BASE BOTTOM-UP CLIMATE ADAPTATION STRATEGIES FOR EUROPE

Title: Policy integration and knowledge use in the EU adaptation strategy

Summary: This deliverable reviews the policy integration and knowledge use in the EU adaptation strategy at the EU level. An understanding of policy integration and knowledge use in the EU adaptation strategy is essential when one considers its implementation. The effectiveness of the strategy will depend on actions in a wide range of policy areas that do not necessarily have adaptation to climate change among their primary objectives. The report examines the structure and logic of the adaptation strategy and explores how the concept of policy integration is reflected in practice in two policy areas of interest, coastal management and rural and cohesion policies.

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BASE report

Policy integration and knowledge use in the EU adaptation strategy

1 Introduction

The European Commission adopted an EU Strategy on Adaptation to Climate Change (COM(2013) 216 final) in April 2013. The general aim of the Adaptation Strategy is to contribute to a climate resilient Europe by ensuring that adaptation considerations are addressed in all relevant EU policies. The EU Adaptation Strategy is designed as a "framework strategy" analogous to the framework directives that set general goals, outline the course of action and suggest processes for the implementation without regulating all specific details[1]. The Adaptation Strategy itself is a short document of 11 pages, but it builds on extensive Commission Staff Working Documents covering seven areas of interest such as infrastructure, health, cohesion, rural development and coastal development.

The effectiveness of such a framework approach depends on the successful transfer of concepts and knowledge of climate adaptation to a range of policy areas, institutions and processes. This is often referred to as policy integration or mainstreaming. In the EU-project 'Mediation', interviews with EU officials identified key policy issues to be multi-level governance and uncertainty, but also mainstreaming (Pfenninger et al., 2010). Interviews with Commission officials carried out under the Climsave project underlined further the key role that strong sectoral interests and stakeholders from civil society have to play (Pataki et al., 2010). The EU ADAM project identified the need for reflexivity in climate policy so that goals could be reassessed across policy sectors in the light of new scientific knowledge (Russel et al 2009). The EU project CLICO also identified that easily understandable sectoral guidelines may assist policy makers to integrate climate change adaptation into their areas of work and can help policy makers take decisions in the face of scientific uncertainty by outlining recommended courses of action (Gerstetter et al., 2012).

Past studies and practical experience underline that mainstreaming climate adaptation is a cross-sectoral challenge. A coherent approach to integration is required to enhance adaptive capacity and to maximise synergies among sector specific policy objectives. Mainstreaming also needs a platform for identifying, and where possible, addressing policy conflicts. The underlying premise of the challenge is that sectoral responses to potential impacts can be undermined by conflicts with existing policy objectives within a sector, or by negative policy spill-over between sectors. For example, a biodiversity policy with objectives to maintain a species or ecosystem *in situ* may conflict with a biodiversity adaptation response that facilitates the spatial shifts of ecosystems in reaction to changing climatic conditions. In a sector like water, efforts to adapt to reduced water availability may be undermined by consumer protection policies which seek to drive down water prices, thus reducing incentives for domestic water conservation.

One can argue that the challenge of climate change adaptation is comparable to that faced by environmental policy integration (EPI) and theoretical insights from studies of EPI can be used to identify crucial phases and elements in the process (Jordan and Lenschow 2010). Lafferty and Hovden (2003), expanding Underdal's (1980) general view of policy integration, argue that EPI implies the incorporation of environmental objectives into all stages of policymaking in non-environmental policy sectors, as well as an attempt to aggregate presumed environmental consequences into an overall evaluation of policy, and a commitment to maximize synergies and

[1] Legally speaking Directives are obviously stronger than strategies as they are binding as to the result to be achieved (§288 Treaty On the Functioning of the European Union, TFEU).

minimise contradictions between environmental and sectoral policies by giving principled priority to the former over the latter.

In comparing climate policy integration and environmental policy integration Adelle and Russel (2013) note that the strong normative tone of EPI as conceived by Lafferty and Hovden, which gives explicit priority to environmental values, may not bear out in practice. Underdal's original conceptualisation (1980), which takes integration to mean better incorporation and coordination of values to be considered in policy making, may be closer to practice and actual ambitions in EU policy. A non-normative integration is likely to be relevant especially for the integration of adaptation, which can primarily be seen as an effort to prepare for and master previously less recognised consequences of changes in the operating environment. These efforts can be seen as a refinement of rational decision making. However, it is also possible to arague that the integration of adaptation polices could aim for a broader account of *sustainable* adaptation in sector policies. The extent to which such normative elements exist in the efforts that the EU Adaptation Strategy has set in motion can be examined empirically.

In a non-normative perspective the integration of adaptation implies:

1) the recognition of adaptation objectives in all stages of policymaking,
2) a recognition of the presumed effects on the adaptive capacity in an overall evaluation of the policy,
3) a commitment to look for synergies and minimise contradictions between adaptation objectives and sectoral objectives.

Following Adelle and Russel (2013), this deliverable examines how these characteristics have materialised in the *interpretation* of climate adaptation, the *processes* of governing, in the *policy outputs* and, where possible, also in *outcomes*. The notion of outcome is difficult in relation to the Adaptation Strategy. In principle the primary *outcome* should be, as stated in the objectives[2] of the Strategy, an observable change in the capability or capacity to deal with the consequences of climate change. A more modest interpretation of the desired outcome would be to focus only on the instrumental objective of "developing a coherent approach and improving coordination". With this interpretation a documented development of a coherent approach and improved coordination would qualify as outcomes of the strategy, although they would in most policies be primarily regarded as outputs. In practice much of the coordination is expected to be reflected in action at the Member State level.

When focusing on the *processes* of governing Jordan and Schout (2006) emphasise the importance of having integration practices, mechanisms and tools to promote knowledge production and exchange. The use of knowledge is, however, not straightforward (Weiss, 1979; Owens 2012). Traditional conceptions of how to improve the influence of knowledge on decision making are often based on a model where knowledge will flow linearly to rational 'decision makers' demanding such information (Weiss 1979; Parsons 2002; Sanderson 2002; Owens 2005). But empirical findings suggest that knowledge use often strays from such rational linear and instrumental expectations as decision makers can consciously and/or unconsciously distort knowledge within the policy process as they try to cope with policy demands, context specific problems, higher level political priorities, etc (Juntti et al 2009; Owens 2012; Turnpenny et al. 2013). This problem can be exacerbated by the fact that a lot of knowledge is produced without fully considering user needs Fazey et al 2013). This report therefore recognises in its analysis the role played by knowledge in the integration processes, knowledge needs and gaps, and the implications of different conceptions of knowledge use for CPI.

[2] "The overall aim of the EU Adaptation Strategy is to contribute to a more climate-resilient Europe. This means enhancing the preparedness and capacity to respond to the impacts of climate change at local, regional, national and EU levels, developing a coherent approach and improving coordination." (COM(2013) 216 final, p. 5)

The Adaptation Strategy stresses the importance of knowledge and sees the strengthening of the portal Climate-ADAPT[3] as one of the main tools supporting knowledge accumulation.

Irrespective of the interpretation of outcomes, attribution is a problem. As the EU Adaptation Strategy has only been adopted recently it is obvious that outcomes cannot be attributed to the Strategy itself, but the history of the EU adaptation policy goes back to a series of documents that have culminated in the strategy. The European Commission Green Paper of June 29 2007 on adapting to climate change in Europe - options for EU action (COM(2007) 354 final) was the first effort to deal with adaptation at the EU policy level. The White Paper "Adapting to climate change: Towards a European framework for action" (COM(2009) 147 final) is the immediate predecessor of the Adaptation Strategy. Therefore, one can expect some recognition of adaptation issues at least in policy outputs and possibly in some factors that are likely to contribute to adaptive capacity.

The objective of this deliverable is to analyse EU Adaptation Strategy and how it can contribute to policy integration and production and use of knowledge of adaptation. It contributes in particular to BASE Objective 3: " Identify conflicts and synergies of adaptation policies at different levels of policy making with other policies (including climate mitigation) within and between sectors" and fulfils the EU part of the specific objective of Work Package 2 to "analyse the state of recent policy integration and knowledge use in climate adaptation of the European Commission and Member States."

The report is organised as follows. Chapter 2 develops a framework for exploring how the EU adaptation strategy is expected to work by examining its relevant features and underlying assumptions. Chapter 3 analyses integration in specific sector policies and examines how integration can be approached in European policies for coastal management and agricultural and rural development. These have been chosen because they are areas where recent advances and revisions have occurred at the EU policy level. Chapter 4 discusses the findings in terms of the rationality of adaptation, governance, processes for policy integration and outputs and outcomes. Chapter 5 concludes with policy recommendations.

2 The EU strategy and its programme theory (lead author Sabine Weiland, contributing authors Alessio Capriolo, Sergio Castellari, Francesca Giordano, Mikael Hildén, Duncan Russel)

The EU Strategy on Adaptation to Climate Change aims to contribute to a more climate-resilient Europe through addressing climate adaptation considerations in all relevant EU policies. It also promotes greater coordination and information-sharing between Member States and thus complements their activities. Climate change adaptation measures require the integration of different levels of governance (European, national, regional, local) and different sectors of economy and society. Integration means the EU has to 'mainstream' climate change adaptation by including adaptation measures in its sectoral policies and across all governance levels. This will also offer the potential for synergies when adaptation policies are successfully coordinated.

This chapter analyses how policy integration is conceptualised in the EU Adaptation Strategy. What particular integration does the Strategy wish to achieve? What has affected the choice of policy areas where integration of adaptation to climate change is aspired? Does the Strategy aim to radically change the thinking in the target sectors? How is integration thought to be achieved in the Strategy? This Chapter focuses especially on the underlying 'programme theory' of integrating and mainstreaming climate goals into different policy sectors and across governance levels.

[3] http://climate-adapt.eea.europa.eu/ [Visited October 31. 2013]

The chapter develops an analytical frame to assess climate policy integration in the EU Adaptation Strategy, based on the scientific literature on environmental and climate policy integration. Thereby, it goes beyond the Commission's impact assessment of the Strategy by offering insights from a policy analysis perspective. Policy analysis is used to reflect on the particular approach taken in the Strategy on integrating adaptation to climate change in the light of relevant literature. Such insights go beyond an analysis of possible social, economic and environmental impacts of the proposed policy to a more explicit exploration of the implications of the design of the Strategy in terms of its potential for integrating climate adaptation concerns into other sectors.

The chapter proceeds as follows. First, in section 2.1, a definition of policy integration is provided and a conceptual framework for the analysis is explained. In section 2.2, the EU Adaptation Strategy is examined to identify the relevant content for the analysis. In section 2.3, the analytical framework is applied to the policy content, in order to answer the questions on the 'programme theory' of the EU Strategy. The chapter closes with some conclusions on the prospects of policy integration in the EU Strategy.

2.1 Analytical framework: climate policy integration

Policy integration has been a focus of substantial debate in environmental and sustainability policies and, more recently, also in climate policy (Jordan and Lenschow, 2010, Adelle and Russel 2013). It refers to integration of a cross-cutting priority and objectives such as the environmental or climate into sectoral policies. The rationale for such an approach is that cross-cutting priorities can all too often fall between the gaps of narrower sectoral objectives or produce inconsistent or conflicting policy objectives. Climate adaptation is not immune to this problem as climate change impacts have implications for many sectors and actors. However, adaptation concerns may get side-lined as they can be obstructed by sectoral objectives that are of more immediate concern or competing with adaptation (Heller and Zavaleta, 2009).

As a policy principle, environmental policy integration – and by association, climate policy integration – is widely recognised, especially in the EU where it holds a prominent legal status (Jordan and Lenschow 2010). The assumption is that improved environmental or climate policy integration leads to better conditions for improving sector policy outcomes by ensuring that negative (environmental and/or climate related) side effects are avoided or by fostering co-benefits. At the same time, policy integration is a politically challenging concept. While the rationale to integrate seems straightforward and desirable, implementation at sector levels is rather complex. There may exist win-win options and co-benefits when integrating environmental or climate issues with sectoral policy objectives, but trade-offs will inevitably also occur. The latter are often manifested only at the sector and sub-sector levels. As a result, implementing integration often turns out to be a highly complex and potentially conflict prone process, where conflicts may arise between objectives within a sector or between sectors and broad societal objectives.

In the literature on environmental policy integration (EPI), the conceptual meaning of EPI has been subject to debate (e.g. Collier 1994; Liberatore 1997; Eggenberger and Partidario 2000; Lenschow 2002; Lafferty and Hovden 2003). More recently, the concept of climate policy integration (CPI) has come to the fore (Adelle and Russel 2013) which appears equally debated in the literature. Also, the relation between EPI and CPI is not always clear and differences between conceptualisations of integration in both discourses exist. In sum, policy integration remains an elusive concept open for divergent interpretations.

Subsequently, some of the ambiguous, at times competing perspectives on policy integration will be elaborated. The Chapter relies on the EPI literature which arguably is based on a richer conceptual background (Ahmad, 2009).The CPI literature will be consulted insofar as the approaches significantly differ from that of EPI. Three categories of analysis will be distinguished: 1) interpretations of policy integration, 2) governance of policy integration, and 3) outputs and

outcomes (Jordan and Lenschow 2010). In each category, the major issues of debate from the literature will be scrutinised. These form the basis for the analytical framework with which the climate policy integration approach of the EU Adaptation Strategy will be analysed.

2.1.1 Interpretations of policy integration

As defined in the introduction (Chapter 1) integration of climate adaptation policies can be understood as recognition of adaptation objectives in all stages of policymaking, recognition of the presumed effects on the adaptive capacity in an overall evaluation of the policy, and a commitment to maximise synergies and minimise contradictions between adaptation objectives and sectoral objectives. In the literature explicitly addressing CPI, a number of terms are used next to **climate policy integration**, such as **climate mainstreaming** and **climate proofing**. These are used sometimes interchangeably. Different connotation may however result from the fact that the three terms emerged from different contexts. Whereas climate policy integration is mostly seen as a component of environmental policy integration (e.g. Jordan and Lenschow 2010), the term climate mainstreaming is used in a development context in much the same way as integration is used in an environmental context (Yamin 2005). Climate proofing is frequently used in an EU climate and budgetary context (European Commission 2007; Medarova-Bergstrom et al. 2011) but also in the academic literature. It has “a certain sense of retro-fitting ‘climate proofing’ measures onto existing policies and sectors”, in contrast to climate integration that puts the issue “at the heart of the decision making process” (Adelle and Russel 2013, p. 4).

A broad discussion in the EPI literature is the rationale of policy integration. A distinction can be made between **rational and normative motives** (Persson 2004, p. 22). On the one hand, policy integration is the consideration of environmental/climate concerns at an early stage in the decision making process which includes taking into account potential contradictions, trade-offs and realising mutual benefits between environmental/climate and sector goals from early on. Better policy coordination is thought to contribute to more rational policy making and to greater effectiveness in achieving environmental/ climate objectives. On the other hand, environmental or climate policy integration is often addressed from a normative stance. This involves definition of the relative importance of environmental/climate objectives vis-à-vis sectoral objectives. Lafferty and Hovden (2003), for example, argue that environmental goals should be given “principled priority” over other goals as the former are crucial for sustaining life-support systems (ibid, p. 10). Taking a similar stance with climate adaptation goals, a mere “balance” of climate and other (sectoral) objectives would not be enough – the result from this perspective would be dilution of climate concerns rather than integration (Liberatore 1997).

This debate is closely linked to the debate on **weak versus strong** policy integration. Whereas weak integration implies that sectoral policy makers take environmental/climate considerations into account, strong integration means to place these considerations at the heart of the policy process in the sectors (Jordan and Lenschow 2010, p. 148). Again, the question is whether environmental/climate objectives should be given priority, or whether it is appropriate for policy integration that other objectives are deemed equally important. According to the latter weak interpretation, policy integration is rather concerned with coordination of different concerns and objectives (Peters 1998), and with potential synergy effects and co-benefits (Collier 1994, p. 36).

2.1.2 Governance of policy integration

The governance dimension of policy integration is equally debated among EPI scholars. It has been suggested that EPI can be seen as pertaining either to the **policy process** or to the **policy output** (Nilsson and Persson 2003, p. 335-6; Persson 2004, p. 22-3). Most studies identify EPI as a matter of process, with a focus on policy coordination between government agencies and systems to facilitate mainstreaming into sectoral decision making procedures. Policy outputs in contrast refer to

the strategies, actions and regulatory instruments put in place.The distinction between processes and outputs can however be challenging as the two are not always clearly separable. What belongs to the process and what to the outputs may also depend on the perspective. For example, a "standard" policy output is a policy instrument that is adopted and targets on specific actors and their activities in a sector. But the development and adoption of an instrument is also a process that may enhance integration. Furthermore the instrument itself may primarily aim at establishing a new integrating process, such as joint planning, rather than any direct substantive concrete measure (for example, some national adaptation strategies in EU Member States).

A third dimension often brought into play is **policy outcomes**, i.e. the actual change in behaviour stimulated by a policy. Technically speaking, policy integration is only achieved if an integrated output is eventually implemented and results in substantial alterations in behaviour. The analysis of policy outcomes is however subject to sectoral policy assessments – and may also be very difficult to determine because "the existence of so many potential causal factors and implementing instruments" (Jordan and Lenschow 2008. p. 18). Policy outcomes, therefore, will not be included in our analytical framework for the EU Adaptation Strategy.

Related to that, the **point of intervention** is also an important dimension to consider. It is based on a view of policy making as a cyclical process of agenda setting, policy formulation, policy adoption, implementation, and evaluation (Howlett and Ramesh 2003). Policy integration can be an issue at every stage of the cycle. Despite the critique of the policy cycle as too schematic and reductionist (e.g. Sabatier 1999), it may serve as a useful framework for understanding policy intervention in our context. As suggested by Jordan and Lenschow (2010, p. 152), it allows us to distinguish policy integration instruments that 1) aim to influence sectoral policy objectives (agenda setting phase), 2) target the allocation of resources in support of several sectoral policy objectives (policy formulation phase), 3) focus on the interaction of sectoral actors by changing the administrative system (policy formulation and policy adoption phase), and 4) monitor and evaluate the impacts of policy instruments (evaluation phase).

