



Climate change mitigation and adaptation in strategic environmental assessment

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ABSTRACT

Countries are implementing CO₂ emission reduction targets in order to meet a globally agreed global warming limit of +2 °C. However, it was hypothesised that these national reduction targets are not translated to regional or state level planning, and are not considered through Strategic Environmental Assessment (SEA) in order to meet emission reduction obligations falling on the transport, energy, housing, agriculture, and forestry sectors. SEAs of land use plans in the German state of Saxony, and the English region of the East of England were examined for their consideration of climate change impacts based on a set of criteria drawn from the literature. It was found that SEAs in both cases failed to consider climate change impacts at scales larger than the boundary of the spatial plan, and that CO₂ reduction targets were not considered. This suggests a need for more clarity in the legal obligations for climate change consideration within the text of the SEA Directive, a requirement for monitoring of carbon emissions, a need for methodological guidance to devolve global climate change targets down to regional and local levels, and a need for guidance on properly implementing climate change protection in SEA.

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1. Introduction

The Copenhagen World Climate Conference of December 2009 concluded having set no ambitious targets. The international community has only half-heartedly accepted a maximum global warming limit of +2 °C. That makes it all the more important that Europe continues to move forward decisively as the “climate protection engine” and demonstrates concrete ways to improve climate protection. Hence, this is just the beginning of activities for greater climate protection. What is now moving increasingly into focus is the issue of implementing the +2 °C limit in various sectors, such as industry, transport and housing.

Germany for its part wants to make its contribution by reducing CO₂ emissions by 40% by 2020, over the figure of the base year, 1990. The UK, likewise, has committed to reducing CO₂ (equivalent) emissions by 26% by 2020, and by 80% by 2050 for the same base year of 1990 (United Kingdom Parliament, 2008). Other EU countries too have adopted

ambitious climate protection targets. Here, even the long-term goal of CO₂-neutral economic development by 2050 is being discussed – meaning solutions which permit economic growth with the CO₂ account completely balanced. But here too, the question arises: how is it to be implemented? Considerable shares of CO₂ emissions have hitherto been generated by the sectors housing/built-up areas, commercial development and transport. In the UK, for example, 22% of emissions came from road transport, 14% from residential, 16% from businesses, and the balance from energy and other uses (Department of Energy and Climate Change, 2009a). That identifies three essential CO₂ reduction sectors or “setscrews”, which can be influenced by spatial planning. In Europe, land use, residential and commercial development and the development of the transportation infrastructure are as a rule controlled by means of spatial planning instruments, for which Strategic Environmental Assessments (SEA) must generally be carried out under the terms of a European Union Directive European Parliament and Council of the European Union, 2001. Indeed, SEA (and Environmental Impact Assessment) is recognised as the vehicle for the implementation of climate protection within spatial planning (Forsyth et al., 2009), and, thus, can be seen as the right tool for ‘climate proofing’ (Frøde and Kloss, 2011). The European Commission white paper on ‘Adaptation to Climate Change’ states that member states, stakeholders and the Commission should work together to “ensure that account is taken of climate change impacts when implementing the Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) Directives and spatial planning policies” (EC, 2009 p.13). Therefore, particularly such spatial

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control instruments as regional and land-use planning (Fischer, 2010; Hoehstetter et al., 2010; Rannow et al. 2010) have a decisive role to play, in combination with the SEA, in achieving CO₂ savings (Birkmann and Fleischhauer, 2009).

As currently applied, there is evidence that SEA is used to consider Climate Change (CC) in the context of the geographical area covered by the plan being assessed only, rather than also considering the global implications of resulting emissions (see, for example, Halsnæs and Trærup, 2009). We begin with the hypothesis that SEA, when applied to spatial planning at regional and local levels, does not accommodate the CO₂ reduction targets which are necessary for achieving the +2 °C limit. We test this hypothesis by determining what we might expect to see in any SEA when considering the CC implications of a plan, in the sectors over which spatial planning has influence, and examining practice to see whether CO₂ reduction targets are implemented. The following section sets out the methodology used, with the two subsequent sections presenting case studies of regions within Germany and England, followed by an evaluation of the SEA Directive with respect to the obligations it imposes on member states to protect the climate.

