



Adaptation to Climate Change and Strategic Environmental Assessment

WP 4.4

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Abstract

The integration of climate change adaptation into the planning process is becoming more and more important. In recent years, international organisations, the European Union and national governments have invested considerable effort to integrate environmental concerns into the planning process by making use of Strategic Environmental Assessment (SEA). The question arises: “how useful is this tool to address problems of climate change adaptation in the planning process?” Therefore the objective of this report is to examine if SEA could be a useful tool in climate change decision making.

This report explores the necessary elements needed within the SEA process for the successful incorporation of climate change impacts and adaptation. The report explores elements an SEA from the screening phase to the environmental report, its detailed assessment and its implementation stages. The report also assesses international law, European state practice and EU recommendations.

In conclusion, the report shows that SEA can be a useful tool to promote suitable actions for adapting to climate change, into the planning process as well as to highlighting possible adaptation conflicts with other existing regional/national plans and programmes. Sustainable planning is one of the main objectives of the SEA. Integrating concerns regarding climate change adaptation in early stages of the planning process would enhance sustainable development. It would ensure that impacts with a higher level of uncertainty, such as climate change, are taken into account throughout the various phases of developing plans and programmes. The screening phase examines if the scope of the plan or programme takes into account climate change risks and vulnerability through further investigation of the climate change sensitivity. In the scoping phase it can be determined what climate change variables and elements of the plan or programme need to be assessed as well as which adaptation options can be included. The environmental report estimates the likely significant effects the plan or programme is likely to have on the environment. Climate change can influence these effects in the future and therefore climate change impacts on the plan or programme need to be assessed in the early stages for use as a baseline description. Finally at the implementation and monitoring phase climate change indicators can be taken into account to make sure that the plan and



programme can withstand climate change. The study shows that the integration of climate change in the SEA is already widely supported by the international and European community. Several countries already took climate change adaptation into account into their planning process by producing guidelines.



Content

1.	Introduction	11
2.	The development of Strategic Environmental Assessment as a legally embedded tool worldwide	15
3.	Steps in an SEA and potential entry points for adaptation to climate change (the SEA-Directive)	19
3.1	Screening.....	20
3.1.1	The process.....	20
3.1.2	Considering climate change adaptation in the screening process	28
3.2	Scoping.....	30
3.2.1	Process	30
3.2.2	Considering climate change adaptation in the scoping process	30
3.3	Environmental report.....	30
3.3.1	Process	30
3.3.2	Considering climate change adaptation in the Environmental Report	31
3.4	Adoption and monitoring	34
3.4.1	Process	34
3.4.2	Considering climate change adaptation in implementation and monitoring process	35
4.	SEA and adaptation strategies	37
5.	International and European intentions and progress on incorporating climate change impacts and adaptation in an SEA.....	40
5.1	Espoo convention.....	40
5.2	Convention on Biological Diversity	41
5.3	The European Union	42



5.4 The Habitats-Directive and Birds-Directive	42
5.5 Water Framework Directive and Flood Directive.....	45
5.6 Organisation for Economic Cooperation and Development (OECD).....	46
6. National intentions and progress on incorporating climate change impacts and adaptation in SEA	49
6.1 The Netherlands.....	49
6.2 Ireland.....	50
6.3 Belgium.....	51
6.4 United Kingdom.....	51
7. Advantages of applying an SEA and integrating climate change adaptation considerations.....	54



BOXES

PAGE

Box 1 PPs to prevent flood events due to an increase in storms and sea level rise as the result of climate change, a case of civil emergency?	23
Box 2 Question: Do PPs, which set a framework for coastal defence works, require an SEA?	27
Box 3 Integration of climate change adaptation in PPP at different levels	48



	PAGE
FIGURES	
Figure 1 Schematic diagram illustrating the process of adaptation	13
Figure 2 SEA procedural requirement	21
Figure 3 SEA procedural requirement and entry point in screening stage	30
Figure 4 Environmental baseline and the inclusion of climate change concerns	32
Figure 5 SEA procedural requirement and entry point in scoping stage and environmental report	34
Figure 6 Examples of indicators	35
Figure 7 SEA procedural requirement and entry point in implementation and monitoring process	36



ABBREVIATIONS

CBD	Convention on Biological Diversity
COP	Conference of the Parties
DAC	Development Assistance Committee
Defra	Department for the Environment, Fisheries and Rural Affairs
EA	Environmental Assessment
EIA	Environmental Impact Assessment
FRMP	Flood Risk Management Plan
HA	Habitats Assessment
IPCC	Intergovernmental Panel on Climate Change
MS	Member States
NEPA	National Environmental Policy Act
NGO	Non-governmental organisation
OECD	Organisation for Economic Cooperation and Development
PP	Plan and Programme
PPP	Plan, Policy and Programme
PPS	Plan, Programme and Strategy
RBMP	River Basin Management Plan
RIA	Regulatory Impact Assessment
SAC	Special Area of Conservation



SCI	Site of Community Importance
SEA	Strategic Environmental Assessment
SIA	Sustainability Impact Assessment
SMP	Shoreline Management Plan
SPA	Special Protected Area
UK	United Kingdom
UKCIP	United Kingdom Climate Projections
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNECE	United Nation Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
USAID	United States Agency for International Development
WFD	Water Framework Directive
WMB	Dutch Environmental Management Act



GLOSSERY OF TERMS

Adaptation

An adjustment in natural or human systems in response to actual or expected climatic stimuli of their effects, which moderates harm or exploits beneficial opportunities (IPCC 2007b; Feenstra *et al.* 1998)

Vulnerability

The degree to which a system is susceptible to, and unable to cope with, the adverse effects of climate change, including climate variability and extremes (IPCC 2007b)

Adaptive capacity

The ability or potential of a human or natural system to respond successfully to climate variability and change (IPCC 2007b)

Maladaptation

Business-as-usual development which, by overlooking climate change impacts, inadvertently increases exposure and/or vulnerability to climate change. It can also include actions undertaken to adapt to climate impacts that do not succeed in reducing vulnerability but increase it instead (OECD 2009a)

Ecosystem approach

A strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. (United Nations Convention on Biological Diversity 2000)



Adaptation to Climate Change and Strategic Environmental Assessment (SEA)

1. Introduction

Global climate change is one of the main issues in today's international environmental policy. International organisations and institutions are trying to find acceptable solutions to cope with the changing climate. Efforts made in this area are mainly focused on mitigating against climate change, by among other things, reducing greenhouse gas emissions. International and European attention to adapt to climate change, such as the Bali Action Plan¹, under the United Nations Framework Convention on Climate Change (UNFCCC) and the EU White Paper on Adaptation², have ensured that adaptation to climate change is becoming more and more important. The IMCORE project pays explicit attention to climate change adaptation in North West Europe's coastal region. Furthermore the CLIMAR project develops a framework to evaluate climate change impacts and adaptation responses for marine activities within the Belgian coastal zone. It is in light of these projects that this report is written.

Adaptation to climate change is a process where strategies are developed and implemented that moderate, cope with and take advantage of the consequences of climate events (IPCC 2001). As the impacts of climate change will strongly differ regionally and locally, actions that tackle these impacts will need to be decided and undertaken at local, regional and national level. In order to do so, several countries (such as France, The Netherlands, United Kingdom (UK), Finland, Denmark, Spain, etc.) have already developed national adaptation strategies (ECCP 2006, Prutsch *et al.* 2010 and European Environment Agency).

Based on the recommendations of the United Nations Development Programme (UNDP) "*Adaptation Policy Framework*" (Niang-Diop *et al.* 2005), the United States Agency for International Development (USAID) "*Coastal Adaptation Guide*" (USAID 2009) and thorough research key elements of an adaptation strategy are identified as:

¹ UNFCCC, Decision 1/CP.1 in FCCC/CP/2007/6./Add.1, 3-15 December 2007.

² COM (2009) 147 final, White Paper: Adapting to climate change: Towards a European framework for action.



- 1) Setting the framework in which the adaptation strategy will be implemented. This includes the institutional processes in which the adaptation strategy and measures are, or will be planned and implemented and the scale of the strategy (time scale, spatial scale);
- 2) Knowledge gathering: assessing current and future climate risks, assessing current and changing climate socio-economic conditions and assessing vulnerability for climate adaptation;
- 3) Define policies and measures with the overarching objective of reducing the country's vulnerability;
- 4) Prioritise actions: identify and prioritise the key climate risk, as well as identify and prioritise adaptation options for policies and measures;
- 5) Engage Stakeholders: gain public acceptance of the strategy;
- 6) Revise the adaptation strategy. An adaptation strategy is not a simple "one-shot" deal, instead it is an iterative, continuous learning process. The more information there will be available, the more accurate the adaptation strategy can be developed.

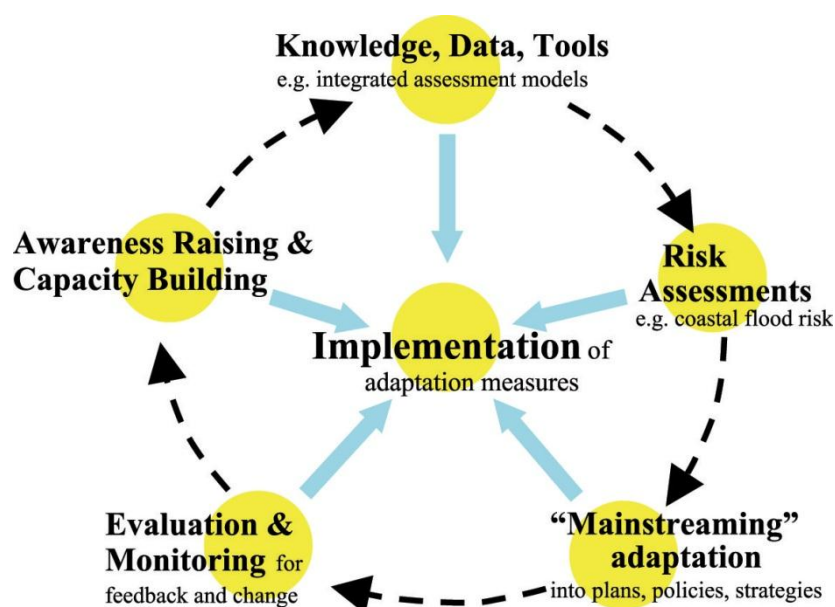


Figure 1. Schematic diagram illustrating the process of adaptation
(source: IPCC 2007b, based on Warrick 2000)



An adaptation strategy can be a stand-alone plan, but in particular it is an implementation plan that describes how policies and measures are to be incorporated into existing sectoral strategies, national development plans, management plans, etc. (Niang-Diop *et al.* 2005) This is also referred to as climate change adaptation mainstreaming. Climate change adaptation mainstreaming is the integration of climate change concerns and adaptation responses into relevant policies, plans, programmes, and projects at the national, sub-national, and local scales (USAID 2009).

