

**European Climate Change Programme**

**Working Group II  
Impacts and Adaptation**

**Regional Planning, Energy and Public  
Infrastructure and Structural Funds  
Sectoral Report**



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## **The EU's Adaptation Programme**

Adaptation is a new policy area for the European Climate Change Policy. The Impacts and Adaptation Workgroup has been set up as part of European Climate Change Programme (ECCP II). The main objective of the workgroup is to explore options to improve Europe's resilience to Climate Change Impacts, to encourage the integration of climate change adaptation into other policy areas at the European, national and regional level and to define the role of EU-wide policies complementing action by Member States.

The aim of this initial programme of work is to identify good practice in the development of adaptation policy and foster learning from different sectoral experiences and explore a possible EU role in adaptation policies.

The Commission has led a series of 10 sectoral meetings looking at adaptation issues for different sectors. One of these meetings looked at regional planning, energy and public infrastructure in particular. This report summarises the state of play in these topic areas in relation to adaptation to climate change on the basis of the information gathered at the stakeholder meeting.

## **Key Impacts of Climate change in Europe**

### *Regions*

The expected impacts of climate change across Europe in general can be disaggregated further to highlight impacts in specific regions of Europe. These regions can relate to geographical boundaries, such as a river basin, a part of the coastline or a sea (the Danube, the Baltic Sea, etc.) that cross Member State borders. These regions can also relate to politically-delineated regions within Member States such as the different Leander in Germany. Some of these regions lie fully within the EU, and others are only partially within EU borders.

The variations between the impacts expected in different regions across various sectors at the social, economic and environmental level are influenced by a number of factors, including:

- the climate of the region,
- the geography and geological conditions of the region,
- natural habitats and eco-systems of the region,
- existing land-use including built-up areas, infrastructure and agricultural use across the region,
- the vulnerability of the region, as indicated by social organization and economic structure,
- cultural practices, awareness and behaviours,
- the political strength of the governance structures of that region (be it international or sub-national).

The impact of climate change on the tourism industry is a good example of a sector where the impacts will vary greatly in different regions. Here the scale of the economic impact, positive or negative, is highly related to the nature and scale of the predicted climatic changes, as well as the profile of tourism in that region. Risks to the Alpine region may become increased with altered snowfall in the winter, particularly in winter sport resorts on the lower altitudes. The Mediterranean region will become an undesirable destination for tourists during the traditional holiday

season because of high temperatures, whereas more northerly European coastlines might become a more attractive alternative holiday destination.

### *Regional and Spatial Planning*

Within a given region, the impacts of climate change can vary depending on land-use decisions, land management practices and the use of existing resources.

Land-use decisions and land management practices are largely the result of planning systems and processes. Therefore, decisions about how to use land in the long-term should take climate change into account in order to ensure that impacts and conflicts are minimised and opportunities capitalised upon.

Spatial planning takes place at the local, regional and national levels, with international and cross-border relationships also of potential importance. However, the structures and processes in place in different countries differ greatly.

### *Infrastructure*

Climate change impacts on public infrastructure relate to a range of factors and include the age of the existing infrastructure, as well as the design life of both existing and future structures. Flooding, erosion and related stability problems in watercourse and coastal areas, water availability, increased UV and heat exposure would all represent risks to existing infrastructure.

This report tackles energy infrastructure in particular. In terms of energy infrastructure, climate changes can affect, amongst other things:

- building design,
- safety elements and considerations,
- the availability of types of power e.g. hydro, wind,
- the ability to operate certain plants e.g. nuclear plants due to limited cooling,
- the availability and safety of water power plants and related dams,
- the demand for power (e.g. a French study revealed that a 1°C temperature drop can cause a demand increase of 1000MW for a power plant, noting that the running of power plants is very climate sensitive).

In combination, these factors could lead to disruption to the usual supply of electricity, affecting different groups and organizations in accordance with their vulnerability.

There are a variety of adaptation actions that could be taken in the energy sector including:

- making installations less sensitive to air and water temperature,
- making the transport and distribution networks less sensitive to wind,
- enabling contract possibilities with large industrial clients to encourage them diminish their energy consumption during a crisis in order to meet demand elsewhere.

