



## Climate change mitigation and adaptation in strategic environmental assessment

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### ABSTRACT

Countries are implementing CO<sub>2</sub> 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 CO<sub>2</sub> 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 CO<sub>2</sub> emissions by 40% by 2020, over the figure of the base year, 1990. The UK, likewise, has committed to reducing CO<sub>2</sub> (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 CO<sub>2</sub>-neutral economic development by 2050 is being discussed – meaning solutions which permit economic growth with the CO<sub>2</sub> account completely balanced. But here too, the question arises: how is it to be implemented? Considerable shares of CO<sub>2</sub> 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 CO<sub>2</sub> 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’ (Fröde 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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, CO<sub>2</sub> emissions are mentioned, as well as greenhouse gases emissions reduction targets. Specifically, the

**Table 1**  
Evaluation criteria for reviewing environmental reports.

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

**Table 2**  
Climate Change scope of environmental reports in Saxony.

Evaluation criteria		Region/state					SAX
		Region					
		OEOE	OLNS	WSN	SWSN	CHE	
<b>Scoping</b> (CC effects addressed)	Mitigation	–	–	–	–	–	+
	Adaptation	–	–	–	–	–	+
	Opportunities	–	–	–	–	–	–
<b>National goals</b> (with regard to CC)		+/o	–	+/o	o	–	–
<b>State goals</b> (with regard to CC)		+/o	–	+/o	o	–	–
<b>Regional scale</b>	Goals	–	–	+/o	–	–	+ (Scoping)
	Methods for regionalisation	–	–	o	–	–	–
<b>Mitigation</b> addressed	Avoidance	o	–	o	–	–	+ (Scoping)
	Reduction	o	–	o	–	–	+ (Scoping)
	Offsetting	–	–	o	–	–	–
<b>Adaptation</b> addressed		o	–	–	–	–	+ (Scoping)
	<b>Climate Change</b>						
	General principles/strategies	o	–	o	–	–	+/o (Scoping)
	Objectives/goals	–	–	+/o	–	–	+/o (Scoping)
	Factors	–	–	–	–	–	–
	Indicators	–	–	o	–	–	–
	Targets	o	–	o	–	–	–
<b>Alternatives</b> related to CC	Content related	–	–	–	–	–	–
	Spatial/structural	–	–	–	–	–	–
CC aspects of <b>Sectoral</b> planning contents	Transport	–	–	o	–	–	+ (Scoping)
	Energy	–	–	o	o	–	+ (Scoping)
	Housing	–	–	o	–	–	+ (Scoping)
	Agriculture/forestry	o	–	–	–	–	–
<b>Monitoring Participation</b>		–	–	+/o	–	–	–
		–	–	–	–	–	–
<b>Cumulative</b> effects	on CC	–	–	o/–	–	–	–
	by CC	–	–	–	–	–	–
<b>Large-scale</b> impacts assessed		–	–	–	–	–	–
<b>Long-term</b> impacts assessed		–	–	–	–	–	–
<b>“Climate change – biodiversity”</b> relationship addressed		–	–	–	–	–	–

“+” – climate change issues considered, “o” – slightly or indirectly considered, “–” – not considered, no information/specifications.

OEOE = Upper Elbe Valley/Eastern Ore Mountains Region (February 2009).

OLNS = Upper Lusatia-Lower Silesia Region (April 2009).

WSN = Western Saxony Region (May 2008).

SWSN = South-western Saxony Region (May 2008).

CHE = Chemnitz-Ore Mountains Region (June 2008).

SAX = Free State of Saxony (March 2010).

plans. The following key points that are of a particular importance have been developed:

- the predictable consequences of progressive global warming and the need to increase the share of renewable energies;
- the development of a spatial planning strategy which is specifically aimed at addressing the CC.