A further topic in the EPI debate is on the policy instruments used to achieve policy integration. Broadly speaking, one can distinguish between **hard versus soft policy instruments**. Both types differ mainly in the degree of coercion that their use involves. Therefore, it may be more accurate to talk of a continuum going from more coercive to more voluntary measures (Schneider and Ingram 1990). On one end of the spectrum, 'hard' policy instruments are regulations unilaterally laid down by the regulator that apply to regulatees, actively monitor compliance, and punish transgressions. On the soft end, regulators limit their intervention to that of advocates and information providers, or simply plead other actors to address certain problems (Zehavi 2012, p. 245). Economic instruments, such as taxes and transferable permits, fall in between the two ends, offering behavioural incentives but leaving it to actors how to respond. Hence, harder and softer types strive to achieve their regulatory goals in different ways. The opportunities for using different policy instruments differ depending on the instruments used in the policy area. In policies, which mainly rely on soft instruments, integration cannot be but soft, whereas the integration in policies using harder instruments can be achieved through a range of instruments from hard (e.g. mandatory reference to environmental/climate criteria) to soft advocacy.

Another important conceptual debate concerns forms of **horizontal and vertical policy integration**. The former refers to different parts of government and different policy sectors whereas the latter addresses its topics across different governance levels. In the horizontal dimension, there is debate on **policy integration as an overarching principle versus sector integration**. The question is whether integration refers to a cross-sectoral strategy spanning several policy areas or whether it concerns sector activities. Such a distinction is clearly made in the European Environment Agency's technical guidance on EPI (EEA 2005).The difference is that in the former case, integration is addressed at the level of policies and/or strategic level. In the case of sector integration, sector activities are included that may be beyond the direct government control (Persson 2004, p. 24). It should be noted that sectoral integration normally also involves a vertical

dimension, which signifies “the administrative responsibility ‘up and down’ with the arena of ministerial sectoral responsibility” (Lafferty 2002, p. 18).

In more general terms, policy integration in the vertical dimension can be viewed as a top-down issue **across governance or constitutional levels**, i.e. EU, national, sub-national, local levels. The EPI literature does often not take this dimension into account because it is not seen to contribute directly to the integration of environmental/climate concerns in sectoral policy making. Moreover, it is an inherently difficult area to study as the relationship between governance levels is very complex with many different issues forming the nature of relations well-beyond the issue of environmental/ climate policy integration. Coordination and cooperation are, however, important factors for policy integration, in particular if there are different responsibilities for the different stages of policy making (e.g. policy formulation at upper levels, implementation at lower levels) (Persson 2004, p. 24).

Another point to make about the existing literature on policy integration is in relation whether policy integration is pursued using more **centralised or diffuse means** (e.g. 6 et al. 2002, Page 2005, Jordan and Schout 2006). Put simply, centralised approaches seek to minimise the discretion of sectoral policy makers when for example integrating climate adaptation objects into their policy making through, for example, the setting of cross-sector targets and aims that have to be met. While such approaches seek to reduce the opportunities for incoherent approaches to adaptation, they may circumscribe autonomy at the lower levels limiting the opportunity for context specific action. More diffuse approaches seek to promote climate adaptation measures from the bottom up within sectors, with central actors becoming involved only when irreconcilable differences appear between different actors (Russel and Jordan 2009). This approach permits for greater flexibility within sectors allowing for the development of adaptation strategies targeted to the particular properties of the section at hand. However, it may not encourage a coherent approach to the integration of adaptation as sectoral actors follow their own preferred styles of action.

Policy integration may also be characterised according to the **logic of intervention**. It is possible to distinguish between institutional, political and cognitive logics (Jordan and Lenschow 2010, p. 153). Viewed from an institutional perspective, policy integration is a matter of coordination. Policy coordination can take different forms, e.g. it may focus on different governance levels or it may follow a strategic or operational approach (Schout and Jordan 2008). From a political perspective, the focus is more on the contention that arises in the administration as a result of distinct cultures and administrative routines in the bureaucratic segments, and from established values and vested interests attempting to fend off the intervention. From a cognitive perspective, policy integration is conceived to happen through the minds of policy makers and stakeholders. In the EPI literature, it is a matter of great debate how and under which conditions such learning is taking place (e.g. Nilsson and Persson 2008). Also, the question is how ideational change and institutional and administrative change are related to each other. Empirical observations suggest that institutional and cognitive instruments are the most often used in environmental policy integration whereas explicitly political measures that target particular power constellations are only rarely found (Jordan and Lenschow 1010, p. 153).

A final, yet important issue in EPI debates is **participatory policy making** and its role in environmental/climate policy integration. The EU Adaptation Strategy clearly stresses involvement. Participation may be an important means to achieve policy integration through involvement of additional information and knowledge as well as perspectives that actors hold. In addition, participation has the potential to make policy integration processes more democratic (Persson 2004, p. 25). It is however debatable whether participation as such is automatically contributing to policy integration in substantive terms (from an output perspective).

2.1.3 Outputs and outcomes

Whereas the above dimensions largely concern process variables of policy integration, outputs and outcomes should also be considered. As argued above, the analysis of policy outcomes is in

general hard to measure and will be subject to sectoral policy assessments. However, the question here is whether there are any provisions for the administration for monitoring and evaluation of the results that the policy intervention has brought about.

2.1.4 The analytical framework

By combining Sections 2.1.1-2.1.3 one obtains a framework that explores the different dimensions of climate policy integration (Table 2.1). This framework will be applied to examine the climate policy integration taken in the EU Adaptation Strategy.

Table 2.1 Analytical framework for analysing climate policy integration in the EU Adaptation Strategy

Interpretations of climate policy integration (CPI)
- Which terminology for CPI is used in the EU Adaptation Strategy? - CPI as a normative vs. a rational concept: Does the Strategy define a specific weight to climate issues and objectives, or is CPI addressed as a rational task? - Weak vs. strong integration: Should climate objectives be given priority, or are other (sectoral) objectives deemed equally important?
Governance of CPI
- CPI as a process vs. an output: Is policy integration conceptualised as a process or as an output? - Point of intervention: Which stage in the policy process is addressed in the policy intervention? - Hard vs. soft policy instruments: Which policy instruments are employed to achieve CPI? - Policy integration vs. sectoral integration: Is CPI addressed in an overarching way, or by means of sectoral policy integration? - Vertical integration of different governance levels: How is CPI thought to be achieved across the different levels of governance? - Integration achieved by centralised or diffuse means: How much discretion is granted to sectoral policy makers? - Logic of intervention: Is climate policy integration approached from the perspective of an institutional, political, or cognitive logic? - Policy integration and participatory policy making: Which role does participation play in the approach?
Outputs and outcomes of CPI
- Monitoring and evaluation: Which provisions exist for monitoring and evaluation of the outputs and outcomes resulting from the policy intervention?

2.2 The EU Adaptation Strategy

The EU Strategy on Adaptation to Climate Change aims to contribute to a climate resilient Europe. It is built around three specific objectives:

- Better informed decision making, by improving the knowledge base and enhancing dissemination of knowledge, particularly through the platform Climate-ADAPT;
- Increasing the resilience of the EU territory: This is done by promoting action by Member States, and by vertically integrating different levels of governance;
- Increasing the resilience of key vulnerable sectors: The Strategy should develop initiatives for a consistent and comprehensive integration of climate adaptation considerations into sectors through EU common policies.

For the purpose of this Deliverable, the focus is on the third objective, namely integration of climate issues into sectoral policies, as stated in the BASE DoW (WP2.1).

2.2.1 Integrating climate adaptation into sectoral policies

Climate policy integration in form of 'sectoral mainstreaming' has already been a key pillar of the 2009 White Paper on Adaptation. Mainstreaming initiatives took place in sectors such as water management[4], marine and fisheries, coastal areas, agriculture and forestry, biodiversity, infrastructure, finance and insurance[5], disaster risk reduction, and health.[6] It should be highlighted that a number of initiatives were cross-sectoral and integrated policy initiatives such as Regional and Cohesion Policy, and the Common Agricultural Policy. In addition, several inter-regional initiatives exist, such as the 2012 Alpine Strategy for Adaptation to Climate Change in the field of natural hazards (EEA 2013, p. 65).

The EU Adaptation Strategy will continue these integration efforts and take further actions where adaptation needs to be reinforced within EU policies. Forthcoming policy initiatives, in areas such as invasive species, green infrastructure and land as a resource, are expected to consider adaptation.

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4 The European Commission initiated a number of research projects that have resulted in relevant policy recommendations in terms of integrating and mainstreaming climate adaptation.

In the field of water management, the project CLIMWATADAPT (www.climwatadapt.eu) [Visited November 1 2013] recommends the European Commission to develop guidance and best practices for comprehensive risk assessment in the international river basins that should be made compulsory as a part of the negotiated agreement between the concerned Member States. In particular, with reference to two issues such as desalination or water transfer, it should be made compulsory to demonstrate that the welfare costs caused by additional water demand management options exceed the welfare costs of increased water supply.

The role of guidance is stressed also in the policy recommendations where is said that although adaptation to climate change is not explicitly included in the text of the WFD or other water related sector policies, however several efforts in water management exist that aim to address the challenges posed by climate change. These efforts need to be strengthened and often brought to a broader level of application and this can be done by providing additional guidance or specific funding of measures. As well, any revision of EU water legislation should include the aspect of climate change (e.g. requiring climate proofing of any action that has to be taken under this Directive).

5 With reference to finance and insurance sector, the FP7 research project RESPONSE (www.responsesproject.eu) [Visited November 1 2013] has recommended the European Commission to consider a guidance document for catastrophe insurance that is sensitive to the risks of mal-adaptation.

6 See the up-to-date overview of the main initiatives for integrating climate adaptation into EU sector policies at Climate-ADAPT, http://climate-adapt.eea.europa.eu/web/guest/eu-sector-policy/general. [Visited November 1 2013]

Also, the EU Multi-annual Financial Framework 2014-2020 recognises mainstreaming of climate adaptation as a key objective.

These positive developments notwithstanding, gaps still exist in adaptation uptake in key sectors. For example, the existing social policies that do not explicitly address the likely impacts of climate change on the social domain. This could impede progress in the social pillar of the Europe 2020 Strategy, namely regarding the negative effects of climate change on employment and social cohesion. In addition, climate change considerations remain vague in the planning of many future infrastructure investments. Whereas climate resilience has been taken up in some policy areas as a parameter in cost-benefit analyses during the project development phase[7], there is no general requirement to do so. Overall, the EU approach to mainstreaming to some extent appears piecemeal (SWD (2013) 132 final, p. 17-20, 23-4).

Increasing climate adaptation capacities in key sectors therefore is a crucial objective. More specifically, the goal of sector integration of climate adaptation can be split into two operational objectives, namely

- A comprehensive and consistent mainstreaming of adaptation in EU policies;
- Major infrastructure investments that are climate proofed.

These two objectives were subject to an Impact Assessment carried out on the EU Adaptation Strategy (SWD (2013) 132 final).

2.2.2 Impact Assessment on options for promoting adaptation action in key EU sectors

The Impact Assessment on the Strategy specified and compared a number of different policy options to achieve the two operational goals above. For each operational goal, a number of regulatory options were considered. Table 2.2 summarises the considered policy options under the objective of sectoral integration of adaptation. The options should be compared horizontally to the reference scenario (no policy change). In the following, the policy options referring to the two operational objectives will be briefly discussed.

Regarding the objective of a **comprehensive and consistent mainstreaming of adaptation** in EU policies the Impact Assessment discussed three policy options (3A – 3C). They covered a range of policy interventions, ranging from soft measures to regulatory action. Options 3B and 3C were alternatives, whereas option 3A could be combined to either or.

- Option 3A: Guidance on how to mainstream adaptation in Cohesion Policy and the Common Agricultural Policy. It would provide guidance to facilitate the integration of climate adaptation considerations into operational and rural development programmes and projects.
- Option 3B: Listing mainstreaming priorities in EU policies and engaging with key stakeholders. Under this option the Commission provides a list of priority initiatives for mainstreaming adaptation into EU legislation. This could include the transport, energy and construction sectors, among others.
- Option 3C: Setting new calendar for revision of key EU legislation as part of the mainstreaming exercise. The option considers amending the calendar of revision of key EU legislation which would need to integrate climate change adaptation (SWD (2013) 132 final, p. 30).

[7] For example, in the proposal for “Guidelines for trans-European energy infrastructure”, COM(2011)658.

Table 2.2 Policy options considered in the Impact Assessment of the EU Adaptation Strategy for promoting adaptation action in key EU sectors SWD (2013) 132 final, p. 27).

Problem	Specific objective	Operational objective	Options			
			No policy change	Providing information and guidelines	Direct intervention	Regulatory approach
Gaps in adaptation uptake in key sectors	Increasing the resilience of key vulnerable sectors	By 2020, a comprehensive and consistent mainstreaming of adaptation in EU policies is achieved	Piecemeal approach to mainstreaming	3A: Guidance on how to mainstream adaptation into Cohesion Policy and the CAP	3B: Listing mainstreaming priorities in EU policies and engaging with key stakeholders	3C: Setting new calendar for revision of key EU legislation as part of the mainstreaming exercise
		By 2020, major infrastructure investments are climate-proofed	Revision of EIA and guidelines under TEN-E and TEN-T	3D: Guidelines for project developers for climate proofing vulnerable investments[8]	3E: Promote inclusion of climate change adaptation consideration in relevant infrastructure standards	3F: Proposal on mandatory requirements for climate resilience of infrastructure projects

The discussion of these options in the Impact Assessment led to identifying a so called preferred policy package including options 3A and 3B. Option 3C was discarded because of its political nature. A risk is that the adaptation agenda would conflict with the agenda of other sectoral issues (SWD (2013) 132 final, p. 51).

Regarding the second operational goal of **climate proofed infrastructure investments**, again three policy options were discussed, which could potentially all be combined. They also included a variety of interventions from soft measures to regulatory action.

- Option 3D: Guidelines for project developers for climate proofing vulnerable investments. The option considers – either voluntary or mandatory – guidelines for infrastructure projects on how to incorporate resilience to current climate variability and future climate change within these projects.
- Option 3E: Promote inclusion of climate change adaptation considerations in relevant infrastructure standards. That means the Commission would mandate European

[8] The FP7 research project CLIMWATADAPT recommends that the Strategic Environmental Assessment (SEA) should be used for climate proofing of new development projects, so that adaptation measures (like, for example, natural retention of flood water and coastal protection infrastructure) can be integrated into short and long-term plans of water management activities, and thus society's resilience to climate change can be improved. In order to do so, a better guidance on how to consider adaptation issues better in the SEA is identified as policy option.

standardisation organisations to prioritise relevant design standards that would need to be modified so as to take account of climate change impacts.

- Option 3F: Mandatory requirements for climate resilience of infrastructure projects. Under this option legally binding design standards on the resilience to climate change of existing and future infrastructure would be elaborated. The Member States would then have to set up minimum climate resilience standards for infrastructure investments.

The preferred policy package included only policy options 3D and 3E. 3F was rejected because of potential implementation difficulties, long-term technological lock-ins which may prove inefficient, and expected resistance from stakeholders (SWD (2013) 132 final, P. 52).

On the basis of the brief discussion above of feasible policy options in the EU Adaptation Strategy, the following sections analyse climate policy integration and how it is envisaged in the Strategy, particularly regarding the preferred policy options.

2.3 Analysis of the 'programme theory'

The EU Adaptation Strategy is designed as a 'framework strategy' that sets out general goals, outlines the course of action and suggests processes for the implementation. The specific details are however not regulated. But even if the Strategy itself is a short document, it builds on extensive Commission Staff Working Documents covering a variety of areas of interest such as infrastructure, cohesion, rural development and coastal development.

2.3.1 Interpretations of climate policy integration in the Adaptation Strategy

It is interesting to note that the EU Adaptation Strategy does not use the term 'integration' (of climate adaptation). It rather speaks of **'climate-proofing'** (of EU Action, of various sectors such as the Common Agricultural Policy, Cohesion Policy and Common Fisheries Policy) and at one point of 'mainstreaming' adaptation. This might illustrate the fact that the approach taken by the Commission that climate policy integration is, first and foremost, one of a retro-fitting activity that brings climate adaptation into already existing policies and sectors.

In line with such an approach, the EU Adaptation Strategy understands integration of climate adaptation considerations in a **non-normative** way. Climate policy integration is not given a principled priority, rather a rational view for considering climate goals prevails. For example, the Adaptation Strategy states that *"it is cheaper to take early, planned adaptation action than to pay the price of not adapting"* (COM(2013) 216 final, p. 2). The Strategy lacks a normative stance which would include providing a specific weight of climate issues in relation to others (for example climate goals are 'as important' or 'more important' than other goals).

This is closely related to the debate in the EPI literature on **weak versus strong integration**. In the Adaptation Strategy, the Commission seems to aim at a rather weak form of climate policy integration. It emphasises coordination of different policy objectives in the sectors, and co-benefits that might occur. The Strategy, for example, states that

"adaptation action will bring new market opportunities and jobs, in such sectors such as agricultural technologies, ecosystem management, construction, water management and insurance. European companies, including SMEs, can be early first movers in developing climate-resilient products and services and grasp business opportunities worldwide" (COM(2013) 216 final, p. 5).

Conflicts that might arise in the adaptation process are also mentioned, but more with a view to attempting to avoid them, meaning that climate adaptation goals should be brought into line with other objectives in the sectors.[9] It is however not specified how emerging problems could or should

[9] According the European Commission, crosschecks should be made to assure that mainstreaming in one policy does not transfer the vulnerability of one sector or area to other sectors or areas. The assessment has

be dealt with – the implementation of climate adaptation in sectoral policies is entirely left to the sectors themselves. As a result, the specific weight that will eventually be given to climate adaptation in relation to other goals – and hence the question whether climate integration will be weak or strong - may differ from sector to sector.

