

# ESPON SCALES Seminar in Vienna

Seminar report

04/06/2012

Commissioned by:  
ÖROK Geschäftsstelle

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## CONTENTS

1.	Background and focus	4
1.1	Thematic scope of the seminar “climate change and risk management”	4
1.2	Seminar outline and dissemination strategy	4
2.	SCALES Approach	5
2.1	Main dissemination challenges	5
2.2	Methodology: Addressing the scales problematic (CO–ZI–CO)	7
3.	Outcomes	3
3.1	Content related results (“climate change and risk management”)	3
3.2	Dissemination related results	5
3.3	Seminar participants and feedback	7
4.	Lessons learnt	9
4.1	Lessons learnt for ESPON	9
4.2	Lessons learnt for the national dissemination	10

## 1. Background and focus

### 1.1 Thematic scope of the seminar “climate change and risk management”

Climate change is a key challenge for spatial development in Europe. Several projects of the European Spatial Planning Observation Network (ESPON) therefore mention climate change with its implicated risks and challenges as issues.

Only a few projects, particularly ESPON Climate, are discussing these issues in detail and spatially explicit. In the ESPON SCALES seminar in Vienna climate change related results from selected projects – ESPON Climate and RERISK (dealing with energy poverty) – European wide results at NUTS3 scale were presented, discussed and confronted with regional climate change signals to compare the effects of scale.

Accordingly the guiding questions for the content related discussion were:

- ▶ Which aspects of climate change are discussed and relevant in the context of spatial planning and regional development?
- ▶ Which spheres (natural environment, population, housing, infrastructure, manufacturing, tourism, agriculture, forestry, energy) are considered most affected?
- ▶ What capacities regarding "mitigation" and "adaptation" are described?

Another focus of the seminar was to discuss the utility and relevance of ESPON results for spatial planning on national and regional level, in particular for Austria.

### 1.2 Seminar outline and dissemination strategy

The seminar was held on the 4<sup>th</sup> of June 2012 from 10:00 to 15:30 and followed an interactive concept. As a starting point served a thematic input by Wolfgang Loibl (AIT), an Austrian expert on climate change (CC). This was followed by a world café session where the benefit of ESPON maps related to climate change exposure, CC impact, adaptive capacity, and CC risk management were reviewed and discussed by the participants along five exemplary maps.



The afternoon session started with a fishbowl discussion: three experts on CC and CC adaptation policy with different backgrounds (researcher, practitioner and civil servant) discussed the consequences and need for action for spatial development as an instrument to adapt to climate change impacts and to carry out mitigation measures to reduce e.g. energy consumption and greenhouse gas emissions as a trigger of climate change. Complementary, inputs from representatives of the ESPON contact points from Germany, Luxembourg, Switzerland and Hungary as well as comments and questions from the audience contributed to the discussion.

A short interview with Erich Dallhammer (ÖIR) offered valuable clues of “how to read ESPON reports” in order to extract sought-after information and lead to the final programme point: The participants discussed in four different working groups their expectations regarding and European Spatial Planning Observation Network (ESPON).

The focus on climate change and risk management topics on the one hand, and utility of ESPON results on the other hand targeted civil servants, researchers and practitioners equally.



## 2. SCALES Approach

### 2.1 Main dissemination challenges

The screening of EPSON projects in this period revealed that most of all ESPON Climate (Climate Change and Territorial Effects on Regions and Local Economies in Europe) but also ReRisk (Regions at Risk of Energy Poverty) and to a lesser extent GEOSPECS (European Perspective on Specific Types of Territories) and EDORA (European Development Opportunities in Rural Areas) address the issues of climate change and risk management.