The need to integrate climate change adaptation into the planning and decision-making process and to make these processes more 'climate proof' is highlighted in the UNDP *"screening tools and guidelines"* (Olhoff *et al.* 2010) and also in the *"Guidance on Water and adaptation to climate change"* of the UN Economic Commission for Europe (UNECE 2009). Plans prepared without considering the growing risks and vulnerabilities related to climate change, may lead to maladaptation and inadvertently promote exposure to climate risks. Maladaptation is defined by the Organisation for Economic Cooperation and Development (OECD) in *"Policy Guidance on Integrating Climate Change Adaptation into Development Co-operation"* as *"Business-as-usual development which, by overlooking climate change impacts, inadvertently increases exposure and/or vulnerability to climate change. It can also include actions undertaken to adapt to climate impacts that do not succeed in reducing vulnerability but increase it instead"* (OECD 2009a).

Adaptation to climate change calls for a new paradigm in the planning process, one that considers a range of possible future climate conditions and associated impacts. Nevertheless it is not convenient to deal with possible climate change effects, because although there is considerable consensus among climate scientists that climate change is an unequivocal, accelerated and human-induced process, there is much less agreement on how climate change will affect natural and social systems (IPCC 2007a).

The question is now how to facilitate decision-making in the planning process in light of climate change, not only regarding to the development of adaptation strategies, but also in the existing planning process. SEA is particularly relevant in this context. SEA involves assessing and evaluating the possible impacts, whether adverse or beneficial, that a strategic action (e.g. a plan or programme) may have on the environment. Since SEA is already a widely accepted and legally embedded tool, the approach would be to examine the feasibility of incorporating considerations of climate change impacts within



existing modalities for plan design, and implementation. The question is: “*Is SEA a useful tool to address the problems of climate change in the planning process?*” Positive to this approach is that the integration of climate change considerations can be accomplished at an early stage in the planning process. The Organisation for Economic Cooperation and Development (OECD) already published a report on the incorporation of climate change impacts and adaptation in Environmental Impact Assessment (EIA) (Argawala *et al.* 2010). However it remains very important to investigate possibilities to include climate change considerations in the planning phase, because the approval of projects is based on the policy plans that are developed in an earlier stage.

Firstly, this report examines the context within which SEA is established. It is important to understand the rationale of the tool to identify if the integration of climate change adaptation fits in the purpose of SEA. Secondly the report examines the different steps in the SEA process: its aims, the content it covers and the procedures associated with its implementation, as created by the European Directive 2001/42/EC on the assessment of certain plans and programmes (SEA-Directive). The research will focus on the challenges and the opportunities to incorporate climate change impacts and adaptation in SEA and will examine if SEA can be a useful tool in evaluating adaptation strategies. Finally the report analyses the position of international, European and national legislation in this respect and assesses the progress made towards the inclusion of climate change impacts and adaptation considerations in SEA.



2. The development of Strategic Environmental Assessment as a legally embedded tool worldwide

This section provides the rationale for the development of an SEA as a legal tool for coping with adaptation measures to anticipate climate change effects. According to the Development Assistance Committee (DAC) of the OECD, SEA refers to *“a range of analytical and participatory approaches that aim to integrate environmental considerations into policies, plans and programmes and evaluate the inter linkages with economic and social considerations. The objective of SEA is to promote integrated decision-making”* (OECD/DAC 2006).

SEA is member of the large and diverse environmental assessments (EA) family which include Environmental Impact Assessment (EIA), Sustainability Impact Assessment (SIA), Regulatory Impact Assessment (RIA) and Habitats Assessment (HA). The first legal provisions that can be found for EAs are in the National Environmental Policy Act (NEPA) of the US in 1969. This Act, which established the national policy for the environment of the US, stated that *“every recommendation or report for legislation and other major Federal actions significantly affecting the quality of the human environment should include an environmental impact of the proposed action”*.³ This vague aspiration led to the institutionalisation of several EA processes by a number of US states, and in the mid- 1970s countries such as Canada, France, Australia and New Zealand developed their own EA processes (Craik 2008 and Robinson 1992). As a result of European Union directives EAs have been legally embedded in all the Member States (MS).

At international and European level, the need to develop and apply EAs was closely linked to international developments seeking to strengthen the integration of environmental concerns in development and planning, as well as to promote sustainable development. The Brundtland Report 1987, *Our Common Future*, recommended the concept of “sustainable development” in the International Environmental Law discourse. The report argued that the ability to choose sustainable policy paths requires the simultaneous consideration of ecological, economic, trade, energy, agricultural, industrial and other dimensions, within the same agendas and institutions responsible for the shaping of such policies⁴ (Bina 2008). During the United

³ Sec. 102 [Title 42 US Code § 4332] of the National Environmental Policy Act of 1969.

⁴ WCED, 1987. *Our Common Future*, Oxford University Press.



Nations Conference on Environment and Development (UNCED) in 1992 Agenda 21 was adopted in which it was decided that *“the status of the existing planning and management system should be reviewed and should adopt comprehensive analytical procedures for prior and simultaneous assessment of the impacts of decisions on the economic, social and environmental spheres; these procedures should extend beyond the project level to policies and programmes”*.⁵ Consequently one of the ideas behind EA was the promotion of sustainable development.

The first EAs were mainly at project-level. This was also the case in the EU where the EIA-Directive⁶ was adopted as early as 1985. Fifteen years later, the Commission also adopted a directive on SEA⁷. A project-level EIA assesses the effects on the environment of certain projects which are expected to have a significant effect on the environment. The project proponent needs to prepare the impact analysis and the EIA Report. Public participation and a review by a responsible authority ensures that reasonable alternatives are taken into account. Based on the EIA Report the responsible authority shall decide whether or not to authorize the project (Craik 2008). The project-level EIA was implemented to achieve a more sustainable decision-making process. One of the shortcomings of a project-level EIA to achieve this goal, was the late timing of analysis (sites and modes were already decided), constraining its capacity of decision-making to act proactively upon environmental problems. An SEA should respond to this shortcoming and help strengthen EIAs (Marsden 2008 and Desmond 2007). Policies, plans or programmes (PPPs) encompass a wider range of options than the eventual project. They can also deal with a higher level of uncertainty by using different scenarios since the level of detail is not that high as in a project-EIA. Consequently SEAs contribute to sustainable development since the SEA provides a systematic and effective consideration of the environment at a higher level in an earlier stage (Partidaria 2003).

Since the SEA was originally created under the theory of EIA, SEA therefore follows the same logic and procedure as an EIA, such as: screening, scoping, public participation, external review, and identifying baseline and alternatives (Desmond,

⁵ Agenda 21 The United Nations Programme of Action from Rio, United Nations Conference on Environment and Development (UNCED), Rio de Janeiro, Brazil, 3 to 14 June 1992.

⁶ Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on, O.J. L. 175 5 July 1985, 40-48pp. As amended by the council Directive 97/11/EC of 3 March 1997, O.J. L. 073, 14/03/1997, 5-15pp.

⁷ Directive 2001/42/EC of the European Parliament and of the council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment, O.J. L. 197, 21 July 2001, 30-37pp.



2007). The first definitions of an SEA put emphasis on the fact that an SEA is a *“systematic procedure”, “the preparation of a written report”, and “uses the findings in publicly accountable decision-making”* (Partidaria 2003). Nowadays the notion of an SEA as a process towards mainstreaming sustainability issues is increasingly highlighted rather than the production of a report (Caratti *et al.* 2004). The SEA process will thus contribute more to inform planners, decision makers and affected public on the sustainability of strategic decisions, than the written report does (Partidaria 2003; McCarthy *et al.* 2010). This trend can also be derived from the definition of an SEA given by Partidaria in 2003 reflecting the emergence of this new perspective on SEA:

“SEA is a systematic, on-going process for evaluating, at the earliest appropriate stage of publicly accountable decision-making, the environmental quality, and consequences, of alternative visions and development intentions incorporated in policy, planning or programme initiatives, ensuring full integration of relevant biophysical, economic, social and political considerations” (Partidaria 2003).

Consequently the integration of climate change adaptation concerns into this process will also contribute to better informed decision-making and will ‘climate proof’ the planning process.

The history and motivation behind SEAs, namely the promotion of sustainable development, the integration of environmental concerns at a strategic level and the attention for the process instead of the report, make it clear that the effects of climate change on the PPP and vice versa should be taken into account in the SEA process. If this would not be the case, the SEA process will outrun its aim. Sustainable planning cannot be achieved if the future environment and society are not taken into account in the planning process. Consequently depending on the timescale of the PPP the effects of climate change should be taken into account. It is inherent to an SEA that it identifies alternatives that meet the PPP objectives and that are sustainable (Partidaria 2003). Furthermore an SEA, at the moment of the development of PPPs, can ensure that cumulative impacts are avoided and more impacts can be taken into account. Hence impacts with a higher level of uncertainty need to be taken into account in the development of PPPs, such as climate change impacts (Sheate 2005 and Fischer 2002). This is in line with one of the most important environmental law principles, namely the “precautionary principle” that states: *“where there are threats of serious or irreversible damage to public or to the environment, lack of full scientific certainty shall*



not be used as a reason for postponing cost effective measures to prevent these threats" (Shelton *et al.* 2005). Moreover, since the introduction of EAs in the US in 1969, the EA processes have undergone a number of evolutionary changes (Noble 2001). It can be inferred that an EA in the future will be subjected to change and that the environmental concerns produced by climate change will be taken into account in the EA process.



3. Steps in an SEA and potential entry points for adaptation to climate change (the SEA-Directive)⁸

This chapter provides an overview of the key steps in an SEA process and identifies potential entry points in each step to incorporate information on climate change impacts and adaptation into the existing SEA process. Given the fact that within the EU MS, legal procedures and administrative provisions on SEA were put into place since 21 July 2004, different international and European rules dealing with SEA have been developed. Therefore the report takes the SEA-Directive as the basis of its study.

The SEA-Directive requires an SEA of certain plans-programmes (PP's) that are likely to have significant environmental impacts. The SEA-Directive is not mandatory for policies (Schmidt *et al.* 2005). An SEA nevertheless helps in identifying the impacts of a proposed PP on the environment, rather than the impact of environmental change, such as climate change on the PP. Although the inclusion of adaptation considerations into the SEA process is not strictly included into the SEA-Directive, the plan-maker needs to take into account the effects climate change might have on the PP since this can lead to maladaptation practices and is not in line with the initial purpose of the SEA-Directive to enhance sustainable development. This is reflected in Article 1 of the SEA-Directive which defines the objectives: *"to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to **promoting sustainable development**, by ensuring that, in accordance with this Directive, an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment"* (Article 1).