### **Existing/Relevant policies at the EU level**

One of the EU's clearest roles in relation to adaptation to climate change will involve using the current policies and measures that exist at the EU-level to their fullest potential and integrate climate change adaptation options into their respective implementation.

There are a range of EU policies that influence planning decisions at the national, regional and local levels. Listed below are those of relevance to the processes relating to regional planning:

- Natura 2000 network,
- Water Framework Directive – which has a powerful potential but currently does not reflect flash floods, cities, nor integrated spatial planning concerns,
- Floods Directive,
- Soil Thematic Strategy/Directive (proposal),
- INSPIRE Directive (proposal),
- Integrated Coastal Zone Management (ICZM) recommendation,
- European Landscape Convention<sup>1</sup>,
- rural development plans,
- the European Spatial Development Perspective (ESDP), which is, to some extent, being followed up through current work upon territorial issues in the so-called Rotterdam Process which aims to include territorial aspects in EU policies,
- the related European Spatial Observation Network (ESPON),
- the Birds and Habitats Directives which needs a more clearly stated approach for the future in relation to adaptation,
- Common Agricultural Policy (CAP),
- Strategic Environmental Assessments,
- structural funds,
- EU Thematic Strategy on Urban Environment.

European Spatial Plan Observation Network (ESPON) has the objective of carrying out applied research and studies on territorial development and spatial planning seen from a European perspective in support of policy development. This exercise maps Europe from many perspectives and can be used in the context of adaptation to climate change.

#### *Structural Funds*

The EU's structural funds have the power to influence investment decisions in eligible regions. This funding is available for cross-border projects and in particularly deprived parts of Europe. The structural fund could be used in relation to adaptation in two key ways:

- to fund climate change adaptation-related policies and initiatives,
- to ensure that other investments take climate change into consideration, thus ensuring that EU structural funds are spent on climate change resilient projects.

The Regulations for the Structural funds are currently being updated and prepared for approval by all of the Commission departments. There will be strategic guidelines, adopted by the Council, as well as the regulations, that are intended to be a more political document. This guidance includes reference to risk preventions, which could be used to cover climate change, although it does not make any clear and direct reference to climate change adaptation.

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<sup>1</sup> <http://conventions.coe.int/Treaty/en/Treaties/Html/176.htm>.

A map of different natural risk hazards is included in the regulations and strategic document and could be used to indicate the areas where climate change could be tackled.

### **Examples of existing initiatives at regional and Member State level**

#### *Regional-level initiatives*

The degree to which member states have interacted with climate change at the regional level varies. The level of engagement relates to a number of factors including the governmental structure within that country itself and the relative strengths of the different levels of government. This is also closely related to the country's overall level of engagement with the issue of adaptation to climate change, which is not consistent throughout European Member States. Some of these regional initiatives have been co-ordinated by cross-border groups.

Several examples of existing initiatives are given below:

1. Conference of Peripheral Maritime Regions in Europe (CPMR), an international group of regions.

Some marine regions are taking action under the auspices of this overarching group, which has sent a questionnaire to its members on their work in this area. Some of the areas where regions are taking action involve:

- drafting strategies, policies, plans and programmes,
- raising awareness,
- establishing regional partnerships,
- launching research partnerships,
- identifying priority projects.

However, although some of these regions (approximately 25 across Europe) are taking actions already, an equally large number would be interested in further guidance on how to proceed.

2. The Arctic Council co-ordinates the work of the Arctic Monitoring and Assessment Programme (AMAP), an international programme designed to consider matters relating to threats to the Arctic region from pollution, and associated issues. The AMAP, jointly with the CAFF (Conservation of Arctic Flora and Fauna) is also responsible for the Arctic Climate Impact Assessment, set up to carry out a comprehensive assessment of climate impacts on the Arctic region.

The findings from the assessments have been used to inform governments and recommendations on adaptation strategies were made to address the sensitive and vulnerable natural and human systems of the region.