ESPON Climate<sup>1</sup> provides a pan-European vulnerability assessment, integrating the identification of regional typologies addressing climate change exposure, sensitivity, impact and vulnerability. Deriving from this assessment, the project investigates adaptation options to climate change impacts, considering the regional

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<sup>1</sup> More information on the project can be found at the following link:  
[http://www.espon.eu/main/Menu\\_Projects/Menu\\_AppliedResearch/climate.html](http://www.espon.eu/main/Menu_Projects/Menu_AppliedResearch/climate.html)

characteristics and the way policies may contribute to mitigate climate change, and to adapt to and manage those impacts of climate change that cannot be avoided.

Studies and projections on climate change based on global climate models (so called GCMs – general circulation models), using numerical models integrating fundamental physics to simulate interactions of the atmosphere, oceans and land surface. The spatial resolution is with 250x250km to 100x100km grid spacing quite coarse. Regional climate models (RCMs), nested into the GCM–Results simulate the processes for a section of the earth’s atmosphere covering e.g. a continent, with a finer resolution of typically 25x25km, 18x18km and for the Greater Alpine Region Alpine of 10x10km. Only this finer grid spacing allows to explore terrain effects, influence of land use and soil at a regional scale to some extent.

The GCMs are based on different greenhouse gas (GHG) increase scenarios following different storylines concerning economic growth, development of technologies and the energy sources used. The GCM results depend strongly on the model and equation design and the world development storyline chosen and includes uncertainties which are related to the selected numerical equations and their parameterization (e.g. for integrating effects of clouds), to the spatial resolution lacking subscale effects (e.g. terrain), and to the GHG–increase scenario (which is matter of assumptions and projections). The RCM simulations integrate GCM results in 6–hourly intervals by copying the GCM’s boundary conditions into the RCM model raster and thus inherit some of these uncertainties from the GCMs. There exist a wide range of GCMs and RCMs.

The vulnerability assessment within ESPON Climate is based on the regional climate model CLM<sup>2</sup> with 18km grid resolution, which is driven by the GCM ECHAM5 and assumes the scenario of rapid economic growth, global population that peaks in mid–century and declines thereafter, and rapid introduction of new and more efficient technologies and balanced use of the different energy sources having positive effect on future green house gas concentration increase (IPCC scenario A1B)<sup>3</sup>.

The comparison with other studies using different or several models and scenarios indicates that the mapped results of ESPON Climate are rather coarse. Following reasons are mentioned:

- ▶ Spatial reference
- ▶ Statistics
- ▶ Reference period

<sup>2</sup> For more information on the CLM model see the following link: <http://www.clm-community.eu/>

<sup>3</sup> For more information on the scenarios of the intergovernmental panel on climate change see the following link: <http://www.ipcc.ch>

A clear advantage of ESPON Climate and the European wide maps at NUTS3 level is that it provides an overview over the entire ESPON space and addressing a wide range of different topics related to climate change and adaptation. Its maps allow comparing the European regions with each other and to assess e.g. the own regions position in terms of exposure or adaptive capacity (keeping in mind the caveats mentioned before).

## 2.2 Methodology: Addressing the scales problematic (CO-ZI-CO)

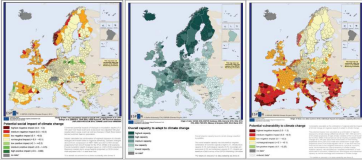
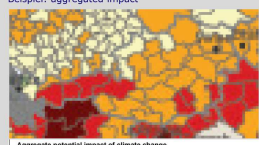
In terms of the Co-Zi-Co strategy climate issues seem to benefit particularly from the comparison and the completion approach. These mean strategies that on the one hand compare the status of Austrian regions with those of other countries in similar situation and on the other hand complete the generalized, European data with more detailed and regional data. In contrast, the zooming-in approach does not provide sufficient results when dealing with the regional scale.