2.3.2 Governance of climate policy integration in the Adaptation Strategy

The governance of climate adaptation in the EU Strategy reveals a differentiated picture. First, regarding the question of whether climate policy integration is conceptualised as a **process** or as an **output/outcome**, one can say that the Strategy clearly takes a procedural approach. This can, for example, be seen in the policy options that are discussed in the Impact Assessment report. It talks about lists of priority sectors for mainstreaming climate adaptation; and about guidelines on how to promote the integration of climate adaptation goals. These are all procedural issues. The Strategy stipulates that adaptation considerations have been mainstreamed in key EU policies by 2020 – which can be considered an outcome – but it is rather vague what exactly this means. Hence, one should consider this as a general direction or '*Leitbild'* which is expected to lead to more specific formulations at the level of sectors.

As regards the **point of intervention** that is envisaged by the Strategy it appears to address, first and foremost, the phase of agenda setting. The overall goal of sectoral mainstreaming is set, and beyond that further policy interventions still needs to be formulated in order to achieve that goal. The second operational goal of climate proofing of policies is however more inclined towards the phase of policy implementation, although here as well the concrete policies still have to be set up. In general, as expressed earlier, the EU Adaptation Strategy can be characterised as a framework in which more concrete policies still need to be filled in.

Another important governance issue is the **policy instruments** that are employed to achieve climate policy integration. Here, one may at first assume that soft policy instruments are favoured. The policy options identified as part of the preferred policy package in the impact assessment are informational policy instruments, such as guidelines, and interventions, for example the listing of priority sectors, or promotion of inclusion of climate adaptation in infrastructure standards. Reference to voluntary action is made several times. The impact assessment discussed a number of regulatory policy options as well but these were discarded in the course of the assessment. As a consequence, the policy instruments included in the Strategy specifically target the policy making process.

The view that the Strategy employs soft policy instruments, rather than hard ones, may however change when one examines the sector level. There, integration of climate adaptation in more concrete policy areas is indeed foreseen to happen through regulation. The Flood Directive is a case in point, and others can be expected.

In sum, at the level of the Strategy itself, a soft regulatory approach may prevail but the picture changes when it comes to the sector level. The same might hold true for monitoring measures (see below under outputs and outcomes). This also raises the question on how to measure the success of the integration initiated by the Strategy. Should one consider integration that leads to hard instruments at the sector level more successful than integration which only appears as soft instruments at the sector level? A general conclusion is not likely to be possible. It will be necessary to reflect on the general regulatory framework of the sectors and see how adaptation has been incorporated in the instruments in use.

The question whether climate policy integration is addressed in an **overarching way or by means of sectoral policy integration** is a further important characteristic. At first glance, the EU seems to

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to be supplemented, however, by a more detailed assessment for the specific regional circumstances where the measure should be implemented. The assessment criteria developed in the FP7 research project CLIMWATADAPT can guide this process.

pursue a sectoral integration strategy as the Strategy states sectoral mainstreaming as one of its primary objectives. The rationale for this is that the integration needs are very diverse across sectors; therefore each sector has to follow its own specific adaptation course. On the other hand, several of the 'sectors' the Strategy targets are in a sense 'cross-sectoral'. For example, Action 2 of the Strategy "Provide LIFE funding to support capacity building and step up adaptation action in Europe (2013-2020)" cuts potentially across sectors. Cohesion policy, mentioned in Action 6: "Facilitate the climate-proofing of the Common Agricultural Policy (CAP), the Cohesion Policy and the Common Fisheries Policy (CFP)" are also strongly cross-sectoral. In terms of substance, numerous policy areas do in fact cross sectors (which is part of the challenge that adaptation faces). Coastal policy and agricultural policy, both discussed in further detail in chapter 3, are cases in point. In that sense, the Strategy can also be interpreted to function like glue between or a catalyst across sectors.

As regards vertical integration of climate adaptation across the different levels of governance, different constitutional levels which are also addressed in the EU Adaptation Strategy through promoting action by Member States are not included.[10] In sectoral integration, there is also a vertical dimension involved. This is however not specifically tackled in the Strategy. Rather the sectors are addressed as such (as entities) without paying special attention to vertical governance and coordination issues.

Another way of characterising the EU approach to climate policy integration in the Strategy is whether it uses **centralised or diffuse means** to achieve its goals. Throughout the Strategy, one finds that it leaves a lot of discretion to the sectors, thus favouring a bottom up approach within the sectors for the development of adaptation strategies and action. This finding is in line with its character as a "framework strategy", and the emphasis it puts on processes rather than on outputs and outcomes.

The **logic of intervention** the Strategy follows can be characterised as an institutional logic. Policy integration is clearly seen as a matter of coordination (within sectors and across sectors). For example, the Strategy explicitly elaborates on the governance of climate adaptation (section 5.1). The cognitive and political logics do not play a great role in the approach of the Strategy. For the former, the justification of EU climate adaptation action could have been given more room in the Strategy, so as to potentially convince policy makers and stakeholders of the course taken. Yet the elaboration of the necessity to address climate adaptation on EU level is very brief:

"Building on those initiatives [such as LIFE], it would be useful to deepen our experience and to have a systematic exchange of best practice on how to adapt to climate change. It is therefore opportune to launch an adaptation strategy, covering the whole of the EU and respecting the principles of subsidiarity and proportionality..." (COM(2013) 216 final, p. 4-5).

Neither is there a strong political logic of intervention in the Strategy. This can, among others, be seen from the fact that there are no specific actors or actor constellations explicitly mentioned or addressed. Instead the Strategy highlights the governance dimension of climate adaptation action.

Finally, regarding policy integration and **participatory policy making**, one can note that the Strategy takes this into account to some extent. For sectoral adaptation, it does mention consultation and cooperation, and the need to engage in dialogue processes with stakeholders, for example SMEs and insurance companies. It is however not spelled out how this should happen and what participation exactly means in this context. Also, according to the Strategy, adaptation is seen to happen mostly through public policy intervention. It appears that there is very little consideration of active adaptation that occurs spontaneously without the help of the public sector. This can lead to the conclusion that participation is thought of in terms of implementing or executing public policy measures, rather than a form of private adaptation without strong public involvement.

[10] BASE Deliverable 2.2 will deal with adaptation to climate change in the EU Member States.

2.3.3 Outputs and outcomes of climate policy integration in the Adaptation Strategy

As already mentioned above, the focus of the Strategy is on the early phases of the policy cycle, in particular policy formulation. Regarding provisions for **monitoring and evaluation** of the outputs and outcomes, there is not much detail in the Strategy. It is said that monitoring and evaluation of climate change adaptation are crucial. However, in general, the emphasis is still on monitoring climate impacts instead of adaptation action and its effectiveness.[11] To strengthen monitoring of action the Commission is planning to develop a scoreboard to help evaluate adaptation efforts and vulnerabilities across the EU. Much will depend on the concrete indicators that are included there. Such a device may well work as a "soft whip" to achieve integration goals. Hence, it is possible to implement a much stronger adaptation course than is actually suggested by the Strategy. This again is connected to the character of the Strategy as a framework strategy – much is left to the way it will be eventually filled with more substantial content.

It is worth noting that there is virtually nothing in the Strategy in terms of monitoring of the success of integration within the Commission and EU policies. Yet the success of the strategy will also depend heavily on the success of the sector integration at the EU level within the Commission.

2.4 Conclusion: Policy integration in the EU Adaptation Strategy

By way of conclusion, this analysis has found that the approach to climate policy integration of the EU Adaptation Strategy can be characterised as a rational, weak form of policy integration, achieved through a procedural approach. The use of soft policy instruments prevails. This finding is in line with the framework character of the Strategy that sets out general goals, outlines courses of action and suggests processes for the implementation. The future of adaptation activities at the EU level will greatly depend on Commission staff interaction between DGs, as the Strategy itself does not include particularly strong commitments and there is no reporting obligation across sectors at the EU level. At the same time, the Strategy is built strongly around the idea that other policy areas and sectors pick up the ball – as the real climate adaptation 'work' will have to be done in the sectors.

If the assumption of rational planning is valid and sufficient and reliable information is available on likely impacts of climate change in specific sectors, this is likely to work. It is, however, also likely that conflicts will arise at sectoral level which will impede such a rational way of proceeding. As a result, the apparent 'soft' approach of the EU Strategy might easily turn into 'hard' approaches in the downstream regulation (e.g. mandatory risk assessments), which may result in political and conflict prone constellations in climate adaptation policies.

In addition, uncertainty is likely to affect outcomes of the strategy. In sectors where there are great uncertainties on the significance of the impacts of climate change relative to other drivers, the reliance on soft instruments may not initiate any adaptation action at all. As will be argued in the subsequent Chapter, the distribution of cost and benefits of climate adaptation initiatives involves few externalities, but the obstacle to climate adaptation integration may instead concern decision making under uncertainty. Hence, it is possible that a strategy that relies on information and attention focusing may fail to activate sectors where information is scarce.

The power of the EU Adaptation Strategy to steer policy processes is limited by its framework character and its focus on the early (agenda setting) stages. Policies are being formulated throughout the policy cycle, especially as it is implemented on the ground. It is vital that the Strategy bites at this stage in order to be successful. This can be achieved by a strong coordinator or by

[11] Under Horizon 2020, however, evaluation of climate adaptation will further expand also through major research efforts on climate change adaptation.

genuine adoption of the mainstreaming and climate proofing by the sectors. The Strategy relies on the latter.

When interpreting the 'programme theory' of the Strategy, it is also necessary to consider the political dimension of the document. The Strategy is only a short document that largely relies on Commission staff documents. This can be interpreted as a way to make the Strategy 'uncontroversial'. This was achieved in that the Strategy was hardly debated in the Council. The Commission appears to be cautious and is likely take a stepwise approach in the years to come. Yet the question remains how long substantial debate can be kept off the agenda. The Strategy is now under and will continue to be under discussion between Member States in the Climate Change Committee. Furthermore, there are ongoing activities to develop a monitoring mechanism for adaptation which will be put into action in the not so far future.

On a conceptual note, it may be added that the literature on policy integration is rich in conceptual debates, but so far lacking when it comes to the question of measuring policy integration as an outcome (see also Adelle and Russel 2013, Jordan and Lenschow 2010). This means that there is little knowledge as to what types of policy integration strategies are effective, and of best practice examples. Thus, while the EU Adaptation Strategy can be characterised – as done in the analysis of the programme theory – there is as yet no standard for evaluating its effectiveness in terms of outcomes. The analysis of sectoral policies which follows in the next chapters still offers the opportunity to evaluate its effectiveness as far as its impact on sectoral policies

3 Conditions for policy integration in different policy areas at the EU level (lead authors Mikael Hildén, Eleni Karali Helle Ø Nielsen; Contributing authors Sabine Weiland, Duncan Russel, Alessio Capriolo, Anne Jensen, Katriona McGlade, Kirsi Mäkinen, Anders Pedersen)

3.1 Observing integration in EU policies

This Section will provide a brief overview of how the integration of climate change adaptation in other policy areas can be observed and documented, building on the general programme theory in Chapter 2. A "non-normative" integration concept of Environmental Policy Integration (EPI) is used due to the specific character of adaptation. EPI, and also climate policy integration in the context of mitigation, tries to address externalities and market failures through the integration of new demands in policies that promote activities causing externalities. The integration of adaptation has a different starting point. It can appeal to the self-interest of the actors in a changing operating environment. At the policy level it may need to deal with spill-overs, trade-offs, moral hazards and decision making under uncertainty, but less with externalities. If one introduces strong sustainability demands on adaptation (for example, that it must not cause any additional GHG emissions, nor have negative spill-overs on other environmental concerns) then the situation changes somewhat, but this change comes about because of the additional sustainability demands. Here the primary focus is on the integration of "pure" adaptation, without considering extensively (additional) sustainability demands.

A simplified framework has been developed based on the in depth analysis in Chapter 2 for examining key issues that emerge in exploring integration of climate change adaptation. While Chapter 2 examined integration as seen in the Adaptation Strategy itself, the analysis on Chapter 3 seeks to understand integration from the perspective of the "recipient" sectors and policies. Considering the differences in institutional configurations, climate change impacts, and political and economic contexts, the following Sections seek to better understand: 1) how EU policies differ with respect to adaptation strategies; 2) the extent to which different climate change adaptation policy

integration measures and strategies have been operationalized in the sectors; and 3) the lessons that can be learnt for climate change adaptation policy integration from the conditions in the chosen sectors that differ substantially from one another.

As noted in Chapter 2, the EU Adaptation Strategy is strongly based on the idea of policy integration. Following Adelle and Russel (2013), the focus is on the processes of governing and on the policy outputs and outcomes. The process of governing broadly refers to the deployment of various combinations of policy tools, mechanisms and procedures that pursue policy integration (Jordan and Lenschow 2010) – see below for one typology to classify governance processes. With outputs, the focus is more on whether the integration processes have led to the development of specific products (e.g. an impact assessment in an area of sectoral policy making that picked up on climate impacts and adaptation costs and benefits) or specific adaptation policy measures within sectorial policy. As mentioned above the issue of measuring outcomes is more tricky, due to the complex number of interacting variables beyond the integration strategy that can lead to a given outcome; in the case of adaptation an observable change in the capability or capacity to deal with the consequences of climate change. Moreover, outcomes take time to manifest whereas the EU adaptation strategy is a very new development. Hence, for this deliverable a more modest goal in terms of measuring outcomes is pursued: whether a coherent approach has been developed and whether coordination has been improved.

Process of Governing

At the level of governing processes there are several ways to ensure the integration of a policy. One can distinguish between procedural, organisational and normative approaches (Mickwitz et al., 2009), but especially normative and procedural processes tend to blend. A further level of distinctions includes specific tools and mechanisms for integration (Schout and Jordan, 2008):

- Hierarchical instruments –control by a central body prescribing integration (e.g. an inter DG committee staffed by senior officials, an executive committee chaired by the President of the committee, or even regulatory stipulations for sectors to consider integration criteria)
- Bureaucratic rules and standard operating procedures – the creation of rules that mean the lead DG will actively inform and coordinate with other DGs (e.g. Impact Assessments)
- Staff training – to encourage officials to work in a more coordinated way.
- Specification of output and/or tasks – e..g setting targets, harmonizing coordination processes, requiring DGs to undertake a climate risk assessment.
- Horizontal instruments such as informal relations, liaison officers (officials with an overview of the coordination problem), task forces (temporary inter DG tasked with dealing with a specific coordination problem) teams and teams (networks of officials across DGs) – these initiatives promote a more decentralised approach to encourage communication and cooperation between different actors
- Mission statements such as an adaptation strategy that seeks to influence culture and values of an administration.

For the EU level, where policies provide the general frame for implementation in the Member States, only some of the approaches are feasible and relevant for a special topic such as climate change adaptation. For example, hierarchical instruments, which would lift the responsibility for adaptation to a hierarchically superior body with special coordinating powers are not a realistic option at the EU-level. Instead rules and standard operating procedures can be applicable and can strengthen the position of the policy to be integrated both at the EU and Member State level (Jakob et al., 2008; Mickwitz et al., 2009). The specification of outputs and tasks relevant for adaptation is also feasible at the EU level. Horizontal instruments may have some utility within the Commission affecting the general governance and guidance, but are not likely to be able to push integration of adaptation

strongly. Similarly mission statements may make a policy visible, but without rules and operating procedures they are unlikely to achieve much on the European scene, which is dominated by strong political agendas.

Central to the issue of CPI as a process is how established procedures, mechanisms and tools promote knowledge production and sharing (Jordan and Schout 2006; Schout and Jordan 2008; Russel and Jordan 2009). Crucially, knowledge use and exchange underpins this integration process by identifying within and between sector policy conflicts, impacts and spill-overs through which learning, cooperation and reframing can occur (Jordan and Schout, 2006). Thus without knowledge production and processes of knowledge sharing, actors may not realise the necessity of integration, or crucial areas of activity may be missed out to the detriment of enhancing adaptation capacity. However, as noted above, traditional conceptions of how to improve the influence of knowledge on decision making are often based on technical issues such as improving the collection of knowledge (Owens *et al.*, 2004) in a manner where knowledge will flow linearly to rational 'decision makers' demanding such information (Weiss 1979; Parsons 2002; Sanderson 2002; Owens 2005). This is the so-called technical rational (Owens 2004), instrumental (Weiss, 1979) or 'input-output' model (Rich 1997) of knowledge use. The assumption here is that once the 'right' type of knowledge is supplied then rational decision makers will act upon this knowledge base to produce more effective environmental policy.

Studies of knowledge utilisation have shown that 'use' (of knowledge) is not an "all encompassing concept" or simple concept Rich (1997: 15). Consequently, mapping the degree of knowledge utilisation ultimately depends on what types of knowledge are being investigated, what the analyst means by 'use' and like CPI more generally, whether they see knowledge utilisation as an 'outcome' or a 'process' (ibid: 12). It is perhaps not surprising that knowledge utilisation is often far removed from the instrumental model (Juntti et al 2009; Owens 2012; Turnpenny, et al. 2013) when more often than not, knowledge producers supply knowledge in a manner that does not necessarily consider the needs of the user or the context in which it will be employed (Russel and Jordan, 2007; Fazey et al 2013); factors determined by the level of expertise within an organisation, the data required understand the policy problem, the context of the decision making sector, the speed of decision making, among others. Therefore this Chapter also examines which kind of knowledge is particularly important for the implementation of adaptation in the sectors in a more integrated and coherent manner."

Outputs and Outcomes

Outputs and outcomes would refer to the actions that aim at increasing adaptive capacity and the actual increase in adaptive capacity. At the EU-level the causal chain between the policy and the outcome is generally difficult to determine as policy outcomes are affected by a host of interacting processes. Therefore, it is necessary to identify a practical set of criteria for examining the integration of adaptation into coastal and agricultural policies, paying attention both to the processes and outputs and outcomes. Mickwitz et al. (2009) developed a set of generic questions for identifying the degree of integration and Brouwer et al. (2013) modified the criteria to be applied in the context of water policy. Brouwer et al. (2013) stress the need to modify and reduce the criteria when focusing on adaptation. For the purpose of this analysis criteria related to reporting are reintroduced. At the level of EU-policy, the inclusion of a reporting obligation can be seen as a measure of successful integration because it is the result of political negotiations between the Commission, the Council and the Parliament. It is also a reflection of the use of bureaucratic rules and operating procedures or the creation of specific tasks. Mickwitz et al. (2009) also include a criterion related to know-how. It can be a condition for or a consequence of integration. It is difficult to operationalize at a European level and therefore not very suitable for analysing integration in EU policies. This leaves four basic criteria and related questions (Table 3.1). These questions allow us

to see to what extent one can detect features that ensure that climate change adaptation is on the agenda of the policy in question.