3. Three adaptation projects have taken place in the Baltic Sea region covering an area stretching over several Baltic and new EU Member States:
  - SEAREG focused on how sea level changes would affect spatial development in the region,
  - ASTRA is the (ongoing) follow-on from this project focusing on raising awareness of climate change impacts and adaptation issues and

identifying policy options. (both ASTRA and SEAREG were funded by the EU initiative INTERREG III B),

- FINADAPT was a smaller project funded by the Finnish government focusing on several areas for adaptation activity, including planning and the potential barriers to adaptation measures in this area.
4. The Spanish national government is currently coordinating a programme to evaluate the impacts of climate change in Spain, and the need for adaptation. This work is also being carried out down to the level of regions. The region of Andalucía, in particular, has recently made public its Andalucía Climate Change Action Plan.
  5. In the UK an assessment of the impacts of climate change has been carried out at the regional level. In many cases this work was followed by the setting up of an independent partnership that has taken forward the work of adaptation to climate change. Examples include the South East Climate Change Partnership and the South West Climate Change Impacts Partnership.

### *Spatial Planning*

1. The ESPACE project (European Spatial Planning: Adapting to Climate Events), funded by the EU INTERREG programme, addresses spatial planning issues directly. This programme focuses on water measures in particular but its overall aim is to ensure that adaptation is recognized as an issue in spatial planning. The outputs of this piece of work include a set of adaptation strategies and policy guidance.

As part of this project, a wider partnership group has been established across Europe in order to share experiences and ensure that the results of the project have wider relevance.

2. The South East Climate Change Partnership in the UK has worked on the integration of climate change considerations into planning documents for the region. This work has focused on a climate change policy cross-cutting theme within the region's spatial plan. This involved a high degree of stakeholder engagement and has resulted in the development of planning guidelines, amongst other outputs.
3. The UK's Three Regions group on climate change (including the South East, East of England and London) has developed a checklist for developers (entitled "Adapting to Climate Change: A Checklist for Development") taking them from the acquisition of the site through to the development of a building and its maintenance, highlighting the key climate change considerations at each stage.
4. Multi-functional floodplain management in the Tisza river basin is an example of a project undertaken at a local level to find climate change adaptation solutions. This project was holistic in its approach, addressing social, economic and environmental issues associated with flooding risk in the river-basin area.

This project can be seen as an example of land-use and spatial planning decision-making as approached in a stakeholder-lead manner. Decisions about changing land-uses to cope with flooding, and to recognise the most

appropriate use of the land in the future were addressed over the course of the project.

5. The Baltic Sea region projects SEAREG, ASTRA and FINADAPT (see above) have a clear spatial planning focus.

#### *Infrastructure*

1. The main French electricity provider, EDF, has set up a permanent group which wrote and monitors its Climatic Hazard Strategy. Recent high-profile extreme weather events, such as the 2002 floods and the 2003 heat wave, stimulated the creation of the group. The priorities of the strategy are to ensure the safety of people and goods, and then guarantee the security of supply in space and time. This strategy has three main axes: preparation, anticipation and communication. EDF also ensures that it has sufficient crisis management preparedness in place. Some of the stimuli for this activity come from EDF's public service obligations. Additionally, work on climate change adaptation at EDF has also stimulated some new R&D perspectives.

### **Gaps identified**

#### *Working at the Regional (sub-national) level*

The regional level faces the challenge of translating the aspirational and visionary goals of a government into concrete, detailed actions. In some countries, this linkage has not been made clearly and effectively thus far. However, in other countries such as Sweden, a well-established transparency process contained within the country's legislation clearly states responsibilities for this level of governance.

#### *Spatial Planning*

Spatial planning in general, and regional planning in particular, are set out in differing structures. Often, municipal and/or state planning powers are much stronger than the regional ones, although power structures vary depending on differences between the Member States.

In addition, mainstreaming of adaptation issues into spatial planning remains a challenge, particularly with regards to the following:

- tackling short-term thinking by politicians, versus the long-term thinking required in relation to adaptation,
- providing a stronger link between sectors, such as water management, planning and adaptation to climate change, potentially through EU Directives (e.g. Water Framework Directive),
- providing clearer guidance to policy-makers about the correct, or recommended problems to address and actions to take,
- clarifying the relationship of adaptation to other planning goals, to prevent it from being overshadowed,
- increasing the emphasis in planners' training on climate, e.g. on hydrology and risk of natural hazards.

#### *Structural Funds*

The Guidance documents for these funds need to address climate change adaptation directly, including the related impacts, risk, vulnerability and appropriate adaptation measures.