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**Table 1: Dissemination challenges of ESPON results**

<i>Main dissemination challenges</i>	<i>“CoZiCo tools”</i>	<i>Example</i>
<p><b>Spatial reference</b></p> <p>ESPON Climate maps use territorial units according to NUTS3. This implies all challenges connected with NUTS standard e.g. differences in size between the different NUTS (e.g. SE-Övre Norrland and DE-Trier) but also a spatial classification aside from climate relevant topics (e.g. climate zones)</p>	<ul style="list-style-type: none"> <li>▶ Compare: ESPON maps enable to compare the situation within Europe with regard to sensitivities, impacts, adaptive and mitigation capacities</li> <li>▶ Zoom-in: Results for Austria’s regions are not always plausible</li> <li>▶ Completion: delineation of entities focussing on the topic illustrated in the maps could produce more useful results.</li> </ul>	<p>Comparable climate change impacts, adaption capacity and vulnerability in Europe (left) &amp; the details for Austrian regions (right)</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="1234 608 1621 884"> <p>Impacts, adaptation capacity, vulnerability</p>  </div> <div data-bbox="1648 608 2029 884"> <p>Regionale Ergebnisse nutzbar für Österreich?</p> <p>Beispiel: aggregated impact</p>  <p><b>Aggregate potential impact of climate change</b></p> <ul style="list-style-type: none"> <li>High negative impact (0.5 - 1.0)</li> <li>Medium negative impact (0.2 - 0.5)</li> <li>Low negative impact (0 - 0.2)</li> <li>Low positive impact (0.1 - 0.2)</li> <li>no data</li> <li>no data</li> </ul> </div> </div>



		<p>presenting seasonal results, results covering the time range 1961 to 2050 and results from a set of regional climate simulations from different GCM-RCM-GHG increase-scenario combinations according to climate regions.</p>
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## 3. Outcomes

### 3.1 Content related results (“climate change and risk management”)

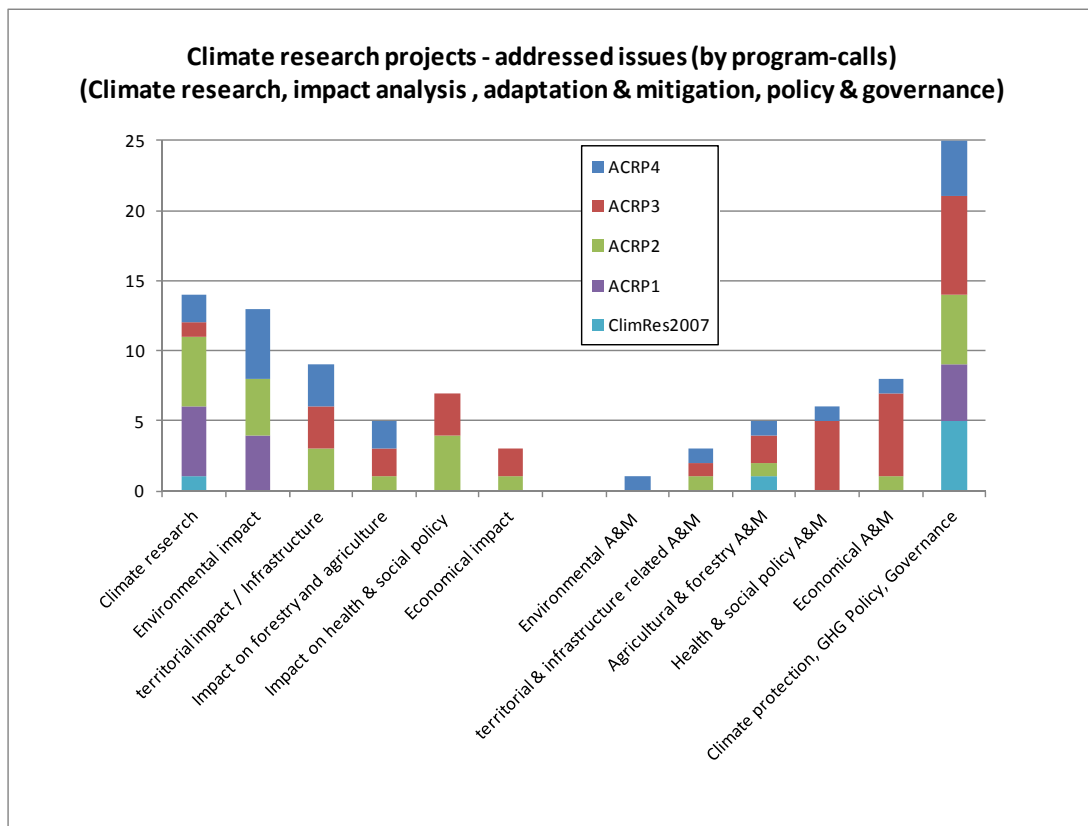
- ▶ What are the major issues when discussing climate change and risk management and what are the particularities of the situation in Austria