Table 3.1 Criteria and questions for examining integration of climate adaptation (modified from Mickwitz et al. (2009) and Brouwer et al. (2013).

Criterion	Key questions
Inclusion	To what extent have adaptation objectives and/or direct as well as indirect adaptation needs been identified?
Consistency	Have the contradictions between the aims related to climate change adaptation and other policy goals been recognised and have there been efforts to minimise revealed contradictions?
Weighting	Have the relative priorities of climate change adaptation compared to other policy aims been decided and are there procedures for determining the relative priorities?
Reporting	Are there clearly stated evaluation and reporting requirements for climate change adaptation (including deadlines) ex ante and have such evaluations and reporting happened ex post? Have indicators been defined, followed up and used?

The criteria of Table 3.1 of policy integration address primarily the political-administrative level of policy-making, constituting reasonable indicators of integration of climate adaptation into policy output. But the overarching goal of mainstreaming must be followed up by further policy interventions to ensure implementation of climate adaptation objectives on the ground (Urwin and Jordan 2007). This is particularly important where integration of climate adaptation objectives into sectoral activities depends significantly on actions by private actors, such as farmers or privatized water utilities. Therefore, where relevant, the Chapter will examine also how sectoral policies incorporate adaptation objectives in its policies targeting non-governmental actors, focusing specifically on the policy instruments. Typologies that characterize instruments according to their degree of authoritative force or coercion are used (Vedung 2007; Schneider and Ingram 1990). Therefore, one can distinguish between rules, incentives and information, the latter including also attempts to persuade. In general, following the literature, one can assume that the greater the conflict between adaptation objectives and other sector objectives, the greater the need for coercive instruments. But even where adaptation objectives are consistent with other sector policies, it is conceivable that multiple objectives will crowd each other out, unless the policy instruments put in place to promote climate adaptation are appropriate for forcing attention to adaptation objectives.

3.2 Coastal areas and coastal policies

Coastal areas have been identified as being sensitive to climate change and therefore the integration or climate proofing of coastal policies is of particular interest. This Section explores what the integration of climate adaptation concerns can mean in a coastal context and the possibilities and needs that exist for integrating adaptation into current and forthcoming EU policies.

3.2.1 Key coastal challenges related to climate change

Coastal areas maintain and support numerous socio-economic activities and are important in socio-cultural value systems. Some activities can be classified as the use of coastal ecosystem services whereas others make use of the physical environment as space or for the extraction of raw materials. Depending on the activity climate change has different impacts and will invoke different demands on adaptation (Table 3.2).

The following overview shows the diversity of the impacts and the possible responses (Table 3.2). Local conditions will determine the relative importance of different types of impacts. Thus sea level rise will seriously affect coastal areas that are already experiencing erosion or sea water intrusion. Similarly changes in the frequency and severity of storm surges will have the greatest impact on low lying coastal areas where land use patterns have led to the establishment of infrastructure, housing and other assets close to sea level. Other areas are likely to be more resilient to direct physical impacts but may suffer socio-economic consequences through impacts to fisheries caused e.g. by changes in species distribution and the productivity of marine resources. Furthermore, climate change may have broader socio-cultural impacts impacting *inter alia* perceptions of increased exposure or vulnerability.

Table 3.2. Overview of coastal activities and use of coastal ecosystem services and their links to climate change and possible adaptation activities.

Coastal activities	Potential impacts of climate change	Possible adaptation responses
Exploitation of living resources		
The exploration of biodiversity for commercially valuable genetic and biochemical resources	Changes in species distribution, physiology or productivity.	Assessment of production potentials and adjustment of the intensity and focus of exploitation; Integrated Coastal Management (ICM)
Capture fisheries (Commercial and recreational)	Changes in species distribution, species interaction or productivity.	Adaptive management, Maritime Spatial Planning – Integrated Coastal Management (MSP-ICM)
Marine aquaculture	Spatial change in conditions for production.	Productivity estimates, MSP-ICM for spatial location

Extraction		
Use of sea water for the production of fresh water suitable for human consumption or irrigation	Little or no climate impacts, except possibly through increased demand in drought stricken coastal areas or areas with salt water intrusion.	MSP-ICM for location of production units
Maritime works (dredging and seafloor mining)	Extreme climatic conditions.	Adjustment of safety standards to take into account any change in probability of extreme events
Offshore industrial and fossil energy activities	Extreme climatic conditions.	Adjustment of safety standards to take into account any change in probability of extreme events
Use of space and physical modifications of coastal habitats		
Coastal housing and land transport infrastructure	Sea level rise, erosion, coastal floods, storm surges.	Protective physical structures, land use and planning (MSP-ICM), civil protection and warning systems.
Coastal industrial installations	Sea level rise, erosion, coastal floods, storm surges.	Protective physical structures, land use and planning (MSP-ICM), civil protection and warning systems. Risk assessment (industrial accidents and natural hazards)
Maritime transport, safety and security	Seal level rise, extreme climatic conditions.	Protective physical structures, safety issues, warning systems, accidents and spills, MSP-ICM.
Coastal and cruise tourism and recreational use	Weather conditions, changes in ecosystems.	Safety and risk estimates, infrastructure development.
Pipelines and cables	Little or no climate impacts, except for increased spatial demand related to renewables and physical impacts on habitats.	Relevant as part of MSP-ICM
Production of wind or wave energy	Extreme climatic conditions:	Safety issues, demand for space and physical impacts on habitats handled in MSP-ICM.
Coastal protection	Extreme climatic conditions.	Physical protective structures, safety issues, warning systems. MSP-ICM

Protection of natural and cultural heritage and diversity		
Nature conservation	Changing habitats and species distributions, acidification of marine waters. Impacts of extreme climatic events.	MSP-ICM, Planning of nature conservation.
Maritime heritage	Changing conditions for maintenance and protection, sea level rise, extreme climatic events	Protective infrastructures, MSP-ICM

3.2.2 Adaptation in coastal EU policies

The numerous coastal activities that have links to climate change (Table 3.2) imply that a wide range of policies ranging from fisheries to renewable energy production and land use are potentially relevant from the point of view of adaptation to climate change. The way in which these policies affect coastal activities and their mode of governance differ (i.e. whether decision makers use more coercive, communicative or competitive approaches to promote adaptation activities (Knill and Lenschow, 2005). The EU competences also differ between sectors. Therefore the conditions for and type of integration of climate change will vary.

As noted above, adapting to climate change involves engagement with a large number of policies, policy instruments and related stakeholder interests at the EU-level, exemplified in the case of coastal policy by Figure 3.1. The identification of coastal policies is not immediately obvious due to the fact that coastal zones are affected by the regulation of both land- and sea-based activities across a range of sectors. Here a pragmatic approach has been taken, identifying policies as coastal when they significantly regulate, guide or support important activities in the coastal zone. They can be broadly divided into general policies for the use of coastal resources or development of coastal activities, protection of biodiversity and ecosystems, prevention of pollution, protection and management of waters, transport policies, tourism, procedures for environmental protection and planning and international conventions. The policies include to various degree and in different combinations rules, incentives and information for steering activities.

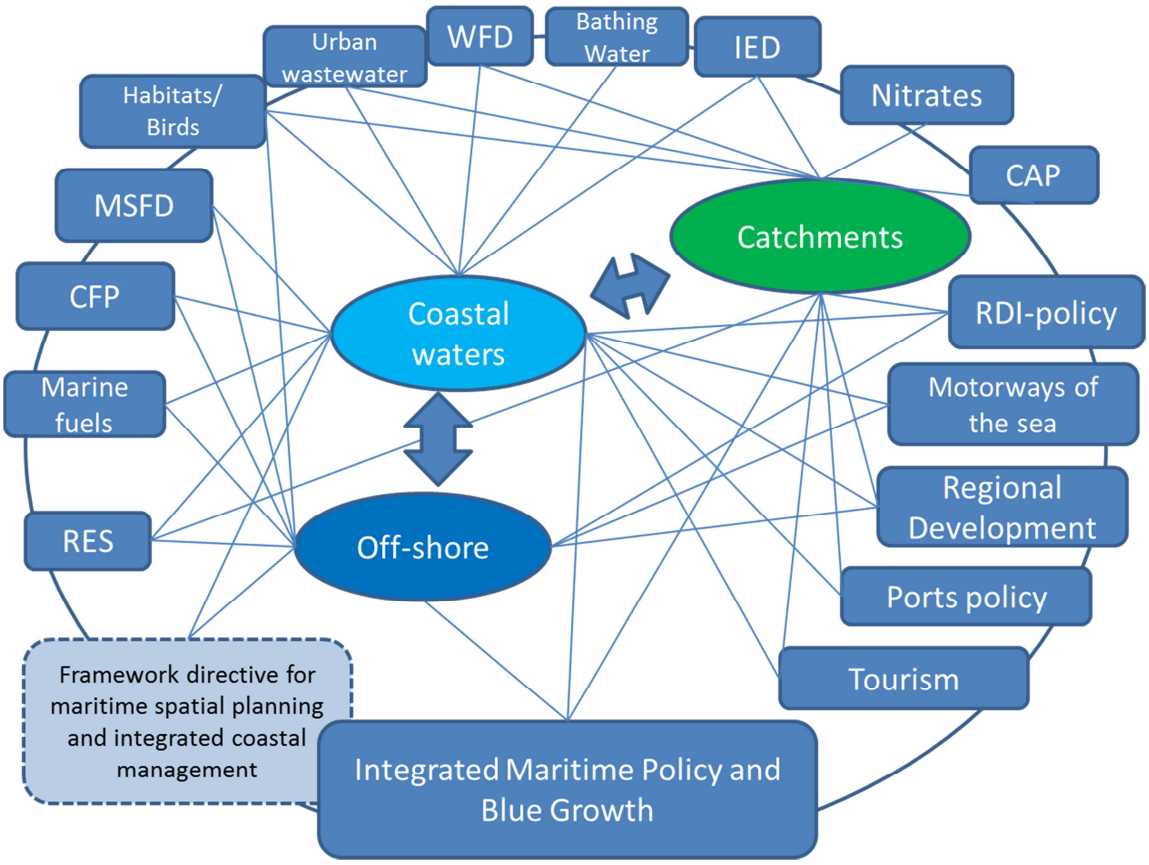

Figure 3.1. A selection of policies and policy instruments related to the land-coast-sea nexus and their interactions. The framework directive for maritime spatial planning and integrated coastal management is a proposal that is debated in the Council and the Parliament.

Note: The boxes refer to EU-level policies and directives. For a list of the acronyms, see Appendix 1

3.2.3 General policies

All general policies adopted after 2010 fulfil the basic criteria of 'inclusion' in that they refer to the existence of climate change and recognise the need for action to adapt to its impacts (Table 3.3). Policies adopted in early the 2000s did not have a natural policy reference as the Green Paper on adapting to climate change in Europe was only published in 2007 (COM(2007) 354 final).

Issues of consistency are not generally taken into consideration except for the Common Agricultural Policy (CAP) where climate change objectives and cross compliance issues have been explicitly raised (see Section 3.3). Explicit reference to weighting has so far only been introduced in the (draft) regional and cohesion policies. Reporting obligations are found in those policies which distribute funds. The European Maritime and Fisheries Fund (EMFF) is fully focused on coastal areas, but also other funds are likely to be applied in coastal regions. In the funds the reporting obligation on adaptation will arise as a consequence of the general reporting obligation and any explicit adaptation objectives that have been introduced at the operational level. This means that there will not be a general reporting on the change in, for example, adaptive capacity, but a reporting on specific adaptation activities that have been initiated.

The policy instruments range from soft to hard, but many are based on economic incentives to private actors. Integration therefor implies funding criteria with a process focus that ensures the application of the criteria in the everyday implementation. The output will thus be in terms of decisions that explicitly refer to adaptation and the reporting in place will be able to identify it. Evaluating the change in adaptive capacity is, however, a more difficult task, and it is not likely that the existing monitoring requirements will be able to do it. Separate evaluations are called for.

Table 3.3. Climate change aspects in general policies for the use of coastal resources and development of coastal activities.

Policy or policy instruments	Fulfilment of integration criteria (see Table 3.1)
Roadmap to a resource efficient Europe (COM(2011) 571)	Need for adaptation to climate change recognised, but no consideration of conflicts with other goals, no specific weighting or reporting obligations.
Programme to support the further development of an Integrated Maritime Policy (Regulation (EU) No 1255/2011); Integrated Maritime Policy work programme 2011-2012 (C(2012) 1447 final); Blue Growth (COM(2012) 494 final)	The general policy documents include recognition of needs for adaptation, but do not explicitly consider conflicts with other goals, specific weighting or reporting obligations. The work programme (2012) allocates resources with specific objectives to improve adaptation, including task to improve reporting.
Directive on the Promotion of the Use of Energy from Renewable Sources (2009/28/EC)	No explicit recognition of needs to adapt to climate change.
Common Agricultural Policy (CAP) COM(2010) 672 final COM(2011) 628 final/2; COM (2011) 625 final/2; COM(2011) 627 final/2	Explicit reference to the need for adaptation to climate change which is included in one of the key objectives. Recognition of need for specific instruments and coherence in policies. Reporting obligations will include actions for mitigation and adaptation.
Common Fisheries Policy (CFP) and related legislation (Council Regulation 2371/2002, revision 865/2007, financial regulation 861/2006; Shellfish Water Directive 2006/113/EC; European Eel Fishery Regulations 1100/2007; Aquaculture Animal Health Directive 2006/88/EC); European Fisheries Fund Axis 4	The original Council Regulation (2002) makes no reference to adaptation, nor does the financial regulation of 2006. The European Fisheries fund (2006) refers only obliquely to general adaptation to conditions “The Community fishing fleet should be adjusted in order to adapt it to the available and accessible resources. “ Climate Change is, however, recognised in "User's guide" to the CFP12 making reference to the implementation of the Integrated Maritime Policy. No reporting obligations on adaptation. The forthcoming European Maritime and Fisheries Fund (EMFF) will recognise adaptation as it is a general requirement for all new structural funds.
Regional Development and Cohesion Policy, Territorial Agenda 2020	Need for adaptation to climate change recognised, general processes exist for weighting of goals. Thematic objective identified as “Promoting climate change adaptation and risk prevention and management”, specific weighting of climate change (mitigation and adaptation) at the level of resource use. Reporting obligations will thus take effect.

[12] EC 2008. The Common Fisheries Policy - A user’s guide. http://ec.europa.eu/fisheries/documentation/publications/pcp2008_en.pdf [Visited August 18 2013]

3.2.4 Protection of biodiversity and ecosystems

Policies related to the protection of biodiversity and ecosystems demonstrate the recent recognition of adaptation to climate change. For example, the biodiversity strategy of 2011 has included adaptation as a specific issue whereas the key Habitats and Birds Directives were adopted long before adaptation was recognised as a policy issues and consequently make no reference to climate change or adaptation (Table 3.4). The Directives do, however, include detailed reporting obligations and one can foresee that adaptation will become part of the reporting. This gradual adoption of climate change as a relevant issue can be seen in the 2011 material for reporting under Article 17 of the Habitats Directive. The "list of threats and pressures" has been updated to include climate change, although the "list of conservation measures" (as approved 28.04.2011) does not yet include adaptation to climate change as a specific measure, although some of the conservation measures can conceivably be justified as adaptation measures.[13] This is an example of how the legislation can respond to new demands and focus knowledge production on particular aspects. In the light of the general discussion on climate change it is easy to understand that knowledge demand has first focused on impacts.

The policy instruments for biodiversity rely heavily on planning (Natura 2000) and information in the form of monitoring and reporting. There are also strong regulatory elements for habitats and species that have been explicitly recognised, but it is not obvious how adaptation would be integrated in the relevant decision making.

The preparation of management plans for sites, habitats and species can be seen to be an aspect of governance where adaptation can be naturally integrated. The output would be plans that pay due attention to adaptation. For habitats and species the conservation status can be interpreted from the point of view of adaptive capacity, but the challenge will be how to determione the contribution of adaptation.

Table 3.4 Climate change aspects in policies related to the protection of biodiversity and ecosystems.

Policy or policy instruments	Fulfilment of integration criteria (see Table 3.1)
Our life insurance, our natural capital: an EU biodiversity strategy to 2020 COM(2011) 244 final	Need for adaptation explicitly recognised and included also in targets with reference to coastal systems "This could include restoring marine ecosystems, adapting fishing activities and promoting the involvement of the sector in alternative activities". Potential tensions with other objectives are recognised, but no explicit weighting. No specific reporting obligations.
Habitats (79/409/EEC) and Birds (2009/147/EC) Directives	No explicit recognition of climate change. Some formulations allow for readjustments if changes are observed, but no reference to likely future change or other adaptive measures. Management plans may, however, represent flexible instruments for designated areas. Many of the coastal and marine habitats listed in Annex I are likely to be sensitive to the effects of climate change. Article 17 requires detailed reporting, including reporting on threats and pressures.

13 http://bd.eionet.europa.eu/activities/Reporting/Article_17/reference_portalhttp://bd.eionet.europa.eu/activities/Reporting/Article_17/reference_portal [Visited September 27 2013]

3.2.5 Prevention of pollution and the protection and management of waters

In the field of environmental protection, one can argue that many of the generic approaches, such as the demand for risk assessment or detailed reporting on measures to reduce pollution allow for monitoring of adaptation, although these demands have so far been "silent" with respect to climate change. Legislation that is more management-oriented (WFD, MSFD, Floods Directive) already actively addresses climate change and adaptation. The governance process in the Water Framework Directive also demonstrates that a new topic such as adaptation can be taken on board in the implementation phase. Climate change and adaptation are not referred to in the original directive, but have become important in the implementation (EC, 2009). Also considerations of issues related to consistency and weighting have arisen (Table 3.5). In contrast to the purely impact oriented knowledge demand of, for example, biodiversity policies, the demand for knowledge in recent water policies also focuses on the adaptive action.