Currently the Structural Funds' mechanisms do not have a clear mechanism for taking climate change adaptation issues on board in order to both fund new adaptation projects and "climate proof" others. This gap could be filled when the mid-term strategic guidelines for the Structural Funds will be renegotiated in 2009. Structural Funds should only finance projects which have carried out a comprehensive Climate Change Risk Assessment at the planning stage. Climate Change, and particularly adaptation measures represent an economic opportunity for European regions and businesses as new innovative technologies are being developed, being in the field of water management, flood defence, construction, etc.

### **Opportunities for the EU level**

Spatial planning and investment decisions take place at the national, regional and local levels. Therefore, in this agenda, the subsidiarity principle is of the essence. However, the EU still has a powerful role to play in setting the overall agenda and providing broad guidelines in relation to regional planning and climate change adaptation, as well as in assisting with funding, research and tools in certain instances.

To this end, the EU's role should be to continue to support and encourage regional planning and investments across Europe, whilst using its influence to support robust planning decisions for the long-term, which take climate risks into consideration.

The European Spatial Dimension work<sup>2</sup> is a good model for an approach whereby the EU does not create any new policies but does provide an overall vision of spatial planning and sustainable development across Europe. The ESDP currently does not address climate change; this omission should be remedied. One approach could be to use the current intergovernmental Rotterdam process where the stronger inclusion of territorial aspects into European policy-making is highlighted.

A key role for the EU is to isolate its existing policies which influence planning decisions and investments and work to ensure that these integrate climate change adaptation issues sufficiently. The EU also needs to ensure effective integration of policies, so that recommendations and actions are complementary.

The second major area of responsibility for the EU in spatial planning is to provide leadership in areas that cross EU borders (i.e. to non-EU countries and regions that may be adjacent to the EU) to ensure a continuity of approach.

The EU can provide valuable support in terms of information and management (see list below). The provision of information and tools could be carried out through a structure similar to that of UKCIP (UK Climate Impacts Programme). Alternatively, the EU could consider supporting the setting up of UKCIP-like bodies in various member states.

UKCIP is part of the UK's approach to climate change policy overall. It has a mission to help organisations assess how they might be affected by climate change so that they are better-equipped to take well-informed decisions by providing tools and resources to support adaptation to climate change impacts.

In general, the tools devised by UKCIP can be characterised as technical reports authored by experts. Several reports have already been developed and rolled-out,

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<sup>2</sup> ESDP European Spatial Development Perspective: Towards balanced and sustainable development of the territory of the European Union, the European Commission, Potsdam 1999.

however, these have generally been designed for the sophisticated end of the stakeholder groups. The current challenge for UKCIP is to translate these documents into more focused reports in order to appeal to the full range of stakeholders.

The existing tools and publications include climate change scenarios, socio-economic scenarios, the adaptation wizard, a risk management tool, costing tool, adaptation case studies, business impacts tool and a local communities' tool.

In the area of energy infrastructure, the EU should also take a broad role, supporting Member States. Several key European policies have influenced the ownership structures of the utilities, which in turn influences the way in which the adaptation agenda is approached. The EU could play an important role in investigating the way in which EU policies affect the resilience of energy infrastructure including, for example, market liberalization and the changed roles of regulators.

Many specific actions for the EU have been identified covering the topics of regional activities, spatial planning and energy infrastructure. These are set out in four headings below.

#### *Information and Knowledge*

- a) linked European research programmes and databases are important in providing information to regional planners (e.g. the framework research programmes, ESPON). The EU should focus further adaptation research on the following topics, with consideration to the existing directives on flooding, soil protection, water, etc, in order to support regional planning:
  - regional climate scenarios and projections,
  - regularly updated risk maps as a planning tool for regional planning work,
  - risk and vulnerability assessments for regions,
  - assessment of the impacts of climate change on regional competitiveness and territorial cohesion including an assessment of the costs of inaction,
  - cost calculation of potential adaptation measures,
- b) the EU should help disseminate information on different adaptation actions that can and have been taken in relation to spatial planning e.g. how to incentivise the risk management and adaptation in land-use planning rather than disincentivise by public compensation of damages,
- c) the EU should launch a campaign for public awareness on the need to adapt at the same time as publishing the Green Paper focused on local and regional decision makers,
- d) the EU should consider whether/how it could represent a gathering (focal) point of information (e.g. information regarding climate change scenarios) but in particular also monitor on-going adaptation activities in the Member States to highlight best practice in order to inform and lobby the planning decisions and processes of national, regional and local government. This focal point could be organised as a special EU-level climate information body,
- e) the EU has a role in spreading information and providing support both for policy-makers in the spatial development sphere, and planners in particular,
- f) the EU should lead on the development of risk-based planning instruments to lend concrete support to the recommendations being made to policy-makers and planners,
- g) the EU also has a role to play in spreading information on the opportunities available to the energy sector,

