators need to offer compatibility with a map-making facility, to provide a consistent, homogenous, reliable, and up-datable database.
- Indicators offering additional information on the impact of climate change on different sectors of regional and local economies, as well as on local and regional infrastructures, and new complex indicators, revealing regions' and cities' socio-economic situation, the degree of vulnerability to climate change of these regions, as well as their change in competitiveness due to climate change.
- Typologies of European regions classifying (1) the degree of vulnerability to climate change, (2) the adaptation and mitigation capacities, (3) the impact of climate change on regional and local economies and thereby also on competitiveness, and (4) those benefiting from climate change by gaining new development opportunities.
- Case studies on the development opportunities and threats of the types of regions that are most vulnerable to climate change.
- European maps revealing (1) the degree of vulnerability of different types of European regions to climate change, (2) their adaptation and mitigation capacities, (3) the various types of impact of climate change on regional and local economies as well as on local and regional infrastructures, (4) the territorial dimension of mitigation and adaptation measures to climate change and (5) development opportunities of cities and regions for competitiveness and cohesion in the wake of climate change.

Regarding the development of new data and maps and/or the use of existing data, the TPG is expected to cooperate closely with the TPG being in charge of the development of the ESPON 2013 Database.

The results and conclusions of the applied research within the project should be formulated in relation to policy orientations present at European level and make use of the new typologies – if applicable – and maps resulting from the project.

Following the logic of the Territorial Agenda of the EU, orientations for policy makers should refer to the respective territorial development opportunities and the available options to mobilise these for the benefit of the cities, urban agglomerations and surrounding regions in question. In this respect, references to future policy options should take account of European Cohesion Policy orientations, in particular expressed in the Community Strategic Guidelines on Cohesion 2007-2013 and the Fourth Report on Cohesion.

Project findings should make clear which impact climate change could have on the competitiveness and socio-economic situation of European regions and cities as well as on the realisation of economic, social and territorial cohesion in Europe.

Finally, the project should consider avenues for further applied research on the theme.

(v) Outputs and timetable

One of the main objectives of the ESPON 2013 Programme is to focus on research with policy relevance and to contribute to the development of relevant policies. Therefore, the outputs of the research project should be highly operational and coordinated in time, as much as possible, to fit into the relevant political agenda.

The proposal for the project is expected to reveal individual work packages on project coordination, research activities, and dissemination, as well as a schedule for project implementation based on the following timetable and specification of outputs:

April 2009 (Inception report):

Twelve weeks after the Kick-off Meeting will have taken place a more in-depth concept should be submitted by the TPG allowing for a detailed overview of the research approach to be applied, the methodology and hypothesis for further investigation, as well as a review of the main literature, data sources, etc. The Inception report shall also include an overview of more detailed deliveries and outputs envisaged by the project as well as an indication of likely barriers that the project implementation might face. The report shall give clear orientation for the applied research previewed towards the Interim report. The research team should also report on the findings regarding the assessment of the data situation in EU Candidate Countries and/or other countries of the Western Balkans, on that basis, determine the geographical coverage of their research. Finally, the TPG should outline how it envisages making use of existing ESPON results that are relevant for this project.

October 2009 (Interim report and special delivery):

The content of the Interim Report shall reflect the orientations given in the Inception Report as well as the results of the discussions having taken place with the Sounding Board.

The Interim report is envisaged to include elements such as:

- a) Preliminary results on the basis of available data, developed indicators, typologies, and European maps, including
 - First assessment of the degree of vulnerability of different types of European regions.
 - First indicative identification of potential new types of regions, emerging in the wake of climate change.
 - First indicative identification of climate change impacts on different sectors of regional and local economies.
 - First assessment of potential new development opportunities for European regions due to climate change.
 - First indicative identification of mitigation and adaptation measures in the different types of European regions.
 - Data collection achieved, including an overview on statistical and geographical data collected by EUROSTAT, and national Statistical Institutes etc.
 - Draft European maps.
 - First indications on the conclusions and policy relevant options that could be the outcome of the project.
- b) Plan for the applied research towards the draft Final Report as well as the Table of Content envisaged.

As a special delivery, a short report related to the progress made included in the Interim report is vital at this particular point in time. The short report is envisaged to feed into the discussions in the framework of the United Nations Climate Change Conference to be held from 30 November to 11 December 2009 in Copenhagen.

Therefore this report should, in an easily understandable way, present the results of the project at that point in time in a condensed manner (max. 20 pages). It should give an outlook to the further research and the expected contribution to existing knowledge on territorial effects of climate change for the entire European territory, particularly related to regions and local economies.