The policy instruments in the water sector are strongly ruled based, coupled with information based planning. In planning it is fairly easy to integrate adaptation, it is an additional aspect to be included. In the rule based instruments it is slightly more difficult to see how adaptation would change the decision making in practice, except in the cases where risk assessments are mandatory.

The governance processes include already now output specification for some areas and the outputs are easy to define as, for example, climate proofed River Basin Management Plans or risk assessments that recognise climate change. The translation of these outputs to outcomes in the form of increased adaptive capacity is more difficult. Current routine monitoring is not likely to provide sufficient information.

Table 3.5 Climate change aspects in policies related to the prevention of pollution and the protection and management of waters

Policy or policy instruments	Fulfilment of integration criteria (see Table 3.1)
Directive on industrial emissions 2010/75/EU (IED) and its predecessor (IPPC Directive 2008/1/EC)	No explicit recognition of climate change, but mandatory action to deal with potential changes in risks in general. The dynamic nature of mainly industrial activities is recognized and many provisions deal with changes that are assumed to arise due to actions of the operator. Depending on the nature of the change some adaptive actions may also qualify, if they can be expected to have an effect on the level or type of pollution that the activity causes. Issues of consistency or weighting are not raised. The reporting questionnaire according to the Commission Decision 2010/728/EU makes no reference to adaptation, but mitigation is recognised.
Regulation on European Pollutant Release and Transfer Register (166/2006 EC) (E-PRTR)14	The register is generic and provides information on river basins, but does not explore causes of releases or ways to prevent them.
Directives on Chemical Accidents (Seveso II, 96/82/EC, Seveso III 2012/18/EU) - Prevention, Preparedness and Response	No explicit recognition of climate change, but extensive treatment of changes in activities and installations. Article 11.4: Member States shall ensure that internal and external emergency plans are reviewed, tested, and where necessary revised and updated by the operators and designated authorities at suitable intervals of no longer than three years. Article 12 of the Seveso II Directive and Article 13 of Seveso III require Member States to ensure that the objectives of

[14] http://prtr.ec.europa.eu/ [Visited October 15 2013]

	preventing major accidents and limiting the consequences of such accidents are taken into consideration in their land-use planning policies. Issues of weighting or conflicting objectives are not raised. Guidance documents on reporting are generic without explicit reference to climate change. The road map report (Basta et al., 2008) makes one reference to climate change in a footnote.
Directive on Environmental Quality Standards (Directive 2008/105/EC) and Dangerous Substances Directive (67/548/EEC + updates)	No reference to climate change or adaptation. Generic requirements to monitor levels.
Thematic strategy on air pollution COM(2005) 446 final and Impact assessment SEC (2005) 1133; Directive 2005/33/EC amending Directive 1999/32/EC as regards the sulphur content of marine fuels;	The thematic strategy recognises climate change issues, including synergies, but exclusively from a mitigation point of view. No consideration of conflicts between objectives or weighting. Reporting does not include adaptation to climate change.
Water Framework Directive (2000/60/EC; 2008/32/EC)	No explicit recognition of climate change in the directive itself, but subsequent implementation takes climate change explicitly into account. A special Guidance Document (EC, 2009) makes extensive reference to climate change and adaptation, including coastal areas. Consistency and weighing issues are raised, with demand for robust and low regret measures. In the Work Programme 2010-2012 coastal areas and ICZM are, however, hardly mentioned. The monitoring required in Article 8 (Monitoring of surface water status, groundwater status and protected areas) should provide information ex-post on the progress of climate change, and also on adaptation.
Water quality regulation: Urban Waste Water Directive (91/271/EEC; amendment 98/15/EEC); Nitrates Directive (91/676/EEC); Management of Bathing Water Quality (2006/7/EC)	No reference to climate change or adaptation. Generic requirements to monitor.
Marine Strategy Framework Directive (2008/56/EC)	Climate change is recognised explicitly. Article 17 (Updating) and Article 24 (Technical adjustments) ensure that the programmes and specific details are kept up to date. Many of the variables in Annex III (Indicative lists of characteristics, pressures and impacts) are expected to react to climate change. No consistency or weighing issues are raised. The reporting guidance[15] refers to climate change, but not to adaptation.
Floods Directive (2007/60 EC)	Climate change is recognised. By 2015 flood risk management plans must be drawn up for these zones. These plans are to include measures to reduce the probability of flooding and its potential consequences. Reference is made to the EC Guidance Document (2009). Consistency and weighing issues are raised, with demand for robust and low regret measures. Reporting will cover adaptation action.

[15] http://icm.eionet.europa.eu/schemas/dir200856ec/resources [Visited September 28 2013]

3.2.6 Transport policies and tourism

Climate change is potentially very important for the transport sector. Investments are large and made for the long-term. Coastal transport is no exception. A few year old maritime transport policy documents do not mention climate change, but the situation is changing with the new TEN Regulation (Table 3.6). In the tourism sector climate change has been recognized, but actual adaptation measures are not driven by the European tourism policy.

The demand for knowledge related to climate change has been focused on potential impacts, but with the new TEN-regulation one can expect increasing demand for knowledge on how adaptation can be implemented in practice.

The policy instruments concerning transport and tourism are information and incentive based. The governance of the integration of adaptation will thus be oriented towards rules and standard operating procedures. For the TEN-network output can be concretely measured in relevant decisions that integrate climate change considerations and outcomes can be judged in terms of the level of climate risk that can be associated with the infrastructure. For coastal tourism an integrated output is vague. The is no routine information production on the adaptive capacity of coastal tourism, but it can be inferred from other variables relevant for the built environment such as use of water or sensitivity to extreme climatic events.

Table 3.6 Climate change aspects in policies related to transport and tourism.

Policy or policy instruments	Fulfilment of integration criteria (see Table 3.1)
Trans-European transport and mobility networks Regulation 680/2007/EC; Decision 661/2010/EU; Proposal COM(2011) 650 final/2 - Agreement reached May 2013	The Regulation of 2007 and the Decision of 2010 make no reference to climate change or adaptation. In contrast the new regulation makes explicit reference to adaptation (Article 41, Climate change proven infrastructure and disaster resilience). Reference is also made to the consistency with other legislation. No weighting is mentioning. In the new regulation reporting is generic, but future reporting can be expected to also include reference to Article 41.
Communication and action plan for a European maritime transport space without barriers (COM (2009)10)	Reference to climate change mitigation, no references to adaptation.
Communication from the Commission on European Ports Policy (COM(2007)616)	No reference to climate change, nor adaptation. Risk and environment and consistency issues noted, but no reflection on links to climate change.
Europe, the world's No 1 tourist destination – a new political framework for tourism in Europe(COM(2010) 352	Climate change impacts and need for adaptation are explicitly recognized. No consistency or weighing issues are raised. No explicit reporting obligations.

3.2.7 Procedures for environmental protection and planning and international conventions

General procedural regulations are expected to set the framework for processes that help to achieve consistency and appropriate weighting of conflicting objectives. In the EIA and SEA legislation adaptation to climate change is not identified explicitly, as they are “old” relative to the policy debate on adaptation. In the Integrated Coastal Zone Management (ICZM) recommendation and the proposed MSP-ICM framework directive (Table 3.7) adaptation is reflected. Interestingly the evaluation of the ICZM recommendation (EC, 2007), which appeared at the time of the Green Paper

on adaptation already stressed the need for adaptation, although it did not provide evidence of successful progress.

The key international conventions for the European seas have all explicitly recognized climate change as a topic and organized events and produced plans and reports dealing with adaptation. The ICZM protocol of the Barcelona Convention has led to an Action Plan that sets up processes for developing adaptation options (Table 3.7).

The knowledge needs expressed in the legislation have focused on impacts, but the most recent developments show increasing demand for knowledge of action related to adaptation.

The policy instruments are primarily information based oriented towards planning. For these integration of adaptation can be achieved through rules and standard operating procedures that make climate change aspects visible. The outputs can reflect adaptation, but there is no one-to-one relation to adaptive capacity. The outcome will depend heavily on the true awareness of the need for adaptation.

Table 3.7 Procedures for environmental protection and planning and international conventions.

Policy or policy instruments	Fulfilment of adaptationintegration criteria (see Table 3.1)
Environmental Impact Assessment (85/337 EC; amendments 97/11/EC; 2003/35/EC)	Future climate should in principle be recognised as part of the requirement to cover "the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme;"(Article 5(1), Annex I.) Plans and programmes for adaptation would be covered by the directive if they fulfil the general criteria according to Article 3. Consistency and weighing issues are assumed to be dealt with in the process. No explicit reporting obligations related to adaptation.
Strategic Environmental Assessment (2001/42/EC)	Article 3: "...environmental impact assessment shall identify, describe and assess... direct and indirect effects...on ... climate...". Also adaptation can be considered as there is a requirement to analyse the interaction between factors. Consistency and weighing issues are assumed to be dealt with in the process. No explicit reporting obligations related to adaptation.
ICZM recommendation (2002/413/EC)	Climate change is recognised. Adaptation to climate change is not explicitly elaborated, but the central elements of the strategic approach include many principles of effective adaptation to climate change.
Proposal for a Framework Directive for maritime spatial planning and integrated coastal management COM(2013) 133 final	Climate change and adaptation explicitly recognised. The Directive is assumed to increase consistency and lead to appropriate weighing in “enabling diverse and sustainable uses of marine and coastal resources by considering the economic, social and environmental pillars of sustainability in line with the eco-system approach” (Legislative financial statement 1.4.3. Expected result(s) and impact)
International conventions	
Regional Seas Conventions (OSPAR, HELCOM, Barcelona Convention, Black Sea Convention)	All of the international conventions concerned with European coastal seas have explicitly recognised climate change and adaptation to climate change. Issues of consistency, weighting and reporting are set within the normal operating frame of the conventions. The ICZM protocol of the Barcelona Convention and the adopted Action Plan (2012-2019) Decision IG 20/2 “6.1.1.6 Assessment of environmental and socioeconomic impacts and adaptation options in two critically vulnerable sites, and evaluation of response options” is an example of a specific consistency consideration and weighing issue.

3.2.8 Discussion on integration of adaptation in coastal policies

CPI as an output

In Section 3.1 criteria for examining climate adaptation were outlined on the basis of: whether climate change adaptation goals are *included* in the policy; whether climate adaptation goals are *consistent* with other policy goals; weather the relative *priorities* of climate adaptation objectives had been assessed alongside other goals; and whether *reporting* processes are in place based on evaluations of the policy.

The overview of sectors, policies and instruments in Sections 3.2.3-3.2.7 demonstrate that climate change and the need for adaptation have been widely recognized and included at the level of general objectives. A clear temporal shift can be seen. The overview of coastal sectors and activities shows that policies and policy instruments released before 2005 show hardly any recognition of climate change and issues related to adaptation. Policy documents formulated after the Green Paper in 2007 show growing recognition of adaptation and those that have been established or revised after 2010 almost unanimously make reference to climate change and adaptation. In this respect adaptation has been successfully integrated in a wide range of policies that are significant for activities in coastal zones (cf.Section 3.2.2). This suggest that the efforts manifested in the EU white paper on adaptation (COM(2009) 147 Final) and the EU adaptation strategy (COM(2013) 216 final) have succeeded in this dimension of integration (Table 3.8). The emergence and maturation of EU climate adaptation policy and the inclusion of adaptation objectives in the marine sector thus appear correlated.

The inclusion of a reference to climate change and the need for adaptation is relatively easy. It cannot be considered as a sufficient evidence or goal of integration. The recognition of consistency, trade-offs and the explicit weighting of actions (Table 3.1) is more challenging as they bring the integration into the actual activities. The overview suggests European coastal policies are only beginning to raise these issues (Table 3.8). The need for such reflection is most obvious in policies distributing funds, such as the structural funds, and in instruments dealing with and regulating management such as the WFD and the Floods Directive. Interestingly it appears that transport policies have been relatively late in seeing the need to adapt although information on, for example, costs and benefits of adaptation is well developed for coastal areas (Brown et al., 2011; Hof, 2013). This suggests supports earlier findings of the lack of a direct link between knowledge production, knowledge use and policy development.

Active knowledge production and focused reporting on climate change and adaptation tends to emerge in those policy areas where matters of consistency and weighing have already become apparent (Table 3.8). General information on climate change impacts is relatively easy to obtain and there are numerous studies available on impacts (EEA, 2012). This knowledge has been widely used in the political argumentation for policies. It is reflected in, for example, the extensive citation of impact studies in the Commission staff working document (Climate change adaptation, coastal and marine issues SWD(2013) 133 final) justifying the coastal aspects of the Adaptation Strategy. Knowledge production and use of knowledge on measures actually undertaken and on exploration of alternatives are scarcer. The important question is to what extent the EU adaptation strategy can encourage the production of new types of knowledge that would lead to practical action and also greater consistency and appropriate weighting of adaptation action in coastal policies.

Table 3.8 Summary based on Tables Table 3.3-Table 3.7 relative to the integration criteria of Table 3.1.

Policy area	Inclusion	Consistency	Weighting	Reporting
General coastal resources and development of coastal activities	All recent	Broad general policies do not deal with consistency issues. In focused policies such as CAP consistency is raised as a general issue	Policies distributing funding such as structural funds include weighting issues, others not	Reporting primarily related to distribution of funds
Protection of biodiversity and ecosystems	All recent	General reference to consistency issues	No explicit weighing	Generic reporting increasingly tuned to include climate change
Prevention of pollution and the protection and management of waters	Recent instruments tend to include reference to climate change, except those focusing purely on emissions	Pollution oriented instruments do not raise issues of consistency, management oriented do	Pollution oriented instruments do not consider weighting, management oriented raise the issue	Management oriented instruments increasingly include adaptation issues
Transport and tourism	All recent	Limited reference except for new TEN-regulation	No references	Currently none, future reporting on TEN-likely to cover topic
Procedures for environmental protection and planning and international conventions	Generic implicit inclusion, recent explicit references	Consistency issues identified on a general level	Some focused activities consider weighing	Topics included at a general level

Adaptation as a process

While output and outcome indicators suggests that climate change adaptation is being mainstreamed in marine and coastal policies, the analysis in this section shows that there is little in the way of a coherent set of tools and mechanisms to facilitate within sector and inter-sector integration. Indeed evidence of such processes are far and few between. Note some rare examples though, such as special guidance documents on adaptation for the Water Framework Directive, targets on adaptation in EU Biodiversity Strategy among others. Crucially, Figure 3.1 above demonstrates the complex web of interacting policies that make up the EU's suite of coastal policies. In the absence of a set of consistent set of mechanisms to support integration across these policies (see Shout and Jordan 2008) there is danger of incoherence, and inconsistency. This situation can lead to a heightened risk of conflict between adaptation and other policy objectives,

and lost opportunities for exploring synergies between the policies. Or that some policies and actors they target do not deal with adaptation issues at all.

The EU's system of impact assessment for legislative proposals and strategies is one mechanism that can in principle be employed to pursue integration more coherently. Not only is an impact assessment a specified output (see section 3.1) from the EU policy making processes, it is also tied into a set of standard operating procedures and bureaucratic rules (see section 3.1.) generating expectations about knowledge synthesis and generation through impact assessment, and the sharing of the knowledge with other sectors and stakeholders through consultations (Turnpenny et al, 2008) to inform policy making. The impact assessment process is, however, on its own unlikely to be sufficient for ensuring coherence and integration at the practical level, unless backed up by strong interservice consultations.

Beyond impact assessments, which deal with policy level links, there appears to be an understanding that more operational knowledge and thus research is needed to integrate climate change into coastal policies. For instance the Adaptation Strategy and the accompanying staff working document on coastal and marine issues (SWD(2013) 133 final) place heavy emphasis on improving the knowledge base along the lines of the Green Paper on Marine Knowledge 2020 from seabed mapping to ocean forecasting (COM(2012) 473 final). The Green Paper is, however, primarily oriented towards improving the data on the state of the sea and coastal areas. Such information will improve the long-term knowledge base for actions but will not solve issues of weighting and consistency. For these problems the staff working document (SWD(2013) 133 final) relies heavily on a common implementation process for the WFD, MSFD and Floods Directive. This is likely to be a critical test for the success of the Adaptation Strategy in coastal waters. The Commission also stresses the need for climate change to be recognized in the proposal for a framework directive on Maritime Spatial Planning and Integrated Coastal Management (COM(2013) 133 final) and in planned guidelines on adaptation and coastal zone management (2014). The proposed Directive is foremost a planning and coordination instrument and some countries have opposed it on the grounds that it interferes with too many existing activities, whereas others welcome its coordinating role in the hope that it could help to solve current issues of consistency.

In addition to enhancing knowledge production through monitoring or new planning tools, the staff working document (SWD(2013) 133 final) indicates that the Commission could consider further support to Member States and regional and local authorities in implementing climate-proofed policies in coastal and marine areas. Green infrastructures are highlighted as particularly beneficial. Potential funding for such activities is emerging in the forthcoming structural funds. These funds can generate interesting experiments and pilot activities. One challenge will be to reap the benefits of all the separate activities and experiments that may emerge. There is thus an emerging need to analyse, evaluate and synthetize new information that the activities will generate.

The Commission also has a strong belief in the benefits of information-sharing portals and has provided funding for a project on the sharing of best practices on Integrated Coastal Zone Management (ICZM), in the context of adaptation to climate change in coastal areas (ENV.D.2/SER/2012/0037). This analysis has shown that the greatest challenges for the integration of adaptation at a policy level lie in the area of policy consistency and weighting of interests. This is likely to be true also for policies and activities in Member States, and regional and local activities. Care must therefore be taken not only to create collections of experiences, but also to set up a framework that allows for a systematic analysis of salient features of the experiences. In practice, this means that there is a need not only for setting up portals, but in particular for detailed analyses of cases and how they can contribute to a general development of adaptation in coastal regions.

Notwithstanding this prioritisation of synthesising existing data and commissioning new research to fill knowledge gaps, there is no guarantee that this knowledge or the results of an impact assessment will influence a final policy outcomes because of, for example, competing political priories, a lack of expertise, a lack of appropriate knowledge for the issue at hand, a mismatch between the time frames of policy and the time needed to collect robust data among other things (e.g. Hertin et al 2009; Nilsson et al 2008, Weiss 1979). Thus, processes such as impact assessment need to be supported by others (Jordan and Lenschow 2008) such as hierarchy to compel policy makers to share information or integrate adaptation objectives in their final policy in a coherent manner, staff training to enhance capacity, etc. In the case of coastal policy, such supporting processes are conspicuously absent, thus augmenting the risk of policy conflict and minimising opportunities to explore synergies between polices and adaptation objectives.