With the revision of the 2003 Saxony State Development Programme by 2011, the climate protection relevant stipulations and adaptation strategies for forward looking management of the effects of CC need to be updated and improved. In particular, the requirements for the expansion of renewable energies, for the coordination role of regional planning on the basis of regional energy and climate concepts, for climate-friendly development of areas for housing and traffic infrastructure, and for adaptation to the impacts of CC, e.g. preventive flood protection, precautionary protection of water resources, or protection from the effects of heat in urban areas, are to be examined and formalised.

As detailed above, the older, currently valid regional plans have almost no references to global CC (Western Saxony Region is one positive exception). In contrast, the Saxony State Development Programme addresses the issue of global CC in sufficient detail. However the Programme has some weaknesses with respect to CC integration, most important of them (1) absence of targets in the SEAs for CO<sub>2</sub> reduction, (2) large-scale and long-term impacts are not assessed, and (3) climate-friendly alternatives has not been considered. These considerations show that current German legislation (cf. Weiland, 2010) gives a potential

opportunity to integrate global CC concerns into SEA and regional planning processes. This opportunity can be further developed and made more accessible by specifying some concrete ways of integration.

#### 4. Analyses of global climate change issues addressed in SEA and regional plans in England

With regards to SEA, responsibility for implementation rests with the devolved administrations (Wales, Northern Ireland and Scotland) leaving the UK Government to legislate for England (which is the focus for this case study).

In England, the Planning and Compulsory Purchase Act 2004 made it compulsory for local and regional authorities to undertake Sustainability Appraisal (SA) of their emerging spatial plans and, based on the dual obligations to conduct SA and SEA, they produced guidance on how to conduct SA which would be SEA Directive compliant (ODPM, Office of the Deputy Prime Minister, 2005). More recently, this guidance has been superseded for local authorities and regional authorities were abolished by the newly elected Government on May 27th 2010 (and so regional plans, called Regional Spatial Strategies, are no longer valid). However, the SAs reviewed had all been developed based on this 2005 guidance.

There are some commonalities which can be identified across the environmental reports (Table 3). In general, national goals are well known, but this does not lead to any suggestions for avoidance of CC. Also, the spatial planning remit is constrained by the geographical boundaries being considered, and so large scale impacts (defined as

**Table 3**  
Climate Change scope of environmental reports in the East of England.

Evaluation criteria		Region/state					EE
		Region					
		N/B/ SN	B	NN	GY	KLWN	
<b>Scoping</b> (CC effects addressed)	Mitigation	+	+	+	+	+	+
	Adaptation	+	+	o	+	+	+
	Opportunities	–	o	–	o	–	o
<b>National goals</b> (with regard to CC)		+	+	o	+	+	+
	<b>Regional scale</b>						
Goals	Goals	+	o	o	+	+	+
	Methods for regionalisation	–	–	–	–	–	–
	<b>Mitigation</b> addressed						
Avoidance	Avoidance	–	–	–	–	–	–
	Reduction	+	+	o	o	+	+
	Offsetting	–	–	–	–	o	–
<b>Adaptation</b> addressed		+	+	–	+	+	+
	<b>Climate Change</b>						
General principles/strategies	General principles/strategies	+	+	+	+	+	+
	Objectives/goals	+	+	+	+	+	+
	Factors	o	o	o	o	o	o
	Indicators	+	+	+	+	o	+
<b>Alternatives</b> related to CC	Targets	o	o	–	–	–	–
	Content related	+	+	–	+	–	o
	Spatial/structural	–	–	–	–	–	–
CC aspects of <b>Sectoral</b> planning contents	Transport	o	+	o	o	+	+
	Energy	o	+	+	+	+	+
	Housing	o	+	o	+	o	+
<b>Monitoring</b> Participation		o	+	o	+	o	+
		+	+	+	+	+	+
<b>Cumulative</b> effects	on CC	o	+	–	+	–	–
	by CC	o	+	–	+	–	–
<b>Large-scale</b> impacts assessed		–	–	–	–	–	–
<b>Long-term</b> impacts assessed		+	o	o	o	o	o
<b>“Climate change – biodiversity”</b> relationship addressed		o	–	–	–	–	+

“+” – climate change issues considered, “o” – slightly or indirectly considered, “–” – not considered, no information/specifications.