In global terms climate change is the most important eco-political topic. Changes in climate and its impacts are already visible and likely to become more pronounced in the future. Still, the international discussion is slow and too little and the implementation of action takes time. Action in this regard has to be understood twofold: Firstly, the mitigation of climate change, often synonymous with the reduction of greenhouse gas (GHG) emissions. Even if good progress is made in that regard, climate change to some extent has become unavoidable. This leads to the second form of necessary action, the adaptation measures to address climate change impacts. It should be stressed here, that implementing measures combating climate change do not imply an economic disadvantage. In a global assessment of the cost-benefit analysis Nicholas Stern<sup>5</sup> points out that measures directed against climate change always pay off, because the damage costs are 10 times higher than adaptation or mitigation measures.

In Austria climate change impacts will be very variable due to the fact that some parts are densely populated and others are covered by the Alps that separate the mountainous regions from the Mediterranean space. In the Alps the tourism and biodiversity will be affected most profoundly i.e. decreasing snow cover, melting glaciers, tree line shift, changing species composition. In the Alpine Foothills, the Pannonian Plain, Klagenfurter and Grazer Basin effects are expected mainly on forestry and water.

Within the Climate and Energy Fund framework, the Austrian Climate Research Programme (ACRP) provides a conceptual and institutional framework for supporting climate research in Austria. So far research focused primarily on energy efficiency and GHG reduction. This holds true even for those calls which name governance and climate protection as their key issue. Although some studies investigate mitigation and adaptation measures, hardly any research on climate change impacts was commissioned by an official body.

**Figure 1: Issues addressed by the four calls on Austrian climate research (~80 projects)**



Source: OIR 2012, own survey

- ▶ Which aspects of climate change are discussed and relevant in the context of spatial planning and regional development?

After several years of intensive debate the draft of the non-binding national adaptation strategy is now available in Austria. So far, Austria shows a high level of adaptive capacities in the disaster management as well as agriculture and forestry while the tourism sector is lagging behind. In order to address this issue, experts bank on adapted regional funding and spatial planning that has the reduction of emissions in focus. Although spatial planning and its instruments are seen as major leverage to combat climate change, it has to be kept in mind that it is only one player among others who mostly represent short-term economic and political interests. This is aggravated by the fact that spatial planning itself pursues contradicting goals: enhancing or sustaining a certain level of quality of life in the city (e.g. through green and open space) versus high-density housing developments in order to spare natural resources in a compact city.

Having focused on Austria it has to be noted that climate change is a global phenomenon and does not stop at administrative boundaries. It takes a problem-

oriented analysis of its effects considering the affected areas, actors and sectors. In that regard supraregional or transnational initiatives are in demand. Impacts on the alpine region for example are simulated with one common model that integrates alpine space in Austria, Italy and Switzerland. The exchange of data or best practices (e.g. dealing with forest fires, or winter tourism in regions where days with snow cover are decreasing) is another example of vital cooperation. The macro-level, such as the EU, is an important knowledge hub that can promote the collecting of comparable data and support nation states by the formulation of their mitigation and adaptation strategy.

### 3.2 Dissemination related results

- ▶ What practical benefits and what added value can ESPON results offer the Austrian professional planning community?