### *Planning Process for Policy*

- h) the EU should consider approaching the adaptation agenda with a mix of straightforward policy principles and examples of good practice, along the lines of the European Spatial Development Perspective<sup>3</sup>,
- i) the EU could consider bringing forward a directive or recommendation to make climate change considerations compulsory in national and regional planning and development schemes. Such a directive/recommendation would ensure appropriate integration of climate change impacts should be made an obligatory standard requirement in regional development,
- j) the EU should highlight, during the policy planning process, the impacts of climate change on regional competitiveness and territorial cohesion,
- k) the EU should drive a more holistic approach to the planning process (also an urban issue), for many Brownfield sites are located in areas of higher climate risk (e.g. flood and coastal erosion risks),
- l) the EU should engage with adaptation activities that cross EU borders such as the work of the Arctic Council,
- m) the EU might have a role in developing an understanding of what quality has to be maintained in the energy supply system overall, and therefore the level of resilience and contingencies that member states and the private sector should work towards,

### *Economic instruments*

- n) the EU has a role in funding adaptation studies or activities that cross the borders of EU countries but may be in the same geographical region such as the ESPACE project,
- o) funding mechanisms in Europe need to be devised in a way that take into account the complexity of the objectives involved in planning adaptation projects. Current European funding structures, via the structural funds, do not successfully evaluate projects for these criteria,
- p) the EU needs to isolate perverse funding incentives that currently influence land-use and land management in a manner that does not support climate change adaptation,
- q) EU funds could be set up to directly support areas of assistance to regional planning such as risk mapping and anticipation of disasters through to direct actions to adapt to climate change,
- r) Community funds are already used to fund preventative measures in some cases but not in proportion to the scale of the climatic challenges. This funding should be complementary to national funds, e.g. for natural hazards. The EU should carry out a prioritisation exercise in terms of preventative measures,

### *Risk and Disaster Management*

- s) the EU can support regions in their preparedness by providing more research and information in relation to vulnerability to extreme events, as well as to gradual climate changes. Vulnerability will relate to social circumstances, as well as infrastructure such as insurance mechanisms,
- t) existing EU tools will also help support planners and regional governments in the case of disasters, for example by providing GIS data and tools for risk assessment and management like EFAS,

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<sup>3</sup> **European Spatial Development Perspective (ESDP)**, drawn up by the Member States in co-operation with the European Commission is a (legally non-binding) policy document that includes clear spatially development guidelines to balance the spatial development in the EU.

- u) the EU can provide help with remote sensing data on impacts and damages and urgent needs in case of disasters (GMES).

### **Actions relevant at national, regional and local level**

#### *National Level*

Spatial planning and regional planning is primarily co-ordinated at the national level. There is great variety in the planning structures and processes across the different Member States and therefore it is the responsibility of these national governments to provide the vision and overall guidance to their planners at all levels, of how to incorporate adaptation to climate change into their approaches.

The particular responsibilities of National governments are listed below:

- a) to ensure that planning decisions at the national level incorporate climate change considerations and do not exacerbate vulnerabilities in particular regions or localities,
- b) to provide support to regional planners where decisions have to be made that balance several priorities, maybe leading to a high climate risk option (e.g. building on a flood plain),
- c) to consider the most appropriate division of responsibility between the public and private sectors, e.g. insurance in new development areas,
- d) to identify national policy levers or barriers that could or should be changed to facilitate climate change adaptation through the regional planning process e.g. standards on water efficiency in new buildings. It may be appropriate for some such standards to be differentiated by region within a country where impacts of climate change are likely to be considerably different, but where legislation sits at a national level,
- e) to require and to support cross-regional dialogue within the country where planning processes cross political boundaries but adaptation issues are continuous, such as in the case of river basins and coastal areas,
- f) to ensure that planning processes at all levels of government, national, regional and local are sufficiently co-ordinated, such that climate change considerations and adaptation are treated similarly at all levels on a range of issues e.g. flood mapping,
- g) to communicate clearly to all levels of government the importance of considering climate change adaptation in spatial planning activities at all levels,
- h) to provide guidance, through EU mechanisms and independently via information provision, tools and best practice examples from within the country and from abroad.