October 2010 (Draft Final report):

The Draft Final report will take into account feed-back on the Interim report from an ESPON Seminar and by the Sounding Board. The report is supposed to include elements such as:

- c) Report (max. 50 pages) on the main results, trends, impacts and options for policy development, including key analysis/diagnosis/findings and the most relevant indicators and maps (any additional information should be included in a scientific report).

Particularly important are options for policy makers, which could provide the basis for interventions related to development opportunities for improving European competitiveness and cohesion.

d) An executive summary (max. 10 pages) summarising the main results of the applied research that can be communicated to a wider audience of stakeholders. This summary should be based on the Report mentioned above.

e) Scientific report documenting the scientific work undertaken in the applied research including elements such as:

- Literature and methodology/theory used.
- Typologies and concepts developed and used.
- Data collected and indicators used, including tables with the exact values of indicators.
- Maps produced in support of the results, covering the territory of EU 27, Iceland, Liechtenstein, Norway and Switzerland.
- Tools and models used or developed.
- Future research avenues to consider, including further data requirements and ideas of territorial indicators, concepts and typologies as well as on further developments linked to the database and mapping facilities.

The MC and the Sounding Board will address the Draft Final report and eventually ask for clarifications.

February 2011 (Final report):

f) Revision of the Draft Final report on the basis of comments received.

February 2011 – August 2011 (dissemination):

g) Dissemination of project results by the TPG in the framework of international conferences and seminars, e.g. transnational activities of the ECP Network, events organised by the CU. These activities need to be reflected in the budget proposed by the TPG for the implementation of the project.

Please note that the submission of the respective reports is due at the latest by the last working day of the respective month.

In order to justify expenses claimed for refunding by the TPG, a short progress report (max. 10 pages) has to be submitted to the CU every six months during the project's period of implementation. This should consist of an account of progress in the individual work packages according to the schedule in the proposal. The report also should allow an overview on the development of the project regarding development and use of methodology, results at different steps and next steps to be taken within the following six months.

Irrespective of the above mentioned reports to be submitted at certain stages in the project life cycle, the TPG is expected to give presentations on the state of their research or/and the results in the framework of internal and external ESPON seminars. Therefore, when

setting up the project proposal, the TPG should also allow for travel expenses for the attendance of ESPON seminars.

(vi) Budget for the applied research project

The maximum budget foreseen for this applied research project amounts to 1.000.000 € including VAT, if applicable. Proposals exceeding this value will not be considered.

All real eligible costs incurred for carrying out the approved project will be refunded 100% by the ESPON 2013 Programme.

(vii) Existing access points

Synergies and use of results from outside the ESPON regime shall be sought. In particular, research activities by international bodies like the European Environment Agency, the ESPACE Project on “European Spatial Planning Adapting to Climate Events” (www.espace-project.org) and the Joint Research Centre of the European Commission might be valuable for this project.

The other access points listed below can serve the purpose of providing the TPG useful information for preparing a proposal. It is by no means meant to be exhaustive, but should be considered as information that can be helpful in tracing additional useful background information.

- ESPON projects results, data and maps: www.espon.eu
- Intergovernmental Panel on Climate Change (2007): Climate Change 2007. 4th Assessment Report. <http://www.ipcc-wg2.org/index.html>
- European Environment Agency (2007): Annual European Community greenhouse gas inventory 1990–2005 and inventory report 2007.
- European Environment Agency: also for indicators, e.g. <http://www.eea.europa.eu/themes/climate/indicators>
- COP 15 - United Nations Climate Change Conference Copenhagen 2009: <http://www.cop15.dk/en/>
- International Energy Agency (IEA): several publications and indicators, http://www.iea.org/Textbase/subjectqueries/keyresult.asp?KEYWORD_ID=4106
- Stern, N. (2007): The Economics of Climate Change. The Stern Review.
- OECD Environment Directorate, working on Climate Change : http://www.oecd.org/department/0,3355,en_2649_34361_1_1_1_1_1,00.html
- ESPACE Project (INTERREG IIIB NWE Project) dealing with the question of how spatial planning can incorporate vital adaptations to climate change. <http://www.espace-project.org/>
- INTERREG Project Database, offering a selection of projects completed within the INTERREG III Programmes throughout Europe, that can be searched for by theme, e.g. energy: <http://www.interact-eu.net/604900/604903/0/0>
- ADAM – Adaptation and Mitigation Strategies, Supporting European Climate Policy: <http://www.adamproject.eu/>

- PRUDENCE – Prediction of Regional Scenarios and Uncertainties for Defining European Climate Change Risks and Effects: <http://prudence.dmi.dk/>
- PESETA – Impacts of climate change in Europe: <http://peseta.jrc.es/index.html>