N/B/SN = Norwich City/Broadland/South Norfolk (common spatial plan) (September 2009, prepared by Scott Wilson consultants).

B = Breckland District Council (March 2009, prepared in house).

NN = North Norfolk District Council (September 2008, prepared in house).

GY = Great Yarmouth District Council (February 2009, prepared in house).

KLWN = Kings Lynn and West Norfolk District Council (October 2009, prepared in house).

EE = East of England Region (March 2010, prepared by Land Use Consultants and Scott Wilson consultants).

being larger scale than the area covered by the plan) are not considered directly. Long term impacts, defined as those lasting longer than the period the plan is in force for, are also rarely directly considered or, if they are, the duration which is meant by “long-term” is not defined. The SEAs stick to the spatial plan content and do not extend to suggestions for how CC goals might be regionalised, perhaps through the use of new institutions. Another weakness has been the linkage of biodiversity and CC impacts, although it is significant that new guidance produced by England’s nature conservation body, *Natural England* (2009) has improved practice in the East of England SA published in early 2010.

The most significant weakness is that no targets are set in the SAs for CO<sub>2</sub> reduction, even though there is knowledge of the national obligations and some control over the emissions from future housing, transport and energy developments.

The results indicate there is much greater awareness of climate change in SEA in the East of England than in the state of Saxony, and the climate implications of plans are considered. However, the awareness in Saxony is rising during the planning process of the new overall Saxony State Development Plan. And, it is also clear that SEA is not being used in either case to actively contribute to CO<sub>2</sub> reduction. That is, from a climate change perspective, SEA is passive rather than active.

## 5. Technical and Substantive Discussion about the Interests of Climate Protection in Environmental Reporting (Annex I, SEA Directive) and in the SEA Procedure

### 5.1. On the concept of climate as a protected asset

Annex I (f) of Directive 2001/42/EC (the SEA Directive) demands that in the implementation of SEA, effects on climatic factors should be examined as well, including in regional plans and land-use plans. However, it is not clear what exactly the term “climatic factors” means in planning and assessment practice (Schwarz et al., 2011). Certainly, the effects on the micro- and meso-climate, i.e., on local and regional climatic conditions, must be included. Hence, the effects of newly certified residential areas on the intake of fresh and cold air into cities in the context of land-use planning must already have been the object of regular investigations in the context of SEAs in the past (Baumueller, 2008). However, given the requirements for stronger consideration of the CC mitigation mentioned above, and for the fulfilment of the global targets vaguely set in Copenhagen for greenhouse gas and CO<sub>2</sub> reduction, the definition of this protected asset named in the SEA Directive needs to be expanded. Accordingly, climatic factors would in future have to include not only regional and local climate conditions, but also the requirements of global climate protection (Heiland, 2009). Where else but at the preliminary plan and programme level can the course be set which will determine the level of greenhouse gas or CO<sub>2</sub> emissions resulting from economic development? Where else but during SEA might lower-emissions plan and programme alternatives be developed? Where else but in SEA can health impacts resulting from environmental determinants be accommodated through the development and implementation of a significant proportion of adaptation measures at a local or regional level (Spickett et al., 2011)? “Which topics have to be investigated during which step of the assessment procedure?” (Weingarten, 2010) is one of the major questions related to climate change issues.