3.3 Agricultural policies and cohesion policy

Agriculture is a key sector for EU policies and politics. It is therefore natural that it has also caught attention in the context of adaptation. The following sections explore the relevant policy issues that arise in attempts to integrate adaptation into agricultural and related policies.

3.3.1 The key challenges for agriculture

A large body of literature suggests ongoing and continuing climate change (Opdam et al., 2009; Loë et al., 2001; Kingsford and Watson, 2011), involving both longer-term shifts in temperature patterns and rainfall regimes as well as greater seasonal variability and more frequent extreme weather events. Agro-ecosystems in Europe and elsewhere are sensitive to these changes (Maracchi et al., 2005; Olesen and Bindi, 2002; Schaap et al., 2011; SWD (2013) 132 final). Shifts in temperature and precipitation, and the subsequent alteration of abiotic factors such as water systems hydrology, soil characteristics, and nutrient cycles, will affect their suitability for farming activities and possibly their capacity to support food production, deliver wider ecosystem services and sustain biodiversity.

Overall climate change impacts on agricultural productivity such as crop yields, crop distributions and animal health through changes in water availability, flooding, storms, soil erosion and pests and diseases. But observed climate change impacts on European agriculture reveal regional differences. Opportunities arise in northern Europe such as the northward expansion of areas suitable for several crops and increased yields of other crops mostly as a result of favourable conditions for longer growing seasons (Olesen and Bindi, 2002; Orlandini et al., 2008; EEA, 2012). However, this region does risk increased flooding and nutrient leaching, soil organic matter decomposition (Maracchi et al., 2005) as well as increased pests and disease expansion. Agriculture in the European south is challenged by reduced yields of some crops due to heat waves and droughts, increase in water demand for irrigation, risk of soil erosion and decrease in land suitability for crops (Orlandini et al., 2008; Reidsma et al., 2010; EEA, 2012). Furthermore, benefits from climate change will be limited in this region (Maracchi et al., 2005). Regional variations result from the changes in the mean values of temperature and precipitation and the extreme events (Iglesias et al., 2012) and are projected to continue in the future, including both positive and negative impacts (Olesen et al., 2011; Iglesias et al., 2012). Total crop productivity in Europe is projected to increase under moderate warming (Iglesias et al., 2012), as a result of higher CO_2 concentration, and the positive effect of warmer conditions in the European North (Maracchi et al., 2005). However, taking all climate change effects into account (i.e. crop yields, soil fertility pesticide use, nutrient runoff), agriculture is projected to be negatively affected in most parts of Europe (Olesen et al., 2011).

As EU policies have increasingly recast the agricultural sector in a multifunctional model, the role of farmland has expanded. In addition to ensuring the production of adequate and high quality food,

farmland is now expected to provide an array of public commodity and non-commodity ecosystem goods and services. The task of performing a range of functions and achieving multiple goals sometimes causes conflicts. In the case of agriculture, it is possible that these conflicts are further exacerbated due to the pressure from climate change. Increased pesticide application to combat pest expansion, for example, might exacerbate water pollution in areas where precipitation and subsequent runoff is projected to increase. Also decline of farmland biodiversity, e.g. bird population, (Randall and James, 2012; Donald et al., 2001) due to past changes in farmland management raises concerns about the ways that farmland biodiversity might be affected by the introduction of new crops that have a better response to drier and warmer conditions or the shift to more intensified farming systems that are less sensitive to climate change.

Whether or not mitigation efforts are undertaken, adaptation to the changing climatic conditions is now inevitable and of critical importance for agriculture. Responding to climatic variability and observed impacts is certainly not a novel task for farmers (Nightingale, 2009; Iglesias et al., 2012), who have always produced under variable weather patterns. Thus, adjustments in farm management such as changes in planting and harvesting dates, introduction of new crop varieties, diversification etc. are often carried out as short-term solutions to climate variability. The capacity to implement autonomous adaptation strategies, i.e. at farm scale is largely dependent on farm characteristics (Reidsma et al., 2010), access to financial resources and the possession of skills and knowledge. At a higher scale, e.g. regional or national, socio-economic, political, climatic and biophysical characteristics of different regions and non-climatic pressures that take place in parallel to climate change (e.g. competition in international markets, land-use change, air pollution, consumer preferences, demographic changes (e.g. Iglesias et al., 2007) may exacerbate the vulnerability of agriculture in certain areas and also affect the way the different regions or countries respond to climate change (Olesen and Bindi, 2002).

Given that climate change will increase the rate, scale and magnitude of climatic uncertainty, long-term adaptation is needed to reduce the negative impacts of climate change, to exploit the opportunities arising from it in different regions and to minimise the potential for mal-adaptation (for examples see Rounsevell and Reay, 2009; Fazey et al., 2010; Jones et al., 2012). This is a challenging task that will require changes based on cross-sectoral assessments of synergies and trade-offs. Thus, in addition to adaptation undertaken by farmers, collective responses will also be necessary either at sector level or at local, regional or national level. These include both area-wide strategies, infrastructure improvements, identification of vulnerable areas, research and information dissemination.

In order to meet this challenge, the EU adaptation strategy (COM(2013)216 final) calls for integration of climate adaptation objectives in EU agricultural policies (Climate Adaptation Strategy, Action 6). This is in alignment with the recommendation from COP-8 by the UNFCCC to ensure policy integration of climate change objectives into other policy areas (UNFCCC, 2002 as cited by Swart and Raes, 2007).

This section analyses policy output, i.e. how the adaptation strategy has influenced the recently reformulated agricultural policies as well as other policies that affect the multifunctional role of agriculture, including the main nature protection policies and the EU cohesion policy as far as it intersects with agricultural policy. The section also analyses the more general question of how agricultural policies incorporate adaptation objectives in order to assess the likelihood that integration of climate adaptation objectives will take hold be implemented on the ground, i.e. in actual sector. Finally, the section aims to analyze the use of knowledge and to identify knowledge gaps in the agricultural policy output.

3.3.2 Adaptation in agricultural policy and rural development

As mentioned, agriculture has been assigned a multifunctional role, extending beyond simple food production to delivery of a range of ecosystem services. Moreover, agriculture has traditionally been the focus of rural development, as evidenced in the inclusion of the rural development policy in the CAP. Thus, the policy regime relating to agriculture includes not only explicit agricultural policies, but also nature and water policies, which broadly define the potential contribution of agriculture to ecosystem services as well as the impact of agriculture on nature and the environment. Moreover, insofar as the EU Cohesion Policy aims to coordinate a range of policy areas, this policy is also relevant for agricultural policy and will be included here to the extent that it has implications for agriculture. Table 3.9 lists the key policy documents within each of these policy areas and sets out their main objectives.

Table 3.9 Overview of the main objectives of the policies and directives analyzed in this chapter.

Policies/ Directives	Legal Document	Main Objective
Common Agricultural Policy	COM (2011) 627 final/2	To ensure viable food production, sustainable management of natural resources and climate action and balanced territorial development.
Water Framework Directive	Council Directive 2000/60/EC	To establish a framework for the protection of inland waters, transitional waters, coastal waters and ground waters, which prevents deterioration and promotes sustainable water use, as well as contributes to mitigating the effects of floods and droughts.
Nitrate Directive	Council Directive 91/676/EEC	To reduce water pollution caused or induced by nitrates from agricultural sources.
Soil Thematic Strategy	COM (2006)232 COM(2012)46 final	To protect the soil while using it sustainably, through the prevention of further degradation, the preservation of soil function and the restoration of degraded soils.
EU biodiversity strategy to 2020	COM(2011) 244 final	Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss.
Habitats Directive	Council Directive 92/43/EEC	To contribute towards ensuring bio-diversity through the conservation of natural habitats and of wild fauna and flora in the European territory of the MS to which the Treaty applies. Whereas, the main aim of this Directive being to promote the maintenance of biodiversity, taking into account of economic, social, cultural and regional requirements, this Directive makes a contribution to the general objective of sustainable development.
Birds Directive	Council Directive 2009/147/EC	To conserve all the species of naturally occurring birds in the wild state in the European territory of the MS to which the Treaty applies. It covers the protection, management and control of these species and lays down rules for their exploitation. It shall apply to birds, their eggs, nests and habitats.

Cohesion Policy	Regulation (EC) No 1083/2006 (Currently being revised for 2014-2020: SEC (2011)1138 and 1139 final).	To strengthen economic and social cohesion by reducing regional differences in development. It operates through a number of funds, including the Cohesion Fund. The proposal for the 2014-2020 period aims to focus on a small number of priorities linked to the Europe 2020 strategy in order to improve effectiveness and in order to do this it sets out common provisions for a number of funding instruments, including the Rural Development Fund.

3.3.3 Common Agricultural Policy

At the EU level, Common Agricultural Policy (CAP) is the main policy dealing with agriculture. This policy consists of two parts, referred to as the first pillar, providing market and income support and setting out regulatory requirements and the second pillar, providing funding for rural development activities. Past experience has shown the potential of CAP to contribute towards the achievement of the goals that were set in different periods (i.e. food security). Hence, the potential of CAP to contribute towards adaptation is expected to be high. As mentioned in section 2.2 mainstreaming initiatives have taken place already in this sector. So far these were mainly in reference to specific agri-environmental priorities (e.g. water scarcity) (SWD(2013) 139 final) and linked to cross-compliance and the good agricultural and environmental conditions (GAEC). Adaptation has gained a more prominent role in the legal proposals for the CAP reform 2014-2020 (agreed in June 2013 and effective from January 2014). “Sustainable use of natural resources and climate action” was included in the core objectives of CAP, in conjunction with the “viable food production” and “balanced territorial development” (COM (2011) 625 final/2). Reference to climate change adaptation was made also in the specific objective No 3: “To pursue climate change mitigation and adaptation actions” (COM (2011) 625 final/2).

The structuring of the rural development programmes (RDP) around six priorities was one of the main changes of the rural development policy (SWD (2013) 132 part 2). Two of these priorities, “Restoring, preserving and enhancing ecosystems” and “Promoting resource efficiency and supporting the shift towards a low carbon economy in agriculture, food and forestry sectors”, are the most relevant to climate change adaptation. However, adaptation is expected to be considered in other priorities as well (SWD (2013) 132 part 2). Table 3.10 summarizes climate adaptation has been integrated into agricultural policies, according to the criteria set out in section 3.1.

The integration of climate adaptation objectives in agricultural policies is supplemented by policy instruments targeting private actors, most notably farmers. These include both financial incentives as well as rules. Firstly, 30% of Pillar I direct payments will be allocated to farmers applying compulsory green measures (‘greening payment’) (SWD (2013) 139 final) to ensure that all farmers receiving direct payments deliver environmental and climate benefits (COM (2011)625 final/2). According to the proposal this implies that farmers, in order to receive the full direct payment, must provide environmental and climate benefits beyond that which is required through cross compliance (ibid). Specific activities include retention of soil carbon and grassland habitats associated with permanent pasture; water and habitat protection by the establishment of ecological focus areas and improvement of the resilience of soil and ecosystems through crop diversification (ibid: 3). This greening of the direct payments adds to the incentive approach already implemented through the cross-compliance mechanism, which stipulates that farmers must comply with specified environmental regulations in order to be eligible for the income support. This includes a number of key regulatory areas such as pesticide, nitrate and water regulation. In fact, cross compliance will be

further focused to provide protection for wetlands and carbon rich soils (COM (2011) 625 final/2, p3). In this manner rules are combined with and strongly backed by economic incentives.

Table 3.10 Integration of climate adaptation in agricultural policies.

Policies/ Directives	Adaptation criteria: inclusion, consistency, weighting, reporting
CAP COM (2011) 625 final/2 COM (2011) 627 final/2 COM (2011) 628 final/2	*Objective 2* of the CAP *Sustainable management of natural resources and climate action* explicitly includes climate adaptation. *Inclusion* Climate adaptation has been included in the specific objectives of the Single Market Scheme (COM (2011) 625 final/2) and the Rural Development Programme (COM (2011) 627 final/2). *Consistency and weighting* The policy proposal is based on an impact assessment which compared three scenarios. The regulation explicitly discusses the balancing of different objectives and it concludes that the so called integration scenario 'is the most balanced in progressively aligning the CAP with the EU strategic objectives', while others scenarios do not adequately meet climate and environmental challenges. While the policy does not assign weights to greening vs. other objectives per se, it does increase the weight given to greening objectives, including climate objectives. Hence, climate adaptation objectives are included in the CAP, consistency among policy objectives is considered, but weighting of climate adaptation objectives vis-à-vis other objectives is not explicitly given. *Reporting* Monitoring and evaluation obligations include assessment of CAP measures in relation to the policy objective of sustainable management of natural resources and climate action measures (COM (2011) 627 final/2). Moreover, member states are required to report on climate adaptation measures in the Partnership Agreements to be submitted to the commission, outlining the implementation of the structural funds, including the Rural Development Programme.

As far as the second Pillar II (rural development policy) is concerned, a stronger focus is now placed on environmental and climate related objectives. The programme provides financial support to farmers or rural areas for specific purposes. The objectives of the sustainable management of natural resources and climate action have been prioritized in the current proposal through the restoration, preservation and enhancement of ecosystems as well as the promotion of resource efficiency, low carbon and climate resilient agriculture. According to the proposal (COM (2011) 627 final/2) rural development funding will contribute towards the completion of the implementation of both the Natura 2000 and Water Framework Directives and to the achievement of the EU's 2020 biodiversity strategy (COM (2011) 625 final/2: 3). Thus, the rural development policy constitutes an integrating framework for sustainable management of natural resources, which includes climate adaptation. It differs from the direct payments, however, in that it relies on voluntary instruments in the form of positive economic incentives that target groups may choose not to pursue.

In addition to these funding mechanisms targeting private actors, primarily, the instruments to promote climate adaptation in the agricultural sector include enhanced research and innovation and knowledge transfer and information actions (SWD (2013) 132 part 2). Furthermore, underpinning

these tools, an administrative tool in the form of a Staff Working Document guidance document should facilitate the integration of climate adaptation considerations into rural development programmes.

Overall, the agricultural policies thus contain a variety of instruments, representing different degrees of coercion, that may reinforce climate adaptation activities in relation to food production and to provision of ecosystem services.

The proposed agricultural legislation and related documents set out in general terms a demand for knowledge on climate change adaptation. Required knowledge includes monitoring of policy implementation and its impact, including indicators for climate action (Sec(2011) 625); information sharing among political-administrative units, horizontally and vertically, through guidance documents and adaptation strategies (SWD (2013)132); knowledge transfer to farmers through advisory services; and finally a need for research to ensure 'a climate smart agriculture' (SWD (2013) 132: 17).

3.3.4 Water

The Water Framework Directive (2000/60/EC) aims at the protection of water bodies within EU. As agricultural production affects both water quality and water quantity and the sector itself depends on adequate water supplies, there is considerable interplay between agricultural and water policies. An explicit reference to climate change adaptation is lacking in the policy document, but is implied in the articulation of its aim "[…] as well as contributes to mitigating the effects of floods and droughts." Furthermore, climate change adaptation is considered in the implementation of the WFD. Water note 10 on climate change, for example, mentions "In the years to come, climate change will increase the likeness of flooding, droughts and other consequences throughout the water cycle. The Water Framework Directive provides European countries with a common basis to address these problems". Thus, the aim of the WFD is consistent with adaptation objectives to ensure efficient water management and water quality through water management practices.

While agricultural policy is mentioned as relevant for climate adaptation in the 2009 Guidance Document on River Basin Management in a changing climate' (EC 2009), the role of agriculture in relation to climate adaptation and implementation of the Water Framework Directive is not in any way spelled out. In the section on adaptation measures, the document does, however, offer examples of different sectoral adaptation measures that may 'positively interact with the WFD environmental objectives' and it includes here improved water use and reducing fertilizer and pesticide use (EC 2009: 67). Moreover, soil management and its interplay with water management is highlighted as playing a key role an important role in climate adaptation (ibid: 19). As a framework directive, integrating other directives that impact on water quality and quantity, the WFD does very explicitly address the co-existence of multiple policy objectives. Moreover, the principle of integrated water management indicates that water policy objectives take priority. Thus to the extent that adaptation activities are essential for fulfilling the objectives of the water framework directive climate such adaptation activities should be prioritized; but it does not rule out conflicts with climate adaptation activities in other fields.

Being a framework directive, the WFD primarily addresses the policy making procedure and does not set out policy instruments directed at actors on the ground per se, other than those included in the directives that are cross-listed or incorporated into the framework directive. The main administrative tool in place to implement the WFD, then, is river basin management plans (RBMPs), which must be redeveloped every six years. The RBMPs outline the main problems facing water management as well as Programmes of Measures to tackle these problems. Thus, the RBMPs may serve as a mechanism to prepare and implement climate change adaptation measures (Water note

10), although climate adaptation has not been included in many RBMPs in the first round of RBMPs covering the years 2009-2015 (see for instance, Nielsen et al. 2013). The communication on drought and water scarcity sets out a programme of actions at EU level, which will be followed up by annual reports tracking the EU's progress in tackling this problem (Water note 10). Finally, the Commission has stated its commitment to introduce the Water Framework Directive as part of cross compliance obligations when all Member States have fully implemented the WFD, in particular with clear obligations for farmers (COM(2011) 625 final).

An integral part of WFD is the EU Nitrates Directive (91/676/EEC). This Directive aims to ensure that measures are taken to reduce and prevent nitrate loss to the water environment, with reference to agricultural sources. The Nitrates Directive provides a framework for action, describes the requirements for identifying and designating Nitrate Vulnerable Zones (NVZ), and lists the measures that should be included in action programmes (Barnes et al., 2007). Under the Article 3 of the Directive, all Member States are required to report to the European Commission on water quality monitoring result and the measures in the Action Programme every four years.The directive does not refer to climate adaptation, having been adopted in 1991 before climate adaptation came onto the policy agenda. However, climate change may impact on the implementation of the nitrate directive through reduced water levels in some areas, which in turn could increase the concentration of nitrates in water bodies. In other areas, an increase in precipitation and more frequent storms could increase nitrogen surface run-off; here the nitrate directive mandate of applying fertilizers according to codes of good agricultural practices becomes important. Thus, climate adaptation objectives appear to be consistent with the overall objectives of the nitrate directives of protecting water from diffuse pollution. Both directives are in line with the objective of ensuring sustainable use of natural resources.