#### *Regional (Sub-national) Level*

The role of the regional level in the planning agenda is dependent on the planning structures within different Member States. However, overall, the regional level is central in making most planning decisions on the ground, and in incorporating the local level circumstances into the high-level visions and making the relevant practical decisions.

It is the responsibility of the regional level of planning to incorporate the regional economic, geographic and infrastructural considerations into decision-making processes, including a regional understanding of climate change impacts. In most of these areas the EU and national levels of government will provide valuable high-level support and guidance.

Regional governments have a key role in identifying and developing the appropriate relationships with stakeholders in relation to planning and adaptation to climate change. Such stakeholders would include those who provide infrastructure to new development areas, as well as developers, planners and other bodies.

#### *Local level*

Many small-scale planning decisions are made at the local level (see also the urban report) therefore there is a role for local level governments in ensuring that planners involved in the final decision-making process understand adaptation issues and how to incorporate these into the wide range of other planning priorities that they face.

In some countries, for example Sweden, the local administration or municipality has the right and obligation to be responsible for the land use planning. This is stated by the Swedish Planning and Building Act. The regional authority has a role to review some aspects such as health and safety including risks of climate change.

There is also a role for bottom-up actions to take place in relation to climate change adaptation, lead by local groups which could involve existing stakeholder bodies coordinated by local governments. These local level actions usually have strong stakeholder support and are good mechanisms for making full use of local skills.

#### **Further References and Weblinks**

'From Benidorm to Brancaster: Climate change and its impacts on tourism'; Dr. David Viner, University of East Anglia, Journal of Sustainable Tourism, 2006

Arctic Climate Impact Assessment, Arctic Monitoring and Assessment Programme  
[www.amap.no](http://www.amap.no)

Studies undertaken in the Baltic region:

SEAREG <http://www.gtk.fi/projects/seareg/>

ASTRA <http://www.astra-project.org/cms/>

FINADAPT <http://www.ymparisto.fi/default.asp?contentid=56105&lan=EN>

Work Taking place in Spain on Climate Change Adaptation (including regional research)

[http://www.mma.es/portal/secciones/cambio\\_climatico/documentacion\\_cc/historicos\\_cc/en\\_impactos2.htm](http://www.mma.es/portal/secciones/cambio_climatico/documentacion_cc/historicos_cc/en_impactos2.htm)

Adapting to Climate Change – Lessons For London, London Climate Change Partnership, July 2006. This study includes case studies from around the world of adaptation to climate change in cities.

<http://www.london.gov.uk/climatechangepartnership/docs/adapting-climate-change-london.pdf>

The UK's Department for the Environment, Food and Rural Affairs (DEFRA) is finalizing a study on land use planning in relation to climate change due out in the autumn. [www.defra.gov.uk](http://www.defra.gov.uk)

Projects in the Tisza River Basin:

[www.bokartisz.hu](http://www.bokartisz.hu)

[www.elotisza.hu](http://www.elotisza.hu)

[www.vati.hu](http://www.vati.hu)

[www.farland.eu](http://www.farland.eu)

European Spatial Plan Observation Network (ESPON) [www.espon.eu](http://www.espon.eu)

European Spatial Planning: Adapting to Climate Events (ESPACE)  
[www.espace-project.org](http://www.espace-project.org)

Conference of Peripheral Maritime Regions in Europe  
[www.crpm.org](http://www.crpm.org)

EEA's (European Environment Agency) Environmental policy integration in Europe: state of play and an evaluation framework, EEA Technical Report No. 2/2005, 2005, Copenhagen, <http://www.eea.europa.eu/>

EEA's (European Environment Agency) *Vulnerability and adaptation to climate change report*, EEA Technical Report 7/2005, <http://www.eea.europa.eu/>