2. Methodology

In determining the extent to which the SEA has steered the plan towards the necessary CO₂ reduction targets, a simple review checklist has been developed. Such checklists are commonly applied for determining the quality of environmental assessment reports (see, for example, Barker and Wood, 1999; McGrath and Bond, 1997; Sandham and Pretorius, 2008) although they tend to examine procedural compliance rather than substantive outcomes. Despite this weakness, a critical characteristic is that it adds transparency to the evaluation (Fuller, 1999) allowing others to question, and potentially amend and improve, the standards expected. Criteria were developed drawing on publicly available guidance relating to SEA and CC impacts available from the OECD, Canadian Environmental Assessment Agency, England and Wales Environment Agency and the UK Department for Communities and Local Government. Many other sources of advice exist on a global basis, but it was felt that the critical issues would be covered by this selection (Table 1).

These criteria are applied to the cases of the state of Saxony in Germany, and the East of England region in England, with minor changes to reflect the scope of spatial planning in the two regions.

3. Analyses of global climate change issues addressed in SEA and regional plans in Germany

SEAs presented in the form of environmental reports and supplementary documentation for the new State Development Programme in the German State (Bundesland in German language) of Saxony and for several regional plans within the Saxony State were analysed. This analysis revealed deficiencies in the SEAs' scope of investigation; aggregated results are presented in Table 2.

The environmental report on the Upper Elbe Valley/Eastern Ore Mountains Regional Plan (OEOE) mentions the term CC only once. An examination according to the checklist for environmental reports revealed only "emissions", and micro- or meso climate effects. According to the Plan, major "industrial and commercial" projects automatically have no significant negative environmental impacts in terms of "emissions".

In the environmental report on the Upper Lusatia-Lower Silesia Regional Plan (OLNS), the term CC does not appear, however the report also addresses the local and meso-scale climate of residential areas and climate protection forests.

In the environmental report for Western Saxony Region (WSN) the term CC does not appear at all. However, CO₂ emissions are mentioned, as well as greenhouse gases emissions reduction targets. Specifically, the

Table 1
Evaluation criteria for reviewing environmental reports.

Evaluation criteria		Source
Scoping (CC effects addressed)	Mitigation	2,4
	Adaptation	2,4
	Opportunities	2,4
National goals (with regard to CC)		1,4
State goals (with regard to CC)		4
Regional scale	Goals	4
	Methods for regionalisation	3,4
Mitigation addressed	Avoidance	1,2,3,4
	Reduction	1,2,3,4
	Offsetting	1,2,3,4
Adaptation addressed		1,2,3,4
CC	General principles/strategies	1
	Objectives/goals	3,4
	Factors	3,4
	Indicators	3,4
	Targets	3,4
Alternatives related to CC	Content related	3,4
	Spatial/structural	3,4
CC aspects of Sectoral planning contents	Transport	1,3
	Energy	1,3
	Housing	1,3
	Agriculture/forestry	1,3
Monitoring		1,2,3,4
Participation		1,2,3,4
Cumulative effects	On CC	2,3
	By CC	2,3
Large-scale impacts assessed		2
Long-term impacts assessed		3
"CC–biodiversity" relationship addressed		1

CC = climate change.

1 – Department for Communities and Local Government (2007).

2 – Fptcccea (2003).

3 – Levett-Therivel Sustainability Consultants et al. (2007).

4 – Risse and Brooks (2008).

21% reduction of greenhouse gases under the Kyoto Protocol by 2008 or 2012 compared with 1990, which are contained in the sustainability strategies of both the Federal (2002) and the Saxony State Climate Protection Programmes. A few technical, governmental and planning measures for CO₂ emissions reduction have been formulated, namely the expansion of decentralized heating, imposing speed limits on motor vehicles. Reference to the above climate protection goals is established via the designation of land for renewable energy sources, mainly wind energy. The following monitoring indicators have been selected: CO₂ emissions (pressure); share of renewable energy – the wind energy (response).

In the environmental documents for the South-Western Saxony Regional Plan (SWSN) the term CC does not appear. A few objectives of the Renewable Energy Law of 2004, the Climate Change Programme of 2001 and the Climate Report of 2005 are mentioned. Only the local and regional bio-climate and terrain climate are addressed.

Chemnitz-Ore Mountains Regional Plan (CHE) does not address CC even indirectly.

The Saxony State Development Programme (SAX), which is currently being drafted, clearly shows the change in basic attitude towards consideration of global CC in comparison to above discussed regional

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