In general, then, the EU water policy objectives are in alignment with climate adaptation policies of ensuring efficient water management and ensuring water quality through water management practices. Moreover, both water policies and climate adaptation objectives serve to ensure that agricultural production contribute to provision of ecosystem services. And the funding mechanisms of the CAP contribute to the potential integration of all of these objectives.

The need for knowledge on climate adaptation has been made explicit in recent implementation documents on the WFD (EC 2009), including also the annual reporting on community handling of drought and water problems.

3.3.5 Soil

In 2006, the Commission proposed a Soil Framework Directive, in response to the need "to tackle soil productivity, risks to human health and the environment, and to provide opportunities for climate mitigation and adaptation as well as stimulating business opportunities for soil remediation" (COM (2012) 46 final). As soil erosion and soil quality may be affected by climate change, climate adaptation is also a relevant objective for this policy area. Thus, climate adaptation objectives have been included in the proposed framework directive. The policy is consistent with the new Rural Development proposal, which includes the objectives of sustainable management of natural resources and climate mitigation and adaptation, including by means of improved soil management and enhanced carbon sequestration in agriculture and forestry (COM(2012) 46 final).

Otherwise, the directive does not directly address consistency with other policies, but the Soil Framework Directive, while not yet adopted, is also integrated in the CAP 2014-2020. If and once the directive is in force, Member States are expected to report on implementation of the directive.

As for instruments soil-related standards have been considered by including a new Good Agricultural and Environmental Condition (GAEC) on organic matter protection (COM(2012) 46 final). Moreover, the Rural Development Programme incorporates the objective of climate mitigation and adaptation, including by means of improved soil management and enhanced carbon sequestration in agriculture, will provide a funding vehicle for this purpose (COM(2012) 46 final).

3.3.6 Biodiversity

Although not directly linked to the traditional objectives of agriculture for food production, the past negative impacts of farming activities on nature and its current multifunctional role calls for the inclusion of biodiversity in this analysis. The Birds Directive (2009/147/EC) and the Habitats Directive (92/43/EEC) are key EU pieces of legislation regarding biodiversity. Although later policy documents list climate change as being among the key drivers of biodiversity loss (2020 Bioversity Strategy), neither one of these earlier directives makes explicit reference to climate change and therefore in terms of policy output do not fulfill the basic adaptation criterion of inclusion; nor do they consider consistency with adaptation criteria. As mentioned in section 3.2.4, however, climate change is considered in recent policies related to biodiversity and nature protection such as the 2020 Biodiversity Strategy. The Strategy also establishes also clear links to agriculture. Specifically, one of the aims of Target 3 of the strategy ("Increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity") is to maximize agricultural areas, including cultivated land, that are covered by biodiversity-related measures under the CAP. The purpose is to "to bring about a measurable improvement in the conservation status of species and habitats that depend on or are affected by agriculture and in the provision of ecosystem services as compared to the EU 2010 Baseline" and in the end to contribute to enhance sustainable management (COM(2011) 244 final).

Reduced negative impact of agriculture on biodiversity or even contribution to improved wildlife habitats and landscape connectivity are important ecosystem services that agriculture may provide. Thus, to the extent that agriculture contributes to renewed resilience of nature habitats and thus improved biodiversity, objectives of agricultural, biodiversity and climate adaptation policies may be consistent and in fact offer co-benefits. But as adaptation is not explicitly included in biodiversity policies, consistency and weighting are also not specifically considered.

To monitor implementation of the Habitats Directive, the Commission will periodically prepare a composite report based on the information sent to it by the MS regarding the application of national provisions adopted under this Directive (Articles 16, 17). Action 4 of the 2020 Biodiversity Strategy also aims to "improve and streamline monitoring and reporting" (e.g. development of EU bird reporting system, further development of the reporting system under Article 17 of the Habitats Directive, improvement of the flow, accessibility and relevance of Natura 2000 data.). While this does not yet include reporting on climate adaptation objectives, such regular reporting can easily be adjusted to include also climate adaptation criteria if policy objectives themselves are reformulated. In fact, the 2020 Biodiversity Strategy includes specific monitoring and reporting actions.

Analysis of the instruments embedded in the policies indicates both consistencies and potential conflicts with climate adaptation, particularly with regards to the ecosystem services provision of agriculture. The Birds Directive, for example, lists under the Article 3 some measures that have the potential to create co-benefits with climate adaptation, e.g. creation of protected areas, creation and/or re-establishment of destroyed biotopes etc. While these objectives are consistent with climate adaptation objectives of preventing biodiversity loss, the directive does not unequivocally prioritize protection of birds over agricultural production. Hence, according to Article 9 member states may derogate from the main protection stipulations of the directive 'where there is no other satisfactory solution for the following reasons [….] to prevent serious damage to crops, livestock, forests, fisheries and water".

According to the proposed regulations linked to the direct payment rules (COM (2011)625) and to rural development (COM (2011) 627), rural development funding is expected to contribute towards the completion of the implementation of both the Natura 2000 and to the achievement of the EU's 2020 Biodiversity Strategy. Within Target 3, for example, three actions are linked to agriculture: Action 8: “Enhance direct payments for environmental public goods in the EU CAP” (e.g. direct payments for delivering environmental public goods beyond cross-compliance e.g. permanent pasture, green cover, crop rotation, ecological set-aside, Natura 2000, improvement and simplification of GAEC cross-compliance standards, inclusion of the WFD within the scope of cross-compliance), Action 9: “Better target rural development to biodiversity conservation” (e.g. integrate biodiversity targets into rural development strategy, enhance collaboration among farmers for achieving landscape features that would improve or protect biodiversity) and Action 10: “Conserve Europe’s agricultural genetic diversity” (e.g. agri-environmental measures to support genetic diversity in agriculture).

As for knowledge needs, the Biodiversity Strategy (COM (2011) 244 final) explicitly includes requirement for monitoring and reporting and suggests that requirements to report on biodiversity into agricultural legislation, among others, would improve knowledge on the impacts of these policies on biodiversity. The strategy identifies research needs regarding the impact of climate change but knowledge needs regarding adaptation are not identified.

3.3.7 Cohesion policy

The Cohesion Policy for 2014-2020 remains at the proposal stage and its text has not yet been finalized (SWD (2013) 135 final). But the proposed regulation reflects increased attention to and prioritization of climate change adaptation, which in the context of risk management has been identified as one of eleven Thematic Objectives. The regulations explicitly mention climate change adaptation as part of the horizontal principle on sustainable development, and a 20% - overall EU budget spending on climate change has been proposed, which will include spending on adaptation.

The Cohesion Policy addresses the need for coordination of policy objectives; it stipulates that member states, regions and sectors will be required to analyze the risk that climate change will prevent fulfillment of program objectives as well as identify opportunities for direct funding for climate change adaptation activities such as infrastructure investments or even development of adaptation action plans. Moreover, the cohesion policy assigns significant weighting to climate adaptation objectives. National and/or regional risk assessments for disaster management are a precondition for funding.

These mainstreaming elements in the Cohesion Policy are strongly reinforced by the commission proposals to ensure coordination across EU structural funds, of which the cohesion fund is one, through a common set of rules. As the rural development fund is also included in this coordination effort, the potential for synergies between cohesion and agricultural policies is present and this may reinforce climate adaptation activities in the agricultural sectors, particularly in those countries that are primary recipients of cohesion policy funding. Integration of climate adaptation across these policies will be greatly reinforced by the reporting requirement implicit in the Partnership Agreements. These agreements lay out how member states will address horizontal principles, including climate adaptation, in the operational programmes related to the structural funds, and they must be submitted to the Commission as binding. For instance, the Cohesion Policy programmes must set out the indicative amount of support for climate change objectives.

Furthermore, in line with the common proposed for the structural and cohesion funds under the Common Strategic Framework, it is suggested that all the 'investments to be supported by ESI Funds should be resilient to the impact of climate change and natural disasters (increased risks of flooding, heat waves, extreme weather events, etc).

The Cohesion Policy is first and foremost a funding policy, hence its primary policy instrument is the Cohesion Fund, the purpose of which is to provide financial contributions to projects in the field of the environment and to trans-European networks in transport and infrastructure through investments. The fund primarily targets countries with less than 90 pct. of the EU27 average Gross National Income per inhabitant (2011/0274(COD). The prioritization of climate adaptation is reflected in the proposal for the coming period. Article 3 of the proposed regulation lays out investment priorities of the cohesion fund; some of these priorities offer co-benefits for climate adaptation activities in the agricultural sector. Thus, article 3 (b) explicitly lists promotion of climate change adaptation, risk prevention and management by supporting dedicated investment for adaptation, and 3c) lists protecting the environment and promoting resource efficiency by iii) protecting and restoring biodiversity, including through green infrastructures. The latter may therefore remedy some of the potential conflicts identified between agricultural adaptation and delivery of biodiversity.

As member states are required to report on the implementation of cross cutting policy objectives in the structural funds in the Partnership Agreement, the cohesion fund does set out a mechanism to ensure knowledge sharing on adaptation measures taken under these policies.

3.3.8 Discussion on integration of adaptation in agricultural policies

CPI as policy output

Sections 3.3.3 through 3.3.7 have outlined how climate adaptation has been integrated into agricultural policy, including policies directly related to agriculture and policies that delineate the ecosystem services that agriculture may provide or depend on. This has been analyzed with regards to the specific policy output, using the integration criteria laid out in section 3.1 (Table 3.11).

The analysis suggests that climate adaptation objectives have been included in the main pieces of legislation regulating agriculture, i.e. the Common Agricultural Policy and the proposed soil directive, while it is not explicitly mentioned in the directives that link more to the delivery of ecosystem services of agriculture, i.e. water and biodiversity directives. Yet, the analysis shows that the objectives of the latter policies appear to be consistent with climate adaptation objectives and therefore with the objectives of sustainable agricultural production and delivery of ecosystem services. Policies do not explicitly rank or weight some criteria above others, but there appears to be a shift towards the relative weight assigned to sustainability criteria, including climate adaptation, in the agricultural policies. Overall, this indicates that the EU adaptation strategy (COM (213) 216 final) and the white paper before it (COM 2009 147 final) have led to the inclusion of climate adaptation objectives into agricultural policies or that the development of these policies has been successfully coordinated in the policy making process.

This implies, however, that the greening of agricultural policies and the environmental objectives of these related policies mean that the agricultural sector has to attend to multiple goals, the priorities of which are not necessarily clearly specified. Even where potential co-benefits exist, the crowded policy agenda may result in a lack of attention to climate adaptation. In the absence of a clear and authoritative weighting among multiple objectives, the interests of actors as well as the strength of

the policy instruments gain importance in terms of determining which objectives will receive attention and the likelihood that climate adaptation will be prioritized.

Table 3.11 Summary based on sections 3.3.3 through 3.3.7 relative to integration criteria of Table 3.1.

Policies/ Directives	Criteria			
	Inclusion	Consistency	Weighting	Reporting
CAP	Inclusion in recently adopted proposals for CAP 2014-2020	Consistency is discussed as a general issue and 'balancing' is a stated objective	It does not assign specific weights to multiple policy objectives, but does increase weighting of green objectives. Applies also to funding, both single payment and rural development funds	Rural development policy requires evaluation re policy objective of climate action measures; MS' also to report on climate adaptation measures in Partnership Agreements.
Water policies (Water Framework Directive (WFD) and Nitrate directive	Indirect inclusion in WFD objective regarding mitigation of floods and drought. Not included in Nitrate Directive (older)	Consistency among policies related to water is addressed as a general issue; climate adaptation not specifically mentioned. Adaptation could be included in programmes to implement river basin management plans	Water policy objectives take priority; thus implicit weighting of water policies including those related to climate adaptation. WFD may be tied to cross compliance in agriculture. This could increase the weight assigned to climate adaptation as far is it relates to objectives of WFD	Annual reports tracking drought and water scarcity issues and action programmes at the EU level Programmes of measures to be submitted to the European Commission. Not yet explicit requirement regarding climate adaptation, but possibly in future reporting periods.
Soil strategy	In the proposed, but not adopted soil directive	Consistency with climate adaptation not explicitly addressed, but addressed through consistency with the rural development programme	No weighting	Once directive is in force, MS' are required to report on implemention. But not specifically on climate adaptation
Biodiversity policies	No inclusion in directives, but in the 2020 Strategy			
Cohesion Policy	Adaptation one of 11 thematic objectives in the proposed regulation	Explicitly addresses consistency among policy objectives. Common set of rules and objectives across EU structural funds promote consideration of consistency	Adaptation objectives are prioritized through disaster risk assessments as a precondition for funding	Through Partnership Agreements

Studies on implementation gaps of EU policies led to promotion of softer policy approaches such as procedural regulation, public participation and voluntary agreements to allow for flexibility at the national and local levels (Knill and Lenshow 2000), but recent studies indicate that at least for coordination across bureaucratic institutions with crowded policy agendas and competing objectives softer incentives such as information were much less effective than harder incentives, defined as precise, binding and enforceable rules, in getting sector bureaucrats to integrate cross cutting objectives such as environmental protection into their decisions (Pollack and Hafner-Burton 2010; see also Knill and Lenschow 2000). In this light the policy outputs developed here may be strong enough to ensure consideration of climate adaptation, particularly in the rural development fund.

But the policies will not necessarily ensure a prominent role for climate adaptation in governmental decisions. Given that climate adaptation has been specified to be a key strategic objective, but nevertheless only one among many, one would expect the immediacy of climate change problems to determine the priority assigned to climate adaptation. This may vary between European regions, where the negative aspects of climate change appear more immediate in Southern Europe. Furthermore, the issue is whether information and risk assessment tools are available. Here, the EU guidance documents and information sharing through portals offer some tools. Finally, the question is whether funding is sufficient. On the one hand, the coordination of structural funding around a few common themes, including climate adaptation, offers the promise of coherent and effective funding. Especially, the inclusion of climate adaptation objectives in the rural development fund and the cohesion fund appear to offer public agencies some important tools for implementing the adaptation strategy in the agricultural sector.

However, in agriculture much adaptation depends on private actors, namely farmers. Whether they undertake climate adaptation activities would depend on whether they expect to benefit directly and immediately (more or less) from climate adaptation activities. Unlike climate mitigation activities, it may actually be in the immediate interest of farmers to undertake adaptation, either to avoid damages or risks or to take advantage of potential gains. Thus, farmers may have an incentive to act, at least when it comes to the first objective of the agricultural policy – to ensure a viable food production. However, it is not clear that farmers are directly motivated to engage in climate adaptation for the protection of ecosystem services, unless they are given incentive to do so. This raises therefore the issue of the policy instruments in place. If farmers are motivated, the main challenges for climate adaptation concern capacity, i.e. information and funding. As for funding, the rural development programme offers funding mechanisms for farmers wishing to undertake climate adaptation activities. Information and awareness may also be established through Farm Advisory systems. These can help farmers building adaptive capacity by bringing them the necessary knowledge.

If farmers are not immediately motivated, the rural development programme may be less useful. This programme applies a voluntary approach, and previous experience shows that the programme is less attractive to farmers who see themselves first and foremost as producers (see for instance Pedersen et al. 2012). However, the greening of the direct payment and adding climate adaptation to cross compliance stipulation may prove a powerful tool to get these farmers to undertake climate adaptation.

The increasing focus on the multifunctional role of agriculture, reflected in the cross compliance requirements of the direct payment scheme and the integration of multiple objectives in the rural development programme, has put in place some elements of a system for knowledge production and reporting mechanisms, which appear to facilitate also the incorporation of knowledge on climate adaptation. Yet, it remains to be seen whether governmental and private actors are capable of handling the many objectives and reporting requirements in an integrated and balanced manner,

especially as the policies do not offer a clear prioritization among objectives. To this end, it might be useful to apply develop comprehensive decision support tools or to include stakeholders in decision processes as a way to ensure that multiple objectives are considered and traded off against each other in an integrated manner. Moreover, as a basis for future development and dissemination of knowledge, it is key to develop an understanding of how private actors and local governmental actors perceive changing weather patterns and changing conditions for agriculture and rural development, including their sense of urgency and responsibility for action. Such knowledge is essential for developing effective policies.

Adaptation as a process of governing

As the analysis of policy outputs shows, climate adaptation is being included in the reformed agricultural policies. But agricultural policies are to serve multiple functions and thus intersect with several other policy areas, posing a complex coordination task across and among multiple policy objectives. The question is whether tools are in place to coordinate across policy sectors and government departments. Applying the analytical framework by Schout and Jordan (2008), several mechanisms that would serve to integrate climate adaptation into the processes of governing in the agricultural sector can be identified in the agricultural policies, and more explicitly in supporting documents such as staff working documents.

As an example of a horizontal coordination instrument, the staff working document on integration of climate adaptation into the rural development programmes states that climate authorities and experts should be closely involved in the design and implementation of rural development programmes and measures (SWD (2013) 139). Likewise, each member state is supposed to set up national rural networks (NRNs) and climate experts are 'encouraged to engage with their NRN' as a way to encourage information sharing about how to include climate adaptation needs in the rural development programmes.

The policy proposals on the rural development programme specify several outputs and tasks that may serve to coordinate policy decision processes. Thus, the proposal (COM (2011) 627 final) lays out a requirement for a situation (SWOT) analysis to be carried out for the rural area programme and mandates that climate change adaptation is included in this analysis (article 9). The staff working document (SWD (2013) 139) characterizes this analysis as 'an important opportunity to embed adaptation considerations into the process.'. (p16). Another output that may to serve both across governance levels and across sectors is the Partnership Agreement that each member state must draw up, outlining its plans for implementation of the EU structural funds, including the rural development fund and the cohesion fund; part of the task is to outline how the implementation will achieve integrated territorial development and meet EU cross cutting objectives such as climate adaptation (SWD (2013) 139). Another specification of tasks is represented in the Cohesion Policy requirement that risk assessments on disaster management must be carried out as a precondition.