In order to support sustainable development, the SEA must consist of substantive and procedural requirements. Substantive requirements include the consideration of environmental and socio-economic aspects in the SEA. Procedural requirements can be met in the SEA process of the SEA-Directive (Figure 2) (Fischer 2002).

⁸ Directive 2001/42/EC of the European Parliament and of the council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment, *O.J. L.* 197 21 July 2001, 30-37pp.



SEA Steps

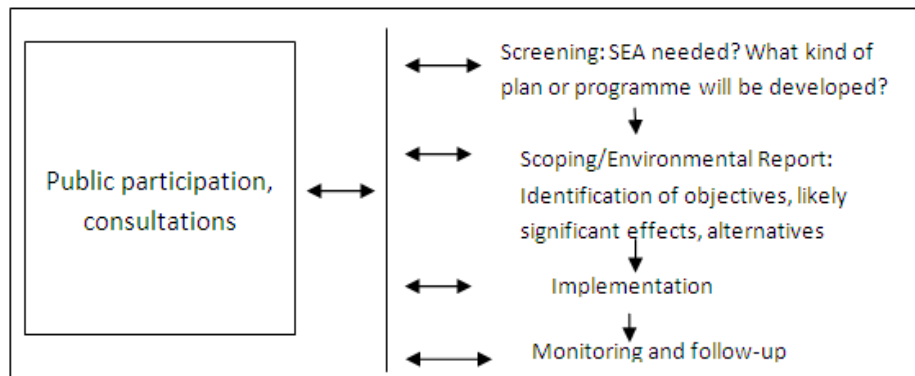


Figure 2. SEA procedural requirements (based on Fischer 2002)

A detailed description of the SEA process under the SEA-Directive can be found in the SEA Guidance⁹ of the European Union. This report will only describe the most important elements regarding the procedure and the integration of climate change consideration into the SEA process.

3.1 Screening

3.1.1 The process

The first step in the SEA process is the screening phase.

This is the assessment of the compulsory nature of the SEA for PP. Only those PPs that have significant environmental effects require an SEA. In order to decide whether an SEA is required, three phases should be followed, case by case:

Phase 1: To begin with, it should be verified whether the proposed plan or programme falls within the definition of 'plan or programme' as defined in the SEA-Directive.

⁹ SEA Guidance, Implementation of Directive 2001/42 on the assessment of the effects of certain plans and programmes on the environment. Commission's Guidance on the implementation of Directive 2001/42/EC.



The definition of a PP includes two conditions that must be fulfilled simultaneously (Article 2 (a)):

*“**plans and programmes**’ shall mean plans and programmes, including those co-financed by the European Community, as well as any modifications to them:*

- *which are subject to preparation and/or adoption by an authority at national, regional or local level or which are prepared by an authority for adoption, through a legislative procedure by Parliament or Government, and*
- *which are required by legislative, regulatory or administrative provisions.”*

According to the SEA Guidance the name ‘plan or programme’ is not a sufficiently reliable guide. Documents which meet the conditions of both indents in Article 2(a) may be found under a variety of names ('plan', 'programme', 'strategy', 'guidelines', etc.). MS should bear in mind that the SEA-Directive has a wide scope and broad purpose when they consider if a plan or programme falls within the scope of the Directive. The extent to which an act is likely to have a significant environmental effect may be used as a criterion.

Phase 2: Once defined a PP as determined in the SEA-Directive, there should be determined whether the PP falls under the scope of application of the SEA-Directive. If a PP falls under the scope of application this does not automatically mean that the PP requires an SEA.

The scope of application is subdivided in two categories (Article 3):

- 1) Plans or programmes which require an environmental assessment automatically. These plans and programmes are deemed likely to have significant environmental effects.
- 2) Plans or programmes which require an environmental assessment on the basis of a determination by Member States (so-called ‘screening’).

The following plans and programmes are not subject to the SEA-Directive:

- 1) Plans and programmes the sole purpose of which is to serve national defence or civil emergency;



Box 1: Are PPs to prevent floods due to increased storms and sea level rise as the result of climate change, a case of civil emergency?

According to the SEA Guidance, civil emergency includes events having a natural or man-made cause. Most of the floods can be seen as a civil emergency since they have a natural cause (e.g. storms, heavy rainfall). In the Directive itself there is no indication when such PPs should be drawn up, but their sole purpose must be to serve national defence or civil emergency. Following the European Court of Justice in case C-435/97 *WWF v Bozen*: Projects that are intended to safeguard national defence are the exclusion to the general rule laid down by the SEA-Directive that environmental effects are to be assessed in advance. This exclusion must accordingly be interpreted restrictively. Therefore only projects which mainly serve national defence purposes may therefore be excluded from that assessment obligation.¹⁰ As a result, PPs setting out measures to prevent the increase of flooding as the result of climate change (perhaps through the provision of infrastructure) will not fall within the exemption. On the other hand PPs setting out actions that should be taken if a flood occurs would be exempted from the Directive (SEA Guidance).

2) Financial or budget plans and programmes.

Phase 3: This phase determines for which PPs an SEA is mandatory. Note that an SEA may always be made on a voluntary basis. If necessary an investigation can be conducted to research the need to conduct an SEA (= screening), specifically if a proposed PP may have significant environmental impacts.

There are two kinds of categories of PPs. The ones that are SEA mandatory without any prior investigation on the significant environmental impacts and the ones that need

¹⁰ ECJ 16 September 1999, nr. C-435/97, *European Court Reports* 1999, I, 5613.



to undergo a screening procedure to assess if they are likely to have significant environmental effects.

First category: SEA mandatory

Those PPs that do not need prior investigation are presumed to have significant environmental impacts. The Directive deems these to have such effects. PPs under this category can be divided into two classes (Article 3(2)):

- 1) they are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning or land use and set the framework for the future development approval of projects listed in Annexes I and II to Directive 85/337/EEC;
- 2) they, in view of the likely effect on sites, have been determined to require an assessment pursuant to Article 6 or 7 of Directive 92/43/EEC (Habitat-Directive).

In the case of PPs for small areas at local level or minor modifications in the above classes, a prior investigation to determine if those PPs are likely to have significant environmental effects needs to take place (Article (3)).

Second category: screening

For those PPs setting the framework for future development approval of projects not covered by Article 3(2) a significant environmental effects assessment is required. This includes projects in sectors not included in Article 3(2) as well as projects which are in those sectors but are not listed in the annexes of the EIA-Directive or determine the use of small areas at local level or are minor modifications.

The SEA-Directive provides three screening mechanisms for a case-by-case assessment, specifying types of PP, or combining both approaches. Both screening mechanisms have their advantages. A case-by-case examination is best to take individual situations, and the characteristics of each plan or programme, into account. Specifying types of PPs has legal and administrative advantages since it is made clear from the start that an environmental assessment is necessary (SEA Guidance).



Annex II contains a non-exhaustive list of relevant criteria in order to ensure that PPs with likely significant effects on the environment are covered by this Directive. The criteria listed in Annex II are divided into two categories, one relating to the characteristics of the plan or programme and one relating to the effects and area likely to be affected. The criteria are not listed in order of importance. In general, it can be assumed that the greater the degree to which the criteria are met, the more likely significant effects on the environment will be seen.

1) The characteristics of PPs having regard, in particular, to

- the degree to which the PP sets a framework for projects and other activities, either with regard to the location, nature, size and operating conditions or by allocating resources;
- the degree to which the PP influences other plans and programmes including those in a hierarchy;
- the relevance of the PP for the integration of environmental considerations in particular with a view to promoting sustainable development;
- environmental problems relevant to the PP;
- the relevance of the PP for the implementation of Community legislation on the environment (e.g. plans and programmes linked to waste-management or water protection).

2) Characteristics of the effects and of the area likely to be affected, having regard, in particular, to

- the probability, duration, frequency and reversibility of the effects;
- the cumulative nature of the effects¹¹;
- the trans-boundary nature of the effects;
- the risks to human health or the environment (e.g. due to accidents)

¹¹ Effects on the environment that result from incremental changes caused by the strategic action together with other past, present, and reasonably foreseeable future actions. These effects can result from individually minor but collectively significant actions taking place over time or space. (Environmental Protection Agency 2008)



- the magnitude and spatial extent of the effects (geographical area and size of the population likely to be affected),
- the value and vulnerability of the area likely to be affected due to:
 - special natural characteristics or cultural heritage;
 - exceeded environmental quality standards or limit values;
 - intensive land-use;
 - the effects on areas or landscapes which have a recognised national, Community or international protection status.

In relation to mitigation, climate change has one of the most significant and complex cumulative effects. The accumulation of many actions, each of which has only a limited impact but all together cause serious effects. In that case it is very difficult to assess the significance of the effects of the PP on the environment (Environment Agency 2004). It is already a commonly used practice to include the effects of greenhouse gas emissions into an SEA. This report focuses on adaptation to climate change; hence it will not go further into detail on the mitigation issue.

In relation to adaptation, the characteristics - to determine if PPs are likely to have significant effects - show that:

- 1) PPs which set the framework for adaptation measures are likely to have significant effects since their *relevance for the integration of environmental consideration in particular with a view to promoting sustainable development*.
- 2) *Environmental problems* which are linked to PPs should be taken into account given that PPs can cause or exacerbate environmental problems, are constrained or otherwise affected by them, or contribute to solving, reducing or avoiding them. The impact climate change will have can be seen as an environmental problem. PPs which do not take into account climate change can aggravate climate change. PPs which take into account adaptation measures are also likely to be significant since they contribute to solving, reducing or avoiding the impacts of climate change. In any case it will be necessary to identify the nature and seriousness of climate change effects to PPs.



- 3) *Community legislation on the environment* should take into account. Directives which are relevant to the environment such as the Water Framework Directive¹², the Flood Directive¹³ and the Marine Strategy Framework Directive¹⁴. Preparation of plans related to these directives need to take into account climate change (European Commission 2009). PPs which are developed in the frame of these Directives are likely to have significant environmental effects.

Box 2. Question: Do PPs, which set a framework for coastal defence works, require an SEA?

In the light of climate change, and knowing that the risks of severe storms and flooding will increase in North-West Europe (IPCC 2007b), it is conceivable that national/regional and/or local governments will work out PPs to reduce the effects of coastal flooding. This is also stressed by the *White Paper on Adaptation* of the European Commission. MS need to put in place adequate adaptation actions that reduce the vulnerability to the impacts of climate change, such as flooding, and mandatory Adaptation Strategies should be developed by 2012.¹⁵ Moreover the establishment of flood risk management plans is required under the Flood Directive.¹⁶ According to the Flood Directive each flood risk management plan should include a summary of the measures and their prioritisation aiming to reduce the adverse consequences for human health, the environment, cultural heritage and economic activity associated with floods in the community (Article 1 and Annex). To assess flood risks, climate change also needs to be taken into account.¹⁷

The question arises whether PPs which set a framework for flood risk

¹² Directive 2000/60/EC of the European Parliament and the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, O.J. L. 327, 22 December 2000, 1-72pp.