### 5.2. Operationalisation of the Goal of Climate Protection as a Component of Environmental Protection

Under Annex I (e), the environmental protection targets established at the international or Community level or at level of the member states, and hence also the climate protection goals, are to be elucidated in the Environmental Report of a SEA. The climate protection goals thus serve as a standard for judging the results of a plan or programme. How the global goal of a maximum warming by +2 °C, or a concrete national target like the German target of a 40% CO<sub>2</sub> reduction by 2020, can be operationalised at the regional or land-use planning level, is still unclear methodologically. As a first step, the share that a region or a municipality contributes to the total of the greenhouse-gas and CO<sub>2</sub> emissions of a member country should be ascertained. In the UK this would be relatively straightforward as statistics are already published on the emissions from every local authority in the UK, which currently indicate that, on average, 46% of CO<sub>2</sub> emissions come from the industrial and commercial sector, 28% from domestic users, and 26% from road transport (Department of Energy and Climate Change, 2009b). Based on figures like these, the regional and local reduction goals which are necessary to meet the short term national targets (40% for Germany, 26% for the UK) can be quantified and established based on assumptions about the likely contribution of national strategies in place to reduce emissions from the energy sector and others not controlled by spatial planning. At the time of the preparation of a plan or programme, these targets must then be referenced to the respective lifespan of a spatial plan, generally, for ten years. The spatially relevant contents of the plan or programme must then be developed in such a way that a reduction of the greenhouse-gas and CO<sub>2</sub> emissions oriented towards the target can in fact be achieved. That would ultimately permit the requirement in Annex I (e) of the SEA Directive, to describe how the climate protection

goal is being taken into account in the drafting of the plan or programme, to be fulfilled as well.

The situation is aggravated in Germany by the fact that the national targets of the Federal Government contain no reference to the concrete contributions which particular regional administrative bodies or planning agencies need to make towards their implementation allowing the overall target to be met. In global terms, national CO<sub>2</sub> emission reductions are calculated based on the emission apportionment regime (Anderson et al., 2008) which assumes that the global carbon budget can be divided into national portions in any chosen base year. The goal of future planning-oriented climate protection research must therefore be to develop consistent and practically applicable methodological approaches for devolving and applying the climate protection target to a certain local planning level. With the help of a “regionalised” climate protection target, or one which is broken down by technical planning sectors, the minimal target agreed upon in Copenhagen could then be realised via the SEA.

### 5.3. Mitigation and alternatives

The SEA (under SEA Directive Annex I (g)) offers the possibility for developing measures with the aid of which considerable negative environmental impacts, and hence also considerable greenhouse-gas and CO<sub>2</sub> emissions, can be prevented, reduced or compensated. Thus, if it appears that a plan or programme will fall considerably short of accomplishing its goal of meeting a regionalised or local climate protection target, the SEA Directive permits the development of appropriate protection and compensation measures. In the context of a regional plan, increases in CO<sub>2</sub> emissions could be avoided altogether by cancellation of the respective building permissions, or at least reduced considerably, for example by more compact building structures and internal development (Wende et al., 2010). Net CO<sub>2</sub> emissions could be reduced through replacement of building stock with more energy efficient buildings, or through improving the energy efficiency of existing stock. The resulting emissions could be compensated by the development of additional CO<sub>2</sub> sinks, e.g. by reforestation or the re-wetting and renaturalisation of flood plains and boglands (Minnen et al., 2008).

Regionalised or local climate protection targets also permit the building authorities responsible for the plan to evaluate the plan or programme draft, and, if targets would not be met, to develop appropriate, less environmentally damaging and climate-friendlier alternatives (Dessai et al., 2005) for the use of scenarios for formulating alternatives). Thus, not only could single measures for meeting climate protection targets in the plan or programme be implemented; fundamentally different plan and programme approaches could also be developed. Such systemic alternatives as ensuring mobility by expansion of public transport vs. the further development of individual motor traffic could provide a wide range of contributions towards meeting climate protection targets (Heiland, 2009). The SEA Directive, via Article 5 para. 1 and Annex I (h), demands the representation of various alternatives, albeit those deemed ‘reasonable’ by the planners.