These coordination instruments may ensure that climate adaptation will be considered in agricultural policy making and implementation. But it is questionable whether they would ensure that climate adaptation is prioritized among many objectives, even when there are no outright contradictions. The coordination instruments embedded in the agricultural and related policies tend to be of the softer kind, although with the economic incentives embedded in the structural funds being perhaps more forceful. But as shown by Pollack and Hefner-Burton (2010) softer instruments have not been successful in getting sector DGs to seriously pay attention to cross-cutting issues such as environmental protection or gender policies in their decisions. Likewise, Knill and Lenschow (2000) have not found strong evidence that softer policies helped reduce the implementation gap of EU policies at the member state levels.

4 Discussion: Opportunities and stumbling blocks for the integration of adaptation at the EU level

In the light of the general analysis of the strategy itself and two areas that the strategy has identified as particularly important for adaptation it is now possible to return to the questions of integration of adaptation in EU policies and the question of knowledge use:

> How can integration be characterised and where are its strengths, weaknesses, opportunities and risk?
>
> What role does knowledge production and use play in the development of EU adaptation policy?

The approach to integration taken by the European Commission in the Adaptation Strategy can be seen as a logical consequence of the nature of adaptation to climate change. The complexity of adaptation issues in the two sectors that have been analysed suggests that the framework approach to integration is justified. A detailed strategy for "all" sectors and key activities would become bewildering, especially when the geographical diversity of Europe is taken into account. An attempt to include detailed specifications for sectors in the Strategy itself would also most likely have encountered opposition in the established policy areas. This is particularly true for agriculture, which has a long tradition of sector based policy making.

The chosen approach can also be seen as a general way to deal with the growing complexity of European politics and policy making. Deferring the details to sectors and keeping them out of the debate on the Strategy was probably a good approach for making the Strategy acceptable to Member States and sector interests. It can be argued that it reflects a careful consideration of the subsidiarity principle. There is, however, a risk that the approach leads to extensive planning and reporting, but little action. It is therefore crucial that the integration goes beyond mere verbal inclusion.

4.1 Rational adaptation

The Strategy itself and the current manifestations of integration of adaptation in the sectors underline strongly the rational justification of adaptation. The observable integration reflects past adaptation policies and the preparation of the Strategy rather than a specific output of the 2013 Strategy. However, neither the Strategy nor its impact assessment (SWD(2013) 132 final) suggest a clear break with the past with respect to the basic interpretation of what integrating adaptation means at the policy level. For example, the impact assessment provides a rational argument "Besides the direct benefits that further integration of climate change adaptation will create when EU legislations are being revised, listing priority initiatives for further mainstreaming would *raise awareness of the need to integrate* climate change considerations in key EU policy areas." (SWD(2013) 132 final, p. 42, emphasis added). This also suggests that adaptation is an additional objective that needs to be recognised, but not one that needs to be given priority over other sector specific objectives. Both coastal policies and agricultural policies display this rational view of adaptation.

The strength of this approach depends on the strength of evidence that the impacts of climate change need to be taken seriously. For many sectors the projections compiled by the EEA (2012) and the IPCC (AR5) provide evidence of possible future impacts, despite considerable uncertainties. The time frame is, however, an issue. If impacts are expected to become significant only towards the mid-century, sectors such as health or security that mainly operate with a much shorter time horizon, may not take adaptation seriously, even though some aspects, such as the overall design of the support system, would benefit from long term planning of adaptation. For coastal policies, for

which long term infrastructures are a key concern, the rational arguments are quite strong and can already be seen in specific policies (Section 3.2). In agriculture policies, rational arguments for adaptation are also put forward with some weight, since challenges related to climate change are already emerging in the form of less predictable precipitation patterns, particularly water shortage in some regions of Europe. Even where agricultural policies address the potential delivery of agriculture to ecosystem services, policy documents apply a rational argumentation, highlighting the dependence of agriculture on well-functioning ecosystems.

The lack of wider sustainability considerations is a potential weakness of an approach that primarily appeals to the rationality of sectors. EEA (2013) notes that "A key challenge for EU adaptation policy is to ensure policy coherence across its many sectoral policies, integrating Europe's efforts to create a sustainable, resource-efficient, green, low-carbon, and climate-resilient economy." For example, the CLIMWATADAPT-project (ref.) has noted that crosschecks should be made to assure that mainstreaming in one policy does not transfer the vulnerability of one sector or area to other sectors or areas. There is thus a demand for policies that are capable of integrating several sectors. For coastal areas the proposed Framework Directive on Maritime Spatial Planning and Integrated Coastal Management (COM(2013) 133 final) could provide such an integrating tool that covers many sectors. At the Member State level the Strategic Environmental Assessment Directive (2001/42/EC) may also provide a way to integrate and balance sector interests. One should, however, note that these policy instruments also rely on general planning and rational argumentation, not normative regulation. There is thus a great demand for convincing analyses and demonstrations of how potentially conflicting interests related to adaptation can be managed. The CSF funds, including the rural development funds and the cohesions funds, also represent an integrated approach, as member states in their implementation must take into account a list of cross cutting objectives, including sustainable management of land.

4.2 Governance

In the light of the Strategy the governance of integrating adaptation into sectors is at the EU level foremost a process. The Strategy can be seen to strengthen the position of DG-Clima in consultations within the Commission so that issues of adaptation are easier to bring into different substance areas. This is clearly a strength, but the findings of this study also point out some potentially weak areas in the governance that can weaken the effectiveness of the strategy unless they are addressed.

For the Strategy to be effective at the EU level it is crucial that it provides a basis for input early in the policy process. This can be seen in the need to steer, for example, the policy development that ensures mainstreaming of climate change into CSF-Funds 2014-2020 (Tender CLIMA.C.3/SER/2012/0011). Success at this stage is important for achieving greater normative strength within the sector policies, leading to inclusion in specific directives or their implementation. It is, however, worth noting that in some cases successful integration can be achieved at the level of implementation even without fundamentally changing the underlying instruments. This is the case with instruments that are sufficiently generic to allow for new aspects such as climate change vulnerability or adaptive capacity to be included. Examples where this has already occurred include the Water Framework Directive and the Habitats Directive (see Sections 3.2.4 and 3.2.5). The step to new active measures may nevertheless require additional tools such as funding through the CSF-funds, Life+ or infrastructure investments, as indicated by the Strategy. For these new policy developments early intervention in the policy process is critical as, for example, funding priorities and criteria will strongly guide how the instruments can be used to achieve actual progress in concrete adaptation action.

The vertical policy integration from the EU level all the way to the local level is obviously crucial for a policy area such as adaptation. It cannot be based on a detailed top-down regulation as adaptation requires sensitivity to local contexts. Therefore vertical integration involves a process of successive interpretations that bring the general principles and objectives of the EU-level to the country level and eventually to local implementation. In rural and cohesion policies as well as specific instruments such as Life+ a generic framework exists for these processes. The processes include dialogues between the Member States and the Commission and between the Member State and its regional and local actors. They are expected to lead to focused and well-adjusted actions. However, it is well known that such interpretative processes can be problematic. A critical feature is that the broad strategies and visions at the top may create expectations that cannot be fulfilled at the local level, where everyday problems set in (Pressman and Wildavsky, 1984). Parts of EU's funding system may exacerbate these problems, if local actors are encouraged to make and are rewarded for proposals that seemingly fulfil strategic goals without having the full capacity to reach them.

The underlying logic of the governance of integration is strongly institutional and partly cognitive. Coordination is emphasised and there are elements in place that support it. At the EU-level these, include the demand for impact assessment of Commission initiatives. The impact assessments provide in principle opportunities for reflection on what adaptation means and is in agreement with involvement at early stages in the policy process. The impact assessments are, however, the responsibility of the responsible DG and the writing of the reports is often partly outsourced to external consultants. This may be a weakness in those DGs that have not traditionally paid much attention to climate change. The success of the chosen institutional logic therefore partly depends on the success of a cognitive logic that contributes to learning (Nilsson and Persson 2008). Recommendations for (mandatory) risk assessments as suggested by, for example, for the CAP and Rural Development funding[16]may be a way out of the chicken-and-egg dilemma. A risk assessment may function as an eye-opener that then leads to greater awareness of the issue.

Participatory policy making may be way to increase awareness of sectors by bringing in new information, knowledge and perspectives. At the EU level consultations are organised, but they tend to remain at a general policy level as shown by the consultation of the Adaptation Strategy, which focused on policy and politics of the strategy (DG Clima, 2012). The concrete action tends to take place in the sectors. To avoid too restricted outputs there is a need for integrated approaches that can encourage also stakeholders to bridge the concerns of several sectors.

4.3 Processes for policy Integration

In terms of the Schout and Jordan (2008) (see Section 3.1) typology the EU's adaptation strategy can be seen is a mission statement which sets the tone for the EU's approach to adaptation. While this is important, in itself it is insufficient as adaptation can all too easily get crowded out (Dery 1999) by the strong policy agendas that dominate current EU policy making (e.g. policies to facilitate a quick economic recover following the 2008 credit crunch, sovereign debt and Euro crisis). To become effective the strategy needs to be supported by a mix of approaches (e.g. horizontal instruments, mission statements, etc – see Section 3.1) that can place adaptation high on the EU policy agenda and promote a coherent EU approach. Several policies (see Sections 3.2. and 3.3) include elements that could be developed further. The EU's climate adaptation strategy does, however, introduce rather little new in the way of mechanisms and procedures to promote a more integrated approach to adaptation. Instead it is largely dependent on the willingness of individual sectors to proceed. This approach may mainstream adaptation within policies, but the ad hoc basis

[16] CLIMWATADAPT www.climwatadapt.eu [Visited November 1 2013]

that this entails includes the risk of stumbling on conflicting policy objectives and missing opportunities for synergies in developing EU policies.

The EU does have a system of ex ante impact assessment - a specified output associated with a standard operating procedure (see Section 3.1) to help policy makers synthesize, generate and share knowledge on potential impacts as they develop policy. Moreover, it has identified knowledge gaps (for example as illustrated in the coastal policy case) that need plugging to enact successful adaptation strategies. As illustrated in Section 3.1 such management of knowledge is crucial for coherent integration. Yet the ability of the impact assessment procedure and other forms of knowledge generation to support the Adaptation Strategy might be constrained for at least two reasons. First, adaption is only one impact that a policy maker has consider when developing policy out of 35 listed in the EU's Impact Assessment Guidance (SEC(2009)92). This reflects a general problem of the integrated EU impact system that its ambition to do justice to the broad concept of sustainable development is a challenge. It often leads to long assessment reports, where it may be difficult to identify the key points. For example, the impact assessment document of the Adaptation Strategy is nearly 200 pages long (including annexes) and the corresponding document of the proposed framework Directive for Maritime Spatial Planning and Integrated Coastal Management is nearly 120 pages long. Thus, there is a risk that key information will not be picked up by sectoral actors in their policy making activities. Second, the impact of knowledge on policy is complex, recursive and often messy (e.g. see Owens, 2012; Juntti et al 2009).

Institutional politics, pressure from competing stakeholders, a lack of capacity to interpret and handle information, not least in the face of information overload and crowded agendas, can all lead to the politicisation of knowledge and uses of knowledge that do not correspond to a linear flow from producers of knowledge to policy makers informing policy, as suggested by the technical-rational model of knowledge use (Owens et al 2004). The knowledge that the impact assessments provide can be deployed cognitively so that it cumulatively enhances understanding of the issues at hand, without clearly leading to some specific choice. But it may also be used symbolically, considered as a gesture but in a superficial manner that does not affect policy output, or it may even be used exclusively as political ammunition (Weiss 1979, Owens 2012).

Crucially the knowledge use patterns such as those described above are arguably more at risk of occurring if there are not suitable processes and mechanisms in place to steer the integration processes and to systemise the role of knowledge in adaptation planning. Thus it is important that the Commission further develops its array of cross-sector and within sector mechanisms to better support the knowledge management process. This includes further refinement of the interagency consultations not only in the initial stages of the policy development but also in support of the implementation. With such developments EU can strengthen its ability to promote a consistent approach to climate adaptation across its policy making and avoid policy conflicts.

4.4 Outputs and outcomes

The reviewed policies and associated instruments show a wide range of different outputs that can be identified and monitored in order to verify progress in output related to the integration of climate change adaptation. Some of the output, such as general strategy documents, may only reflect a superficial awareness of the topic. Other output, such as specific criteria for the allocation of funding, is likely to suggest stronger commitment and a potential for real change. Documenting and measuring outcomes is more difficult. A proper evaluation would need adequate counterfactuals (EC, under revision) and these are difficult to determine as several non-climate related processes also affect what ultimately counts as adaptive capacity. As an alternative, Dupuis and Biesbroek, (2013), have argued that the evaluation of outcomes of adaptation policies should use the similarity to an ideal model of successful adaptation policy as a reference. Such an ideal adaptation policy

should be at least enabling, coherent and processually successful (Dupuis and Biesbroek, 2013). These criteria can be seen to correspond to the analysis of governance and processes. This study has shown, that the specific context of the relevant policies needs to be taken into account in defining the ideal.

Outcomes in terms of adaptive capacity cannot yet be attributed to the EU strategy, although they could be considered to be the result of conscious efforts at mainstreaming adaptation since the Green Paper of 2007. However, for several key areas, including agricultural policy, the policy reform cycle is such that adaptation is only now being included into policy proposals which will take effect from 2014. Hence, measuring adaptive capacity as an outcome of the EU adaptation strategy, even considering the 2007 Green Paper, would be premature.

Monitoring and evaluation are essential to ensure effective implementation of the EU strategy. DG Clima has committed itself to an overall monitoring of the Strategy: “The Commission will develop indicators to help evaluate adaptation efforts and vulnerabilities across the EU, using LIFE funding and other sources. In 2017 the Commission will report to the European Parliament and the Council on the state of implementation of the Strategy and propose its review if needed.”

The sector analysis (Chapter 3) shows that there are several monitoring mechanisms in place that can be adjusted to provide essential information on adaptation to climate change and that others can be developed even when the underlying instruments lack a recognition of climate change. These monitoring mechanisms serve the monitoring of sector policies at the Member State level. A weakness is that they do not provide information on how the different DGs promote adaptation. For those DGs which have already included adaptation issues to become part of their normal activities this may not be a serious drawback. Information on adaptation and adaptive capacity will probably be gathered and analysed also from the point of view of the contribution of the EU policies in question. For DGs which see adaptation as a marginal topic relative to their main concerns, the potentially available information on adaptation may never get properly synthetized. Thus the feedback loop to the Commission’s own activities may remain incomplete and corrective action will have to wait for a new strategy, which is not optimal.

5 Key messages

BASE objective 1 calls for an analysis of adaptation measures and their significance in order to examine implications for policy making, taking into account the most significant and likely impacts. This study has shown that one also needs to examine and understand the relevant policies in order to make correct inferences from information on cases. Thus coherent integration of adaptation climate change into agricultural policies is supported by the strength of the CAP. Coastal management lacks a single dominant policy that could ensure coherent adaptation. In coastal areas several strong policies and interests clash, raising strong demands on the processes. The proposed framework directive on marine spatial planning and integrated coastal management may support greater consistency and systematic weighting, but one should be aware that as an instrument its emphasis is on reporting and the knowledge base. It can support but not dictate integration.

BASE objective 3 calls for an identification of conflicts and synergies of adaptation policies at different levels of policy making with other policies (including climate mitigation) within and between sectors. This analysis of EU level policies have shown that in two sectors identified by the Adaptation Strategy as particularly important a “rational inclusion” of climate change adaptation has not encountered major conflicts. This may change somewhat at the level of weighting and the specification of concrete targets, where additional issues related to the sustainability of alternative solutions may be raised. The implications are that sector and policy specific governance of the integration is essential.

The strength of the EU Strategy lies in its effort to mainstream adaptation into all relevant policy areas. Its predecessors have contributed to a general awareness and the strategy is expected to contribute further to this process. Currently the focus is on early policy stages. The power of the EU Adaptation Strategy to steer policy processes is limited by its framework character and its focus on the early (agenda setting) stages. Policies are being formulated throughout the policy cycle, especially as they are implemented on the ground. It is vital that the Strategy bites at this stage in order to be successful. This can be achieved by strengthening coordination and/or by further strengthening uptake of the mainstreaming and climate proofing in the sectors.

Some sectors and policies have been forerunners in developing tools and processes that help to recognise presumed effects on the adaptive capacity in the policies. These are essential for ensuring consistency and coherence in policies, and they required systematic knowledge production. The strategy places great hope on the Climate-ADAPT portal, but additional tools for knowledge production and knowledge use are likely to be needed at the EU-policy level. A portal is not a sufficient condition for mainstreaming of climate change at the EU level, where, as this analysis has demonstrated, sectors are affected by a great number of partly interlocking policies that view adaptation from quite different angles.

Commitments to maximise synergies and minimise contradictions between adaptation objectives and sectoral objectives are important. Especially in policies based on economic incentives explicit weighing of objectives and allocation of resources for adaptation may help to identify novel ways of integrating adaptation into sector activities. In other cases the Strategy can function like glue between or a catalyst across sectors. Developing the active exchange of experiences is essential.

Knowledge production in the form of reporting is likely to be sufficient for identifying outputs in the examined sectors. For determining changes in adaptive capacity more sophisticated analyses are required. These cannot be achieved through routine reporting, but required dedicated analyses within and across sectors also at the level of EU policies.

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Appendix: list of acronyms

Acronym or abbreviation	Name
CAP	Common Agricultural Policy
CFP	Common Fisheries Policy
EU SDS	EU Sustainable Development Strategy
IED	EU Industrial Emissions Directive (2010/75/EU)
ICZM	Integrated Coastal Zone Management
MSFD	EU Marine Strategy Framework Directive (2008/56/EC)
MSP	Marine Spatial Planning
RBD	River Basin District based on the WFD
RDI	Research, Development and Innovation
RES	EU Directive on the promotion of electricity produced from renewable energy (2001/77/EC)
TEN-T	Trans-European transport network
WFD	Water Framework Directive