¹³ Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks, O.J. L. 288, 6 November 2007, 27-34pp.

¹⁴ Directive 2008/56/EC of the European Parliament and the Council establishing a framework for community action in the field of marine environmental policy, O.J. L. 164, 22 June 2008, 19-40pp.

¹⁵ COM (2009) 147 final, White Paper: Adapting to climate change: Towards a European framework for action.

¹⁶ Article 7 of the Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks, O.J. L. 288, 6 November 2007, 27-34pp.

¹⁷ Article 7 of the Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks, O.J. L. 288, 6 November 2007, 27-34pp.



management, including coastal defence works, require an SEA. 'Set the framework' means that the PP contains conditions which guide the way the consenting authority decides on an application for development consent. Such criteria could place limits on the type of activity or development to be permitted in a given area, or they could contain conditions to be met by the applicant if permission is required, or they could be designed to preserve certain characteristics of the area concerned (SEA Guidance).

It is clear that the answer to this question will depend on the size of the works and the location.

Plans related to flood relief works in sites of community importance (SCIs) and special areas of conservation (SACs) according to the Habitat Directive¹⁸ or special protection areas (SPAs) under the Birds Directive¹⁹, must be considered as a plan not directly connected with, or necessary to the management of the site but likely to have significant effects. In this case an appropriate assessment will be required (Article 6 and 7 of the Habitat-Directive)²⁰. Hence an SEA will be required under Article 3(2)(b) SEA-Directive, if the PP also falls under the definition of a PP of the SEA-Directive.

PPs to manage flood risks in other coastal areas, are PPs prepared for water management and set the framework for future development consent of projects listed in Annex II of the EIA-Directive specifically, flood-relief works (f) and coastal works to combat erosion and maritime works capable of altering the coast through the construction, for example of dykes, moles, jetties, and other sea defence works, excluding the maintenance and reconstruction of such works (k). Hence PPs which set a framework for coastal defence works require

¹⁸ Article 7 of the Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks, O.J. L. 288, 6 November 2007, 27-34pp.

¹⁹ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds, O.J. L. 20, 26 January 2010, 7-25pp.

²⁰ Although such kind of provision is not explicitly mentioned in the Birds-Directive, SPAs also fall under the areas for which an appropriate assessment can be required according Article 7 of the Habitats-Directive which states that obligations arising under Article 6 (2), (3) and (4) of the Habitats-Directive shall replace any obligations arising under the first sentence of Article 4 (4) of the Birds-Directive in respect of areas classified pursuant to Article 4 (1) of similarly recognized under Article 4 (2) thereof.



an SEA, if the PP falls under the definition of a PP of the SEA-Directive.

Related to canalization and flood-relief works, the European Court of Justice in the case C-72/95 *Kraaijeveld*²¹ decided that the EIA-Directive has a wide scope and broad purpose. A MS exceeds the limits of its discretion if they establish the criteria or thresholds to determine which projects are to be subjected to an assessment in such a way that, in practice, projects are exempted in advance from the requirement of an impact assessment, without taking into account the significant effects on the environment. Dykes in order to prevent flood relief works should be seen as flood relief works and therefore fall under Annex II of the EIA-Directive. Furthermore modification to dykes (relocation, reinforcement or widening and replacement) is also subjected to an EIA under the EIA-Directive. In the follow up of this decision the EIA-Directive is amended in such a way that from 1997 on dykes are explicitly mentioned in the EIA-Directive Annex II (k).

3.1.2 Considering climate change adaptation in the screening process

The analysis of the process above shows that the screening phase examines whether the PP is subject to SEA by setting a range of conditions. Therefore this is the ideal phase to determine if climate change adaptation considerations should be included in the rest of the SEA-procedure. Consequently not all PPs should consider climate change adaptation into the SEA process. The first step should be to identify whether a climate lens has to be applied in more detail or whether no further climate change analysis will be needed. In order to do so it should be identified whether the PP is likely to significantly affect the ability to adapt to the effects of climate change in the area in the future, or if climate change will affect the ability to effectively implement the PP. Consequently the scope of the PP should justify considering climate change risks and vulnerability (OECD 2009a and the Scottish Government 2010).

²¹ ECJ 24 October 1996, nr. C-72/95, *European Court Reports* 1996, I, 5403.

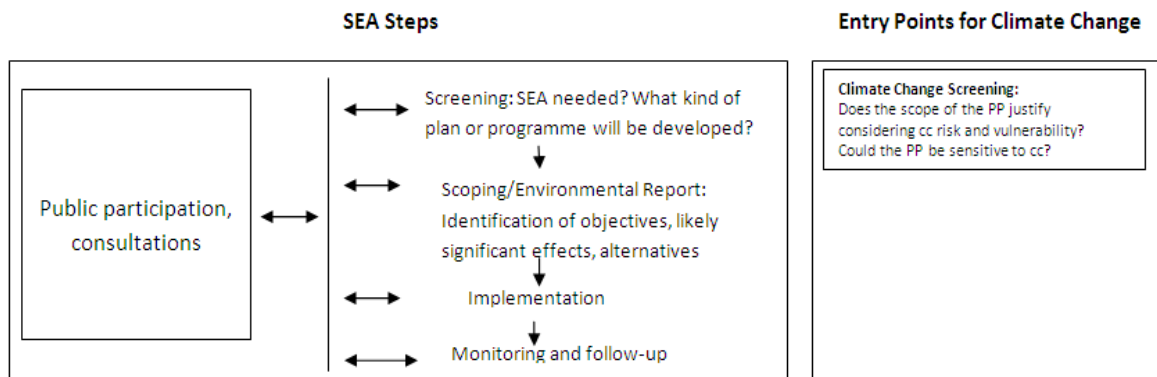


Figure 3. SEA procedural requirement and entry point in screening stage

Questions that can be asked are:

- Will the PP be affected by climate change?
- What is the duration of the PP?
- Will the PP influence adaptive capacity?
- Will the PP increase the vulnerability to climate change?
- In case of a national adaptation strategy, does the PP fits within this strategy and therefore need to be fully aligned to and consistent with this strategy?
- In case of a sectoral plan, how sensitive is the sector to climate change?
- Will the development activities of the PP be sensitive to climate change?
- Will the PP influence the location and design of new developments, critical infrastructure and public services which are taken in the light of adaptation to climate change?

Answering affirmatively to any of these questions outlined above, could be an indication that the PPs are likely to lead to significant effects, either positive or negative. The degree to which PP will be vulnerable to climate change, can determine the extent to which climate change has to be taken into consideration in the process of the PP.



3.2 Scoping

3.2.1 Process

Once determined that an SEA needs to be carried out, the next step is to identify the level of detail that needs to be included in the assessment, also called “problem identification” (Noble 2001). In the scoping phase, the range of environmental issues and the level of detail to be included in the environmental report are decided through consultation with the environmental authorities. MS laws can extend this participation to non-governmental organisations (NGOs) and the public in general, although this is not required by the SEA-Directive (Schmidt *et al.* 2005). Scoping the assessment issues entails the development of a reference framework for the assessment and provides a general overview of the issues and region in question (Noble 2001).

3.2.2 Considering climate change adaptation in the scoping process

The scoping phase determines issues that should be included in the environmental report. This ensures that the impacts of climate change affecting the PP are taken into account in the environmental report. At this stage it is relevant to ensure that climate change impacts are assessed in an appropriate way, including relevant adaptation measures dealing with these impacts, and a framework to assess the likely significant effects of the PP and the adaptation measures.

3.3 Environmental report

3.3.1 Process

The environmental report is seen as the main element of the SEA procedure and production of the report is mandatory. The environmental report assesses the likely significant effects on the environment of the PP. Furthermore it identifies, describes and evaluates reasonable alternatives taking into account the objectives and the geographical scope of the PP.

According to Annex I of the Sea Directive this environmental report includes: (i) contents, main objectives and relationship with other relevant plans and programmes, (ii) the relevant aspects of the current state of the environment (baseline) and the likely evolution thereof without implementation of the PP, (iii) relevant environmental



protection objectives, (iv) possible environmental impacts/likely significant effects, (v) measures to reduce the impacts, (vi) alternatives to meet the objectives, and (vii) prevention or mitigating measures.

Since the environmental assessment needs to be carried out during the preparation of a PP and before its adoption, the environmental report is seen as the central factor for the inclusion of environmental concerns/climate change in the PP. The following section 3.3.2 discusses how climate change concerns can be integrated in the environmental report.

Once the environmental report is developed, the environmental authorities, the public and, in case of transboundary effects, the authorities of the MS who are likely to be affected as well as the public of that MS must be consulted on the draft plans and on the environmental report. The initiators of the PP must take the findings of the report and the outcome of these consultations into account in further decision making. They can decide whether to adopt or modify the draft PP.

3.3.2 Considering climate change adaptation in the Environmental Report

Climate change concerns can be integrated in the Environmental Report in different stages.

Firstly “climatic factors” are seen as one of the likely significant effects on the environment that should be assessed in the environmental report (Annex I SEA-Directive). This means that mitigation to climate change, namely the assessment of greenhouse gas emissions and the effect this will have on the environment, explicitly need to be included in the environmental report. This can also be concluded from the report of the Commission on the application and effectiveness of the SEA-Directive²², in which it was stated that climate change issues are considered in SEA on a case-by-case basis, and mainly in relation to PP with a potential significant impact on climate, such as energy or transport PP.²³

²² COM(2009) 469 final, Report from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions on the application and effectiveness of the Directive on Strategic Environmental Assessment (Directive 2001/42/EC).

²³ An environmental assessment shall be carried out for plans and programmes which have likely significant effects on the environment (Art. 3 of the SEA-directive); Likely significant effects on the environment includes issues such as climatic factors (annex I, (f) of the SEA-directive).



Secondly, also related to climate change adaptation is the integration of the impacts/constraints set by climate change on the PP in the description of the baseline (Environment Agency, 2004). According to the SEA Guidance, the environmental baseline contains the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the PP. This is necessary for the understanding of how the PP could significantly affect the environment of the area in question. The term 'relevant aspects' refers to environmental aspects, including climate change aspects which are relevant to determine the likely significant environmental effects of the PP. The description of the likely evolution of the relevant aspects without the implementation of the PP is important as a frame of reference for the assessment of the PP. This requirement can be seen as corresponding to the so-called zero-alternative that is often applied in environmental impact assessment procedures. The description of the evolution should cover roughly the same time horizon as that envisaged for the implementation of the PP. Effects of other adopted PPs and decisions made that would affect the area in question, shall also be considered (SEA Guidance).