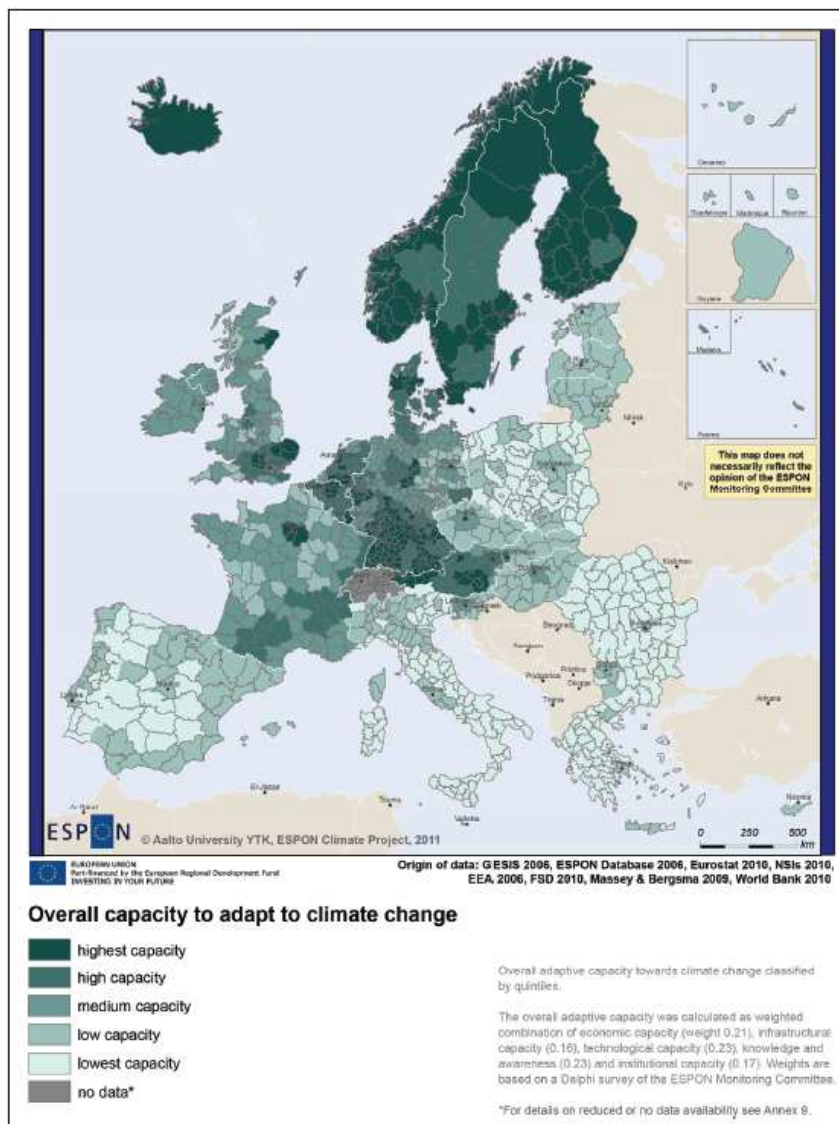
ESPON uses a scientific approach, which is clearly reflected by the complex definitions, indicators and models presented in the deliverables. Thus it requires intense examination by skilled users to comprehend maps and reports. Other sources like Eurostat are used more frequently in order to produce simpler maps or access data.

The world café method was used for a hands-on discussion on the practicability of ESPON maps. Participants of the seminar could discuss exemplary maps in groups and add ideas for the content or the dissemination method.

As the world café session at the seminar revealed, the complexity of the maps and the underlying data often impedes the understanding of the maps. Many times it is not obvious how the components of the often aggregated indicators have been weighted and to which extent an indicator itself contributes to a greater typology.

Not only the indicators necessitate more explanation but also the definitions, which have been used. For instance the following map “Overall capacity to adapt to climate change” from the ESPON Climate project<sup>6</sup> caused significant problems in understanding due to the intransparent definition of “adaptive capacity” as well as the high level of aggregated information. Hence the lack of information needs to be either compensated by another way of presentation or by a concise but reasonable explanation in the report or map.