### 5.4. Monitoring

Finally, according to the SEA Directive Annex I (i), the Environmental Report of a SEA procedure must contain a description of the measures to be applied for monitoring unforeseeable environmental impacts (Hanusch and Glasson, 2008). However, examples of monitoring being provided for the purpose of climate protection are rare in SEAs (Burdge, 2008). For planning practice, this means that the development of greenhouse-gas and CO<sub>2</sub> balance sheets during the implementation of the plan or programme should also be subject to monitoring. If considerable deviations from the attainment of a regional or local climate protection targets are apparent during the implementation of the plan, the planning authority could take suitable remedial measures at an early date; e.g. it could provide for and

implement additional CO<sub>2</sub> binding or even CO<sub>2</sub> avoidance. A monitoring programme should however be oriented towards the time horizon of the environmental goal – i.e., in Germany, a 40% CO<sub>2</sub> reduction target by 2020 – and not towards the lifespan of the respective plan or programme, which could be shorter.

### 5.5. SEA procedural elements

However, as an administrative procedure too, the SEA provides various elements which help make climate protection interests visible, and to implement them. Under Article 6 of the SEA Directive, the Environmental Report and the draft of the plan or programme are to be made accessible to other authorities and to the public via consultations. That ensures more transparent planning, and allows stakeholders to check the contents of the plan or programme in reference to substantial environmental goals, and thus also to existing climate protection targets. If a plan or programme diverges substantially from the regional or local climate targets, the public, and other authorities can indicate this specifically, and thus exert influence in favour of a climate-friendlier planning process. It is therefore also important to create new structures in existing environmental authorities with their own competence in the area of climate protection and climate adaptation. The creation of these administrative structures is conceivable for example within air pollution protection offices at the regional or local levels.

## 6. Conclusions

Strategic Environmental Assessment is a particularly suitable instrument for the implementation of climate protection at the regional or local level, or in sectoral planning, such as transport planning. SEA can be seen as a real ‘policy integration tool’ (Cashmore et al., 2010) to encourage greater attention in policy formation for climate change mitigation. For climate protection to play a more important role within this strategic procedure however, some basic aspects must be adapted or taken into account. First of all, the EU should define the protected asset “climatic factors” more clearly in the SEA Directive than has hitherto been the case, particularly, too, for the purposes of global climate protection and climate adaptation (Helbron et al., 2011). However, it has to be taken into account that SEA should not be overstretched by extensive new requirements on ‘climate proofing’ (Runge et al., 2011). SEA is a tool to assess the impacts on the environmental parameters listed in legislation, like soil, biodiversity, water etc. Moreover, concrete practical action guidelines should be developed in the EU and in its member countries for the methodological implementation of climate protection in strategic assessment procedures. Methodological guidelines for devolving global climate protection targets down to the regional and local levels are necessary. Some first ideas about an operationalisation and regionalisation of targets have been made in this article. These guidelines should also contain concrete practical indications for the development of “climate friendlier” planning or programme alternatives, and for the development of avoidance, reduction and compensation measures which ensure low climate impact. By means of EU-wide pilot projects, practical ways could thus be demonstrated to achieve greater climate protection in development planning with the aid of the SEA. Particularly spatial and urban planning has a vast potential for energy and CO<sub>2</sub> along with other greenhouse gases reduction, so that it is this planning or programme sector, and the transport sector which should be specifically addressed. The procedural step of consultations serves to focus attention on climate protection issues, particularly in regional and local populations.

Pragmatic steps which are critical in facilitating the use of SEA for climate protection are adequate monitoring of current emissions and responsible subdivisions and individuals in environmental authorities. In this small case study two typical situations have been identified: 1) in Germany, there are insufficient data on existing local authority emissions collected as a basis for adequately assessing spatial plans;

2) in the UK, sufficient data are available on which to adequately assess spatial plans, but these data are not being used at present as the basis for setting climate protection targets. Thus methodological guidance is needed which sets out: (1) data which needs to be collected by authorities responsible for spatial plans; and (2) the basis on which climate protection targets can be set.

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