In light of climate change adaptation and the inclusion of the effects climate change will have on the PP, the description of the baseline should include an assessment of the impacts of climate change, relevant for the PP, without taking into account the effects the PP will have on these impacts. On the other hand existing climate change adaptation plans and measures should be taken into account, since this can be seen as an adopted plan that would affect the area. Consequently this step highlights possible conflicts with other existing regional/national plans and programmes. This is illustrated in the figure below.

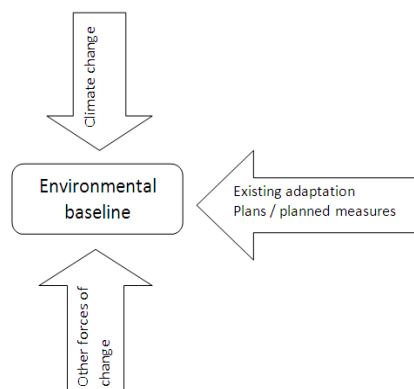


Figure 4. Environmental baseline and the inclusion of climate change concerns



This is also affirmed by the European Commission in the *Guidance document on the Common Implementation Strategy for the Water Framework Directive*, which states that the current and likely future should be described in the future climate change baseline. Furthermore, likely significant problems and constraints caused by climate change on the PP should be identified (European Commission 2009).

In the interests of proportionality it is important to tailor the approach for relevant baseline information. A comprehensive description of global climate change is unlikely to be of direct relevance for the assessment of many local level plans, but specific information about impacts on relevant sectors may provide an insight into the key aspects of climate change that the PP is likely to influence or be influenced by. This requires available and detailed scientific research on the impacts of climate change. In case such research is not available, this step will highlight gaps in knowledge and information (OECD/DAC 2008).

Thirdly, the environmental report should include the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment due to implementation of the plan or programme (Annex I SEA-Directive). There are several measures to minimise the adverse effects on climate change or to prevent climate change from happening; these are subsequently referred to as adaptation and mitigation measures respectively. Adaptation measures reduce climate change risks and improve the development outcomes of the PP. Therefore the environmental report should suggest plan alternatives to deal with key climate change related problems (European Commission 2009). According to the OECD/DAC Advisory Note on *Strategic Environmental Assessment and Adaptation to Climate Change*, adaptation measures need to be assessed on the basis of their feasibility, efficacy and acceptability, for example through stakeholder-driven multi-criteria assessments. It is important to assess whether the different adaptation options are robust under different climate change scenarios in order to ensure that they represent “no-regrets” interventions, particularly where climate change impacts are associated with high level of uncertainty (OECD/DAC 2008).

As already stated, once the environmental report is developed, the environmental authorities, the public and, in case of transboundary effects, the authorities of the MS who are likely to be affected as well as the public of that MS must be consulted on the draft plans and on the environmental report. This will raise public awareness on climate



change and its impacts, and involve other sectors or authorities impacted by climate change in the formation of the PP. The initiators must take the outcome of these consultations into account in the further decision making.

It can be concluded that the development of the environmental report creates a broader understanding of the potential effects the PP will have on adaptation to climate change, as well as the impacts that climate change will have on the implementation of the PP. Consequently adaptation measures to deal with climate change can be integrated in the SEA and thus in the development of the PP. Furthermore the roles of already existing PP and adaptation measures for the PP can be determined and taken into account in the establishment of the PP. In addition SEA can play a role in setting the climate change concerns on the planning agenda. (Vincente *et al.* 2006).

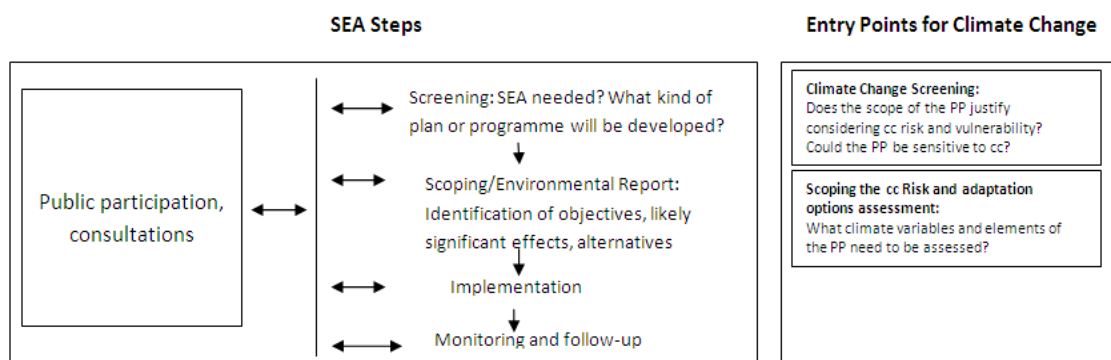


Figure 5. SEA procedural requirement and entry point in scoping stage and environmental report

3.4 Adoption and monitoring

3.4.1 Process

The comments of the public and the transboundary consultation need to be taken into account during the preparation of the PP and the environmental report, finally leading to the adoption of the PP. Regarding monitoring, the SEA Directive does not contain specific requirements, except that the significant environmental effects need to be monitored. Objectives and indicators are commonly used to assist with such monitoring. Objectives set the goals that the PP wants to reach unlike indicators, which measure a variable over time, used in measuring the achievement of objectives and targets. The relevant authorities and the public need to be informed on: the decision of



adoption, how SEA influenced the outcome of the PP and measures concerning monitoring.

3.4.2 Considering climate change adaptation in implementation and monitoring process

In this phase information available to the public will raise public awareness on the impacts of climate change.

With regards to monitoring and objectives indicators are commonly used. Climate change objectives could be to: reduce vulnerability of the impacts of climate change e.g. by taken a precautionary and risk-based approach to development in the floodplain, design buildings and urban areas to cope with new climate extremes, etc. Climate change indicators need to specifically contribute to measure climate change adaptation in a reasonable and realistic way.

Examples of climate change indicators can be found in the Scottish guidance document on the consideration of climatic factors within SEA (The Scottish Government 2010):

Potential effect on the PP	Possible Indicator
Positive contribution to climate change adaptation through ecological network enhancement.	Extent and characteristics of ecological networks that contribute to adaptation
Undermining/support for resilience to increase in precipitation, flood risk and flooding.	<p>Number or % of properties at risk of flooding in area</p> <p>% of new developments incorporating sustainable urban drainage</p> <p>Number or % of infrastructure at risk from flooding in area</p> <p>River flows and levels</p> <p>Water quality</p>

Figure 6. Examples of indicators

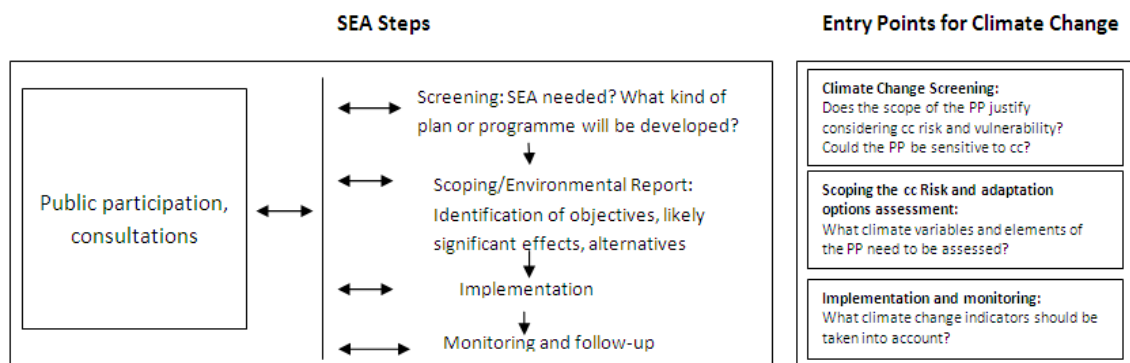


Figure 7. SEA procedural requirement and entry point in implementation and monitoring process



4. SEA and adaptation strategies

According to the definition of a PP, along with the wide scope and broad purpose of an SEA, some adaptation strategies can require an SEA. Such an SEA would be required if the adaptation strategy is more than a general guideline and has direct effects, since it needs to set the framework for future projects (Schmidt *et al.* 2005). Nevertheless, the respective strategy-maker can always subject the strategy to an SEA on a voluntary basis. Furthermore Member States can open the transposition of the SEA-Directive to strategies, following the example of Scotland (Environmental Assessment (Scotland) Act 2005)²⁴. Moreover the analysis of the criteria for the determination of the likely significance of effects on the environment, listed in annex II of the SEA-Directive, is covered by the Directive. This analysis has shown that PP's, which take into account adaptation measures, are likely to be significant because they contribute to solving, reducing or avoiding environmental problems namely impacts of climate change.

There must be noted that other criteria of the SEA-Directive also must be met (e.g. prepared by an authority, required by legislative and regulatory or administrative provisions).

Consequently requiring an SEA will depend on the level of detail of the adaptation strategy. If this just describes the general framework of the effects of climate change on a region or country to build understanding, knowledge and capacity, an SEA will not be required. If, on the other hand, the adaptation strategy would set detailed guidelines, and set the framework for adaptation measures to be taken, the adaptation strategy may cause significant environmental effects and an SEA would be required. The Scottish adaptation process is a good example for this approach.

The Climate Change (Scotland) Act²⁵ outlines the development of programmes for both mitigation and adaptation.

The first programme for adaptation was 'Adapting Our Ways: Managing Scotland's Climate Risk'²⁶. This programme was the first step in the development of a Scottish adaptation strategy. It was also the first stage of a consultation process towards the development of that strategy. Its main purpose was to engage with stakeholders and

²⁴ Act of the Scottish Parliament (asp 15), came into force on 20 February 2006.

²⁵ Act of the Scottish Parliament (asp 12), received Royal Assent on 4th August 2009.