Figure 2: Overall capacity to adapt to climate change



Source: ESPON/IRPUD TU Dortmund 2011

As already mentioned above (cf. 2.1), a major strength of ESPON results is the provided overview of the ESPON space. Thus it allows comparison on a larger scale and embedding of a national situation in a greater context. Nevertheless difficulties are arising from the zooming in into national conditions, which is why country-specific interregional comparison rather problematic. At its bottom this is what can be called the “problem of indicators and scales” inherent to ESPON results: This refers to the fact that most often there is a lack of comparable and harmonised data on a European scale – especially on NUTS3 level. Usually data is only available for NUTS2 units, which leads to a rough picture in Austria concerning small scale specificities. In the world café session participants even mentioned, that the map “Regional Typologies of Energy Poverty” from the ESPON ReRisk project<sup>7</sup> visualises a quite implausible picture of the Austrian situation and that it does not meet the



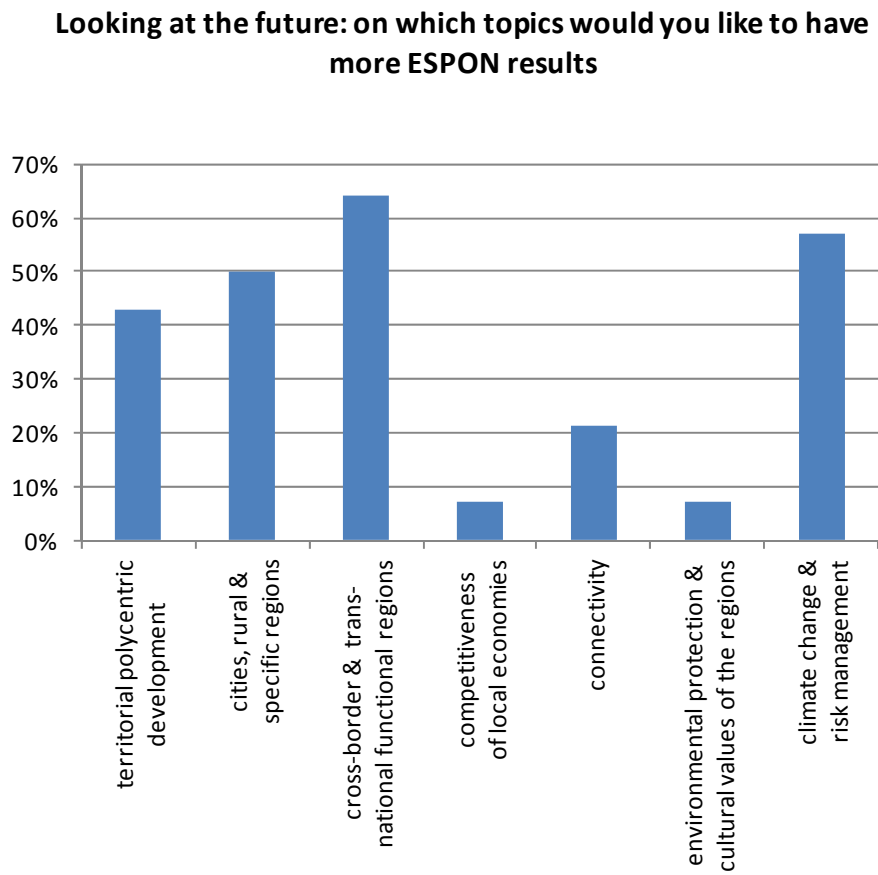
expectations. Hence some regional phenomena cannot be correctly depicted, if one draws on available comparable national data or makes use of mean values, which tend to level out regional disparities.