²⁶ The Scottish Government, 2008a. Adapting Our Ways: Managing Scotland's Climate Risk, Edinburgh, 67pp. Available at: <http://www.scotland.gov.uk/Resource/Doc/228959/0061976.pdf>



seek their view on proposed strategic principles and priority actions. Because of this purpose, it did not set detailed guidelines for specific plans, programmes and strategies, so therefore an SEA was not required (The Scottish Government, 2008b). The second and third programme for adaptation was “*Scotland’s Climate Change Adaptation Framework*”, including the corresponding sector summaries,²⁷ and “*Climate Change Adaptation Framework Sector Action Plans*”²⁸. Both programmes were SEA mandatory since they set high level strategic principles and actions which may have influence all areas of government work and beyond, which, in turn, is likely to have a significant environmental impact. The SEA procedure for “*Scotland’s Climate Change Adaptation Framework*” and the corresponding sector summaries was completed and the Framework was published in December 2009²⁹. The SEA procedure for the “*Climate Change Adaptation Framework Sector Action Plans*” is still pending and is now in the scoping phase.³⁰

It can be noted that the process to develop adaptation strategies and the process to include climate change adaptation considerations into the SEA show similarities. According to Ludwig *et al* (2009) the steps within coastal adaptation strategies are:

- 1) Select one or a set of climate change projections;
- 2) Evaluate the impact of these projections;
- 3) Define adaptation measures;
- 4) Determine the effectiveness of these measures;
- 5) Implement the measures;
- 6) Monitor the measures ;
- 7) Engage stakeholders in the above mentioned actions.

²⁷ The Scottish Government, 2009. Scotland’s Climate Change adaptation framework, Edinburgh, 34pp. Available at: <http://www.scotland.gov.uk/Resource/Doc/295110/0091310.pdf>

²⁸ See: <http://www.scotland.gov.uk/Topics/Environment/SustainableDevelopment/14587/SEAG>

²⁹ The environmental report is available at:

<http://www.scotland.gov.uk/Topics/Environment/climatechange/scotlands-action/adaptation/AdaptaitonFramework/DevelopmentofFramework/SEAadaptationframework>

³⁰ See: <http://www.scotland.gov.uk/Topics/Environment/SustainableDevelopment/14587/SEAG>



Raising public awareness during the planning process is also seen as an important element of a coastal adaptation strategy, in order to avoid the risk of public opposition and an impediment to the implementation of the plan (Klein *et al.* 1999).

These steps also play an important role in the inclusion of climate change adaptation considerations into the SEA process. For instance at the screening phase, which assesses if the PP is sensitive to climate change, the climate change projections and the impact of these projections on the PP need to be assessed and taken into account. In the writing phase of the environmental report, measures to cope with the environmental impacts, climate change and impacts of climate change on the environment without implementing the PP, need to be determined and evaluated. At the end the PP needs to be implemented and monitored, specifically the effectiveness of the PP to deal with the environmental effects needing to be assessed. Public participation is also a crucial element of an SEA and can contribute by raising awareness regarding climate change. Therefore the SEA process should be integrated into the development of adaptation strategies. This is also recommended by Ribeiro *et al.* (2008) and the Secretariat of the Convention on Biological Diversity (2003). Consequently an SEA can be seen as a useful tool to evaluate the environmental impacts of adaptation strategies as well as to highlight possible conflicts with other existing regional/national PP.



5. International and European intentions and progress on incorporating climate change impacts and adaptation in an SEA

5.1 Espoo convention

Under the auspices of the United Nations Economic Commission for Europe (UNECE) the Espoo Convention was adopted on 25 February 1991. The Espoo Convention³¹ entered into force on the 27 June 1997. The Convention originally dealt with an EIA in a transboundary context. In 2003 the convention was augmented to a higher level, by the adoption of the SEA Protocol to the Espoo Convention³². The SEA protocol entered into force on 11 July 2010. The Convention and the Protocol were both influenced by international attention for sustainable development as well as the European legal developments that dealt with procedural environmental provisions, namely the EIA-Directive and the SEA-Directive. It must be said that the Espoo Convention and the protocol in turn influences the European legislation. For example in the original EIA-Directive no provision could be found for affected people in other countries to participate in the consultation process. Due to the ratification of the Espoo Conventions the principle of transboundary cooperation has been implemented in the amended EIA-Directive (Marsden 2008). The Convention specifies the procedural rights and duties of Parties with regard to transboundary impacts of proposed plans and programmes and provides procedures in a transboundary context for the consideration of environmental impacts in decision-making. This is of a high importance in light of climate change since it is accepted that the effects of climate change will not stop at the border and therefore in case of transboundary impacts a common approach needs to be developed.

According to the UNECE, the SEA can be an effective tool for climate change adaptation and mitigation, by introducing climate change considerations into development planning. The conclusions of the Intergovernmental Panel on Climate Change (IPCC) stated that consideration of climate change impacts at the planning stage is key to boosting adaptive capacity (UNECE 2010).

³¹ Convention on Environmental Impact Assessment in Transboundary context of 25 February 1991, Espoo, B.S. 31/12/1999.

³² Protocol on Strategic Environmental Assessment of 21 May 2003, Kiev.



5.2 Convention on Biological Diversity

The Convention on Biological Diversity (CBD)³³ entered into force on 29 December 1993. According to Article 1 it has 3 main objectives:

- 1) The conservation of biological diversity;
- 2) The sustainable use of the components of biological diversity; and
- 3) The fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

Article 14 of the CBD explicitly refers to SEA:

“Each Contracting Party, as far as possible and appropriate, shall:

(b) Introduce appropriate arrangements to ensure that the environmental consequences of its programmes and policies that are likely to have significant adverse impacts on biological diversity are duly taken into account.”

According to the Secretariat of the CBD, the EIA and the SEA are useful tools to assess the economic, environmental and social implications of different climate-change-mitigation and adaptation activities (projects and policies) within the broader context of sustainable development. EIA and SEA can be integrated into the design of climate change mitigation and adaptation projects and policies to assist planners, decision-makers and all stakeholders to identify and mitigate potentially harmful environmental and social impacts and enhance the likelihood of positive benefits such as carbon storage, biodiversity conservation and improved livelihoods. EIAs and SEAs can be used to assess the environmental and social implications of different energy and land-use, land-use change and forestry (LULUCF) projects and policies undertaken by parties to the UNFCCC and the CBD (Secretariat of the CBD 2003).

At the 6th Conference of the Parties (COP) guidelines for incorporating biodiversity-related issues into EIA legislation and/or process and into SEAs were adopted.³⁴ However these guidelines only make reference to incorporating biodiversity and the ecosystem approach in SEA without mentioning climate change.

³³ Convention on Biological Diversity of 5 June 1992, Rio de Janeiro, B.S. 02/04/1997.

³⁴ Sixth Meeting of the Conference of the Parties to the Convention on Biological Diversity, the Hague, Netherlands, 7 - 19 April 2002, decision VI/7.



5.3 The European Union

In 2007 the *Green Paper on Adaptation* stated that climate change proofing must be integrated into the EIA-Directive and SEA-Directive as policy impact assessments had to address impacts on ecosystems³⁵. The *White Paper on Adaptation*³⁶ which was the outcome of the Green Paper and its consultation rounds, stated that the Commission would work out guidelines together with Member States and stakeholders to ensure that climate change impacts were taken into account when implementing EIAs and SEAs by 2011. Mainstreaming climate change adaptation into EU policies is one of the phases to improve the EU's resilience to deal with the impact of climate change. In the follow-up of this statement the European Commission launched a wide public consultation in relation to review EIA legislation in June 2010. In August of the same year, the Committee of the Regions gave its opinion on improving the EIA and SEA Directives. They also stated that both directives should contain a well-established methodology to determine the impacts of climate change.³⁷ All these findings will feed a review of the EIA in 2011. This review should culminate with a new text that will also encompass new policy developments such as sectors of climate change, energy and biodiversity.³⁸ It is likely that guidance on how to integrate climate change adaptation concerns in the SEA-Directive will follow later. This is highly recommended to encourage Member States to make their planning process more 'climate proof'.

5.4 The Habitats-Directive and Birds-Directive

With the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats-Directive)³⁹, adopted in 1992, and the Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds (Birds-Directive),⁴⁰ the

³⁵ COM (2007) 354 final, Green Paper from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: Adapting to climate change in Europe – options for EU action.

³⁶ COM (2009) 147 final, White Paper: Adapting to climate change: Towards a European framework for action.

³⁷ Opinion of the Committee of the Regions on Improving the EIA and SEA Directives (2010/C 232/07) OJ. L. 232/41.

³⁸ Opinion of the Committee of the Regions on Improving the EIA and SEA Directives (2010/C 232/07) OJ. L. 232/41.

³⁹ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, O.J. L. 206, 22 July 1992, pp 07-50.

⁴⁰ Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds, O.J. L 103, 25/04/1979, 1-26pp. As amended by the Directive 2009/147/EC of 30 November 2009, O.J. L. 20, 26/01/2010, 7-25pp.



European Union met its obligations under the Bern Convention⁴¹ and the CBD⁴². They went further by creating an even more detailed framework for site conservation and protection than was promoted by these conventions. The main aim of the Habitats Directive is to promote the maintenance of biodiversity by requiring MS to take measures to maintain or restore natural habitats and wild species at a favourable conservation status, introducing robust protection for those habitats and species of European importance. In applying these measures MS are required to take note of economic, social and cultural requirements, as well as regional and local characteristics. The Birds-Directive on the other hand provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. It sets broad objectives for a wide range of activities, although the precise legal mechanisms for their achievement are at the discretion of each MS.

According to Article 3(2)(b) of the SEA-Directive, a PP which, in view of the likely impact on site requires an assessment pursuant to Article 6 or 7 of the Habitat-Directive, mandatorily requires an SEA. This means that all the PP that require an Article 6 assessment are covered by the SEA Directive. Consequently any PP that is not directly connected with, or necessary to the management of an SCI, SPA or SAC, but likely to have a significant effect thereon, shall be subjected to an appropriate assessment of its implications for the site in view of the site's conservation objectives. As stated by the European Commission, the assessments required by Article 6 should be clearly distinguishable and identified within the SEA or reported separately (European Commission 2002). The national authorities can only agree to the plan or project after having ascertained that it will not adversely affect the natural features of the site concerned and after having provided opportunities for participation if necessary (Article 6(3) Habitats-Directive). A possible exception is provided in Article 6(4) of the Habitats-Directive: a plan or project may nevertheless be carried out, in spite of a negative assessment of the implications for the site, if certain conditions are met:

- 1) No alternative solutions should be available;
- 2) It should concern imperative reasons of overriding public importance, including reasons of a social or economic nature; and

⁴¹ Convention on the Conservation of European Wildlife and Natural Habitats of 19 September 1979, Bern, B.S. 29/12/1990.

⁴² Convention on Biological Diversity of 5 June 1992, Rio de Janeiro, B.S. 02/04/1997.



- 3) The MS should take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. Natura 2000 is a coherent European ecological network of SCIs, SPAs and SACs.

Compensatory measures can consist of: recreating a habitat on a new or enlarged site, improving a habitat or in exceptional cases, proposing a new site under the Habitats-Directive (European Commission 2002). Adaptation measures such as safety measures against flooding to protect housing and coastal infrastructure can fall under the definition of overriding public interest. If a plan or project is allowed within Natura 2000 sites, compensation measures have to be taken. This compensation needs to be active, meaning that compensation must be realised before the negative effects of a plan or project take place (European Commission 2000). The Commission should be informed of the compensatory measures adopted (Article 3 Habitats-Directive).

According to the European Court of Justice in case C-172/02 '*Cockle fisheries in the Wadden Sea*'⁴³, a PP is likely to have significant effects on SCIs, SPAs or SACs if the PP is likely to undermine the site's conservation objectives. The assessment of that risk must be made in the light inter alia of the characteristics and specific environmental conditions of the site concerned by such a plan or project. An appropriate assessment of the implications of the plan or project for the site concerned, prior to its approval, should cover all the aspects of the plan or project which can, by themselves or in combination with other plans or projects, affect the site's conservation objectives. These objectives of the plan or project need to be identified in light of the best scientific knowledge in the field. In applying the precautionary principle the Court decided that if, on the basis of objective information, a risk of likely significant effect cannot be excluded, the plan or project will have significant effects on the site concerned. In case of doubt as to the absence of significant effects such an assessment must be carried out. This makes it possible to ensure effectively that plans or projects which adversely affect the integrity of the site concerned are not authorised. This contributes to achieving, in accordance with the third recital in the preamble to the Habitats Directive and Article 2(1) thereof, its main aim, namely, ensuring biodiversity through the conservation of natural habitats and of wild fauna and flora. This was the case with shellfish fisheries in SPA Wadden Sea, since scientific research revealed that the decline of shellfish-eating birds was caused by different factors such as fisheries but

⁴³ ECJ 7 September 2004, Case C-127/02, *Cockle Fisheries*.



also some of which are beyond immediate human control, such as climate change and invasive species (Verschuuren 2005). Hence the fact that climate change will put additional pressure on SCIs, SPAs and SACs must be taken in consideration in the appropriate assessment on the likely significant effects next to the likely significant effects the PP will cause by itself.

5.5 Water Framework Directive and Flood Directive

The EU Water Framework Directive 2000/60/EC⁴⁴ (WFD) and Flood Directive 2007/60/EC⁴⁵ are part of the European Water Policy. They established a legal framework to protect and restore the water environment across Europe and mitigate the effects of flooding.

MS are obliged, through the WFD, to achieve a 'good water status' by 2015 and ensure the long-term sustainable use of water resources. River basin management plans (RBMPs) should be established containing concrete measures to achieve such a status. Public participation and regular review (every six year) are essential elements to the process. The Flood Directive obliges MS to undertake a preliminary flood risk assessment by 2011. Flood hazard maps and flood risk maps need to be completed by 2013 and in conjunction with the RBMPs of the WFD, flood risk management plans (FRMP) need to be established by 2015. FRMPs shall address all aspects of flood risk management focusing on prevention, protection and preparedness. Given that climate change will put additional pressure on the European water resources and flooding will occur more frequently, several existing EU initiatives under the European Water Policy should contribute to efforts of adaptation to climate change. Since the key procedural requirement of the WFD and Flood Directive is the preparation of RBMPs and FRMP, climate change should be comprehensively considered in the different steps of the WFD and Flood Directive planning and implementation. The second RBMPs due in 2015 and the FRMP need to take account of medium and long-term implications of climate change and thus be designed to be robust to the impacts of climate change and climate variability (European Commission 2009).

⁴⁴ Directive 2000/60/EC of the European Parliament and the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, O.J. L. 327, 22 December 2000, 1-72pp.

⁴⁵ Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks, O.J. L. 288, 6 November 2007, 27-34pp.



The European Commission stated in the *Common Implementation Strategy for the WFD* that: SEA, either alone or as part of a sustainability appraisal, can help to ensure that PP take full account of climate change issues (European Commission 2009). Potential SEA climate change objectives related to adaptation and the European Water Policy could include measures such as:

- Ensuring that drainage systems can cope with changing rainfall patterns/intensity;
- Taking a precautionary and risk-based approach to developing in the floodplain;
- Ensuring adequate future water supply and demand management;
- Avoiding actions that limit future adaptation.

Both the preparation of the RBMP and the FRMP fall under the remit of the SEA Directive and thus trigger the application of SEAs during the planning process⁴⁶. The WFD and Flood Directive advocate the integration of its requirements, which relate to improving water quality and reduce flood risks, into other EU and domestic policies within the MS. Land use planning is a key area where this should take place. There already exists an early and important opportunity to integrate the ethos of the WFD and Flood Directive within planning systems via assessment procedures undertaken during the preparation of land use plans, which are also covered by the SEA Directive. This would enable significant problem areas concerning water quality and floods to be identified, and for land use plans to consider the requirements of the WFD and Flood Directive during their preparation. Subsequently land use planning policies could be developed encouraging the protection of the water environment and reduce flood risk (Carter *et al.* 2006).

5.6 Organisation for Economic Cooperation and Development (OECD)

The OECD is a multi-disciplinary inter-governmental cooperation organisation established in 1961. Today, it comprises 33 member countries along with European Commission. The OECD provides a setting where governments compare policy

⁴⁶ RBMPs and FRMP constitute a type of plan that is likely to have significant environmental effects and Article 3 of the SEA Directive, which defines its scope, specifically states that plans and programmes in the field of water management should be subject to an assessment.



experiences, seek answers to common problems, identify good practice and coordinate domestic and international policies. Furthermore the OECD shares expertise and exchanges views with more than 100 other countries. The OECD has been working on climate change economics and policy since the late 1980s. In relation to adaptation, the OECD works closely with governments to integrate adaptation to climate change into all relevant policy areas. Recent OECD work on adaptation has focused on three main streams of work: economic aspects of adaptation, integrating adaptation in development cooperation and adaptation in domestic OECD contexts (OECD 2009b). In light of its work to integrate adaptation in development cooperation, the OECD published an Advisory Note on SEA and adaptation to climate change (OECD/DAC 2008). The afore-mentioned Advisory Note aims to demonstrate how SEA facilitates the integration of climate change adaptation considerations into planning and decision-making.

Box 3. Integration of climate change adaptation in PPP at different levels

At national level:

SEA may help to identify elements of national PPPs that are sensitive to or at risk of climate change or whose viability in the context of projected future climatic conditions are in question.

At sectoral level:

Climate change considerations within an SEA might be used to assess strategies for sectoral reforms to identify which strategies are, and which are not, resilient under different climate change scenarios, or to identify where adaptation interventions will be required to enhance the resilience of the sector in the face of climate change. For example, in areas with increasing water stress, the water requirements associated with different strategies for reform of the agricultural sector may determine which sectoral PPPs are most practical and sustainable in different climate change scenarios. In the tourism sector, the viability of different strategies and associated PPPs for the expansion of coastal tourism might be assessed for different rates and magnitudes of sea-level rise.



Source: OECD/DAC, 2008. Strategic Environmental Assessment and Adaptation to Climate Change. OECD Publications, 29pp.

The Advisory Note states that not all SEAs should include climate change considerations, only those PPPs that are likely to be influenced by climate change, and hence need to adapt or influence adaptive capacities in some way to integrate climate change considerations into the SEA process. In order to do so, a climate lens can be adopted. A climate adaptation lens is an analytical process/step/tool to examine a PPP. The main part of the Advisory Note sets key questions which should be asked in the process of integrating climate change considerations into an SEA, especially in the first scoping phase and the second implementation phase. This Advisory Note is very useful for MS to adapt their existing legally embedded SEA process to incorporate climate change adaptation. Given that the OECD already elaborated a report on “*Incorporating climate change impacts and adaptation in environmental impact assessments*” from Argawala *et al.* (2010), it is still likely that the OECD will elaborate a specific report on incorporating climate change considerations in SEAs as well.



6. National intentions and progress on incorporating climate change impacts and adaptation in SEA

6.1 The Netherlands

In the Netherlands, the SEA procedure is regulated by the Dutch Environmental Management Act (WMB)⁴⁷ and the Environmental Impact Assessment Decree 1994 (Besluit m.e.r. 1994)⁴⁸. In June 2010 the Besluit m.e.r. was amended due to the judgement of the European Court of Justice, since the Netherlands failed to adopt the necessary measures to correctly implement the EIA-Directive, especially related to the implementation of Article 4 (2) and (3)⁴⁹. According to the WMB, the Commission for Environmental Impact Assessment is the competent institution to give advice on the environmental reports.⁵⁰ The Commission published a report on the necessity to integrate climate change considerations in an SEA and on how this must be achieved⁵¹. Climate change will make it essential to change the time horizon of existing plans, and especially spatial plans. In order to establish a climate proof policy in the Netherlands, a time horizon of 20, 50, and even 100 years should be taken into account depending on the plan. Consequently it's useful to take climate change considerations into account in the preparation of a plan and hence in the existing SEA procedure. Therefore a specific section on climate change should be included into the environmental report. Climate change adaptation only needs to be integrated into the plan depending on the climatic effects and the associated risks, the nature of the area, and the ratio between the cost on the short term and perceived long term-costs of the plan. Accordingly, if decided that the plan should take into account climate change adaptation considerations, the environmental report should cover (Draaijers *et al.* 2008):

- How best to respond to the impacts of climate change: how to control the risk while the quality of life, environmental quality and safety can be maintained or

⁴⁷ Dutch Environmental Management Act, 13 July 1979, stb. 1979, 442.

⁴⁸ The Environmental Impacts Assessment Decree 1994 as amended by the Environmental Impacts Assessment Decree 16 June 2010, stb. 2010, 9096.

⁴⁹ Article 4 (2) states that for projects listed in Annex II the MS must determine through a case- by- case examination or thresholds or criteria set by the MS whether the project shall be made subject to an assessment. In order to do so the MS need to take into account the selection criteria listed in Annex III (Article 4 (3)). In the besluit m.e.r. 1994 the only criteria which was taken into account was the 'size of the project' this was not in accordance with the purpose of Annex III of the EIA-Directive. ECJ 15 October 2009, nr. C-255/08, O.J. 2009, C 297/11.

⁵⁰ Article 2.17 of the Dutch Environmental Management Act, 13 July 1979, stb. 1979, 442.

⁵¹ Commissie voor de milieueffectenrapportage: Factsheet nr.2 Klimaat en m.e.r., 2pp.



increased. Or else, which adaptation measures will be taken to mitigate the effects of climate change;

- Assessment of the plan: if it doesn't lead to maladaptation, interferes with planned adaptation measures or decreases the effects of climate change;
- The possibility to combine adaptation measures with other measures not specifically related to climate change to achieve 'no-regret' measures⁵².

In order to describe these issues, the plan-maker of the environmental report can rely on the climate change scenarios as determined by the Royal Netherlands Meteorological Institute and apply the guiding principles of the National adaptation strategy of the Netherlands.