Furthermore the attending civil servants, researchers and practitioners objected to some more general issues of graphic presentation of the selected maps from ESPON projects. For example, class limits or the scaling were perceived as obscure and hard to interpret. Furthermore, it will be sometimes of avail if the baseline situation and/or the relative development are additionally displayed. Exact denominations of maps including the concrete time frame as well as adequate colours were mentioned as helpful to make the interpretation of maps easier.

### 3.3 Seminar participants and feedback

The participants were asked to answer a feedback survey. Of the 36 participants 14 returned a filled-in questionnaire. According to its evaluation 43% of the participants were researchers, civil servants and practitioners made up 21% each and the remaining attendants had other functions. Two thirds regard publications as the most useful form of ESPON presentations followed by seminars and workshops. From the publications, half of the respondents consider maps as the most useful form of deliverable, although analysis in reports, databases, scenarios and policy recommendations are also mentioned by roughly 30% each. Affirmative is the result, that more than half (57%) of the participants have used ESPON results before and another 29% plan to do so. For the future of the ESPON programme, the attendants expressed interest in the topics of cross-border and transnational functional regions followed by climate change and risk management as well as cities, rural and specific regions (for more detail see diagram below)

Figure 3: Desired future ESPON topics



Source: OIR 2012, own survey

## 4. Lessons learnt

### 4.1 Lessons learnt for ESPON

One characteristic of ESPON projects is their scientific approach. Notwithstanding, this causes sometimes troubles in interpreting maps as definitions, indicators and typologies are rather complex. Referring to the elaboration in the previous chapter, the provision of further information is regarded as fundamentally necessary: How indicators are calculated; why they have been used in that particular way or how plausible the depicted situations are. Therefore access to data sources and values underlying the combined indicators as well as proof of the uncertainty level need to be provided. On the long run, the creation of a central well-maintained database may be an aim.

Dependent on the extent of the explanation required, in traditional maps this can be provided either by a concise text next to the legend or by a supplement-sheet. This could also be complemented by web links in order to be able to go into even more detail, if desired. Moreover, more dynamic user-orientated means of presentation can be applied. For example a web GIS tool which allows the user to individually choose the thematic scope of the displayed map. For more advanced users, sophisticated applications like the variation of class limitations or weights of combined indicators could be also possible. An offline alternative may be a dynamic pdf-document integrated in the respective project report.

In order to avoid overwhelming complexity, the concentration on clear-cut issues with a shorter time horizon may be an opportunity. The subdivision into several temporal phases makes it easier to grasp longer periods and thus to identify, at what point of time (political) action is most essential.

ESPON deliverables provide a greater picture of the ESPON space, illustrating the European perspective in which the national situation can be placed. In this sense, comparison of different countries is possible and reasonable. For making the results more useful in the national and the regional context, they are in need of conversion and, literally meant, translation, wherefore adequate resources within the realm of a project need to be estimated. Thus the scientific approach has to be broken down on the actual level of planning in order to make use of the results in daily practice.

## 4.2 Lessons learnt for the national dissemination

Whereas ESPON itself procures the internationally orientated dissemination activities, the numerous ESPON Contact Points (ECPs) are responsible for the ones on the national level tailored to the target groups. However, the latter needs to be further specified, if for example the administrative body, planners, policy advisors or the interested public are primarily addressed. Similar issues apply to ESPON results. As the Austrian seminar showed, there is a great uncertainty, whether the results serve as a foundation for concrete policy advice or, on the contrary, shall be limited to the depiction of mere basic information. If the first one applies, the actual addressees can only be located on an EU-level, for example policy makers deciding on development funding. For policies on the national or regional level ESPON results appear to be too coarse and too highly aggregated. On this scale the outcomes need to be complemented by additional (national) data.

In terms of the Scales approach, other reference categories apart from the existing statistical entities shall be elaborated. This particularly applies to cross-cutting topics like climate change. Right this phenomenon is neither limited to national nor regional boundaries and thus necessitates other levels of analysis, where quite similar basic conditions prevail and comparable impacts are to be expected, like for instance the climate change topic in the Alpine Region.