The thoroughness of the in depth study on these issues will be influenced by the effect climate change will have on the specific plan. Plans which include structural concepts are more likely to be affected by the effects of climate change than small scale plans (Draaijers *et al.* 2008).

6.2 Ireland

The requirements of the SEA-Directive are translated into Irish Law by the Planning and Development (Strategic Environmental Assessment) Regulation 2004⁵³. This regulation is accompanied by guidelines for regional and planning authorities, issued by the Department of Environment, Heritage and Local Government (Government of Ireland 2004). Herein only a small reference is made to climate change adaptation. In light of taking into account environmental protection objectives and environmental considerations in the environmental report, it states that adaptation to climate change impacts needs to be assessed, planned and managed, although only when this would be relevant for the plan. There is no guidance given on how to assess the relevance between climate change adaptation and the plans, nor on how this needs to be integrated into the environmental report. Furthermore climate change is mentioned as a possible direct effect on the environment under the notion climatic factors (Government of Ireland 2004).

⁵² Commissie voor de milieueffectenrapportage: Factsheet nr.2 Klimaat en m.e.r., 2pp.

⁵³ S.I. No 436/2004 – Planning and Development (Strategic Environmental Assessment) Regulations 2004.



6.3 Belgium

Due to the division of competences within Belgium, the SEA-Directive is translated in Federal and Region law. At Federal level the legal framework for SEA can be found in the Law of 13 February 2006 concerning the assessment of the impacts on the environment of certain plans and programmes and public participation in the preparation of plans and programs related to the environment.⁵⁴ A special advisory committee under the Federal Public Service Health, Food Chain Safety and Environment has been put into place with a genuine investigatory function. In Flanders the legal framework for SEA can be found in the Decree of 19 April 1995 concerning the general stipulations related to environmental policy⁵⁵. Under the Department of the Environment, Nature and Energy a special cell related to environmental impact assessment (MER-cel) has been established which develops guidance documents on several themes (e.g. procedural aspects, water, soil, etc.). Up to now no guidance document has been released on the integration of climate change adaptation concerns into SEA.

6.4 United Kingdom

In the United Kingdom (UK) the Regulations on Environmental Assessment of Plans and Programmes of 2004 regulate the framework of SEA. These Regulations are the implementing legislation for the SEA-Directive in UK within the different regions (e.g. England, Northern Ireland, Scotland and Wales)⁵⁶.

Specifically for Scotland, additional legislation was put into place by the Environmental Assessment (Scotland) Act 2005 (2005 Act)⁵⁷ since the Scottish Government is the competent authority to implement the SEA-Directive in the Scottish region. However,

⁵⁴ Law of 13 February 2006 concerning the assessment of the impacts on the environment of certain plans and programmes and public participation in the preparation of plans and programs related to the environment, *B.S.* 10/03/2006.

⁵⁵ Decree of 19 April 1995 concerning the general stipulations related to environmental policy, *B.S.* 4/07/1995, as amended by the Decree of 18 December 2002, *B.S.* 13/02/2003.

⁵⁶ S.I. No 1633/2004 Environmental Assessment of Plans and Programmes Regulation 2004 (England); S.I. No 280/2004 Environmental Assessment of Plans and Programmes Regulation 2004 (Northern Ireland); S.I. No 258/2004 Environmental Assessment of Plans and Programmes Regulation 2004 (Scottish Statutory Instrument); S.I. No 1656/2004 Environmental Assessment of Plans and Programmes Regulation 2004 (Welsh Statutory Instrument).

⁵⁷ Act of the Scottish Parliament (asp 15), came into force on 20 February 2006.



UK Regulations remain in force for certain UK-wide plans and programmes, regulated by the Environmental Assessment of Plans and Programmes Regulations 2004. Similar to the Netherlands, the Environmental Team of the Scottish Government published a guidance document on how plan-makers can integrate climate change adaptation considerations into the SEA-process (The Scottish Government 2010). Like the Netherlands, the plan-makers can rely on national climate change information/scenarios, namely the UK Climate Projections (UKCP), which gives predictive information on the changing climate (e.g. precipitation) to assess the effects of climate change on the plans, programmes and strategies (PPS). According to the *Guidance document* and the *SEA Tool Kit*, the inclusion of mitigation and adaptation considerations into an SEA derive from the fact that the 2005 Act includes 'climatic factors' within the wide spectrum of environmental issues to be considered when undertaking an SEA (Natural Scotland Scottish Executive 2006 and The Scottish Government 2010).

Furthermore a guidance document on *Strategic Environmental Assessment and Climate Change: Guidance for Practitioners* was published by Levett-Therivel in 2004(revised in 2007) by demand of the countryside council for Wales, The Environment Agency, The UK Climate Impacts Programme, Natural England, IteREAM and CAG consultants. This guidance document suggests how climate change can be considered in SEA in England and Wales (Levett-Therivill 2007). According to the guidance document both mitigation and adaptation measures must be considered in SEA. Firstly, a brief overview is given of the effects of climate change in the UK. Secondly, guidance is given on how to integrated climate change mitigation and adaptation into the SEA process. Thirdly, some climate change indicators, information sources and objectives are listed. Finally, examples of existing plans and their link to adaptation and mitigation are expounded.

Finally a comment has to be made on SEA and Shoreline Management Plans (SMPs), since this is the commonly used tool within the UK to organise coastal defence and heralded a new approach to coastal defence. SMPs attempt to coordinate activities between coastal authorities and address conflicts between competing interests in the coastal zone. The strength of these SMPs lies in the fact that numerous organisations are involved: maritime operating authorities, Department for the Environment, Fisheries



and Rural Affairs (Defra), the Environment Agency, port and harbour authorities, English Nature etc.

SMPs help to build an understanding of the physical processes operating along the coast (historic coastline changes, the geomorphic response to prevailing wave and tidal conditions, sediment transport and characteristics), to set this within the context of existing land use and to develop policy options for long term future coastal flood risk, and shoreline management. The main objective of SMPs is to provide technically, environmentally and economically sound and sustainable defence measures (Barter *et al.* and Defra 2006b).

The Department for the Environment, Fisheries and Rural Affairs of the UK published policy guidance on how to develop SMPs. The first guidance document dates from 1995 and updates were published in 2001 and 2006. The first update recommended that options should be appraised over a 100-year horizon, rather than 50 years, taking into account climate change. Policy options identified for shoreline management and flood risk prevention are: hold the line, advance the line, managed realignment and no active intervention (Defra 2006a).

Related to environmental assessment, the Guidelines of 2001 advised that the SMPs do not require an SEA, nor an appropriate assessment under Article 6(3) of the Habitats-Directive since these plans do not authorise development and planning permissions which must be obtained for development projects. The new guidelines of 2006 explicitly stated that SMPs need to carry out an SEA and were necessary an appropriate assessment under Article 6(3) of the Habitats-Directive. This is due to a conviction of the UK by the European Court of Justice in case C-6/04 *Commission of the European Communities v UK and Northern Ireland*⁵⁸. The ECJ stated that *“although land use plans do not authorise development and planning permission must be obtained for development projects, they have great influence on development decisions and the sites concerned”*.

⁵⁸ ECJ 20 October 2005, nr. C-6/04.



7. Advantages of applying an SEA and integrating climate change adaptation considerations

Firstly, an SEA provides a framework for influencing decision-making at an earlier stage when PPs, which give rise to individual projects, are being developed. It should lead to more sustainable development, since it will affect decision-making more than EIA does. Furthermore it will also assess a wider range of options and can deal with a higher level of uncertainty by using different scenarios. Consequently the integration of climate change adaptation considerations into the SEA process will even more enhance sustainable planning and in addition avoid the risk of maladaptation.

Secondly, the process of SEA will identify PPs that are sensitive to climate change and therefore provide decision-makers with better information on the impacts of climate change and alternatives to deal with climate change. It will improve good governance and public trust in policy making in the light of climate change.

Thirdly, a good integration of climate change adaptation into SEA would mean that other relevant PPs such as adaptation strategies or sectoral adaptation plans, which can influence the PPs need to be taken into account in the development of the PPs and will lead to mainstreaming PPs and thus in return will avoid the risk of maladaptation.

Finally, it is argued that the integration of climate change adaptation considerations in the SEA process can change established routines and enable attitudes and perceptions to change as a result of participation in a transparent and systematic process leading to increased climate change awareness and raising awareness of the environmental impacts of plans.



Conclusion

One can conclude that a Strategic Environmental Assessment (SEA) is a useful tool to facilitate decision-making in the light of climate change adaptation. An SEA addresses problems and promotes actions on adaptation to climate change into the planning process, and can evaluate the environmental impacts of adaptation strategies as well as highlight possible conflicts with other existing regional/national plans and programmes.

First the study on the rationale of SEA has shown that climate change adaptation considerations need to be integrated in the tool. This will lead to more sustainable planning, one of the main objectives of an SEA, and to avoid maladaptation. Moreover, it will ensure that impacts with a higher level of uncertainty such as climate change are taken into account in the development of the plan or programme.

Furthermore, the study has identified several entry points to include climate change adaptation considerations in the procedural requirements of an SEA. At the screening phase it can be assessed whether the scope of the plan or programme justifies considering climate change risk and vulnerability by investigating if the plan or programme is climate change sensitive. In the scoping phase it can be determined what climate change variables and elements of the plan or programme need to be assessed, as well as which adaptation options can be included. The environmental report assesses the likely significant effects of the plan and programme on the environment. Climate change can influence these effects in the future and therefore climate change impacts on the plan or programme need to be assessed in the baseline description as well as the influence of other relevant adopted plans and programme. Significant problems and constraints caused by climate change on the plan and programme should be identified. At the implementation and monitoring phase climate change indicators can be taken into account to make sure that the plan and programme can withstand the effects of climate change. Finally the public participation process, which preferably takes place as early as possible to avoid public resistance at the end of the process by adopting the plan or programme, will lead to an increased climate change awareness.

The study showed that the procedural similarities between SEA and the development of an adaptation strategy should be used to the fullest. An SEA takes place at the



beginning of the development of a plan and is useful to evaluate the environmental impacts of adaptation strategies and to highlight possible conflicts with other existing regional/national adaptation plans.

Finally the study has shown that the integration of climate change adaptation concerns into the planning process is becoming more and more important at international, European and national level and therefore SEA is highlighted as a useful tool. For instance the Organisation for Economic Cooperation and Development and the European Union are working on guidelines to incorporate climate change adaptation concerns in SEA. At national level several countries such as the Netherlands and Scotland already developed such guidelines on a voluntary basis. Although it is highly recommended that the European Union establishes clear guidelines on how to integrate climate change adaptation concerns in the SEA to encourage Member States to make their planning process more 'climate proof'.



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