



# RESPONSES project

**European responses to climate change: deep emissions reductions  
and mainstreaming of mitigation and adaptation**

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## Catalogue of programmes and policies related to regional development and infrastructure ('Baseline assessment')

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# 1 Introduction

*„Under changing climate conditions, it is likely that risks of infrastructure failure will increase worldwide as weather patterns shift and extreme weather conditions become more variable and regionally more intense.“ (Auld & MacIver 2007)*

Infrastructure is commonly referred to as “*the physical facilities that support our society*”. Broadly speaking, infrastructure projects can be said to fall into five different categories (cf. box 1).

Infrastructure and climate change are interrelated in several ways. On the one hand, infrastructure can be the cause for green house gas emissions and thus a driver of climate change; on the other hand it is vulnerable to the impacts of climate change, especially extreme weather events. Most of our current infrastructure was built without climate change in mind, neither aiming at reducing emissions nor considering the unavoidable consequences of climate change that we will face over the next decades.

Infrastructure in five categories ( based on Holper et al., 2006; Wilbanks et al., 2007)::

- buildings and settlements: commercial, municipal and residential building stock and associated landscape infrastructure;
- transport: roads, tunnels, bridges, rail, airports, ports;
- water: water storage, water supply, sewerage, irrigation, drainage;
- power: electricity generation, electricity transmission, oil and gas production, gas transmission and distribution, and liquid fuels; and
- communications: fixed-line communications, mobile communications, transmission towers.

Infrastructure investments are typically long-term investments (40+ years). Decisions about major structures are taken at different jurisdictional levels, mostly the national and regional. The European Union (EU) has different ways to influence the construction and construction-related standards of infrastructure, for instance by introducing new legislation in its domains of competence, but also through its Investment Banks, and, most substantially, through the Structural Funds. This financial instrument of EU Regional Policy, which makes up the largest part of the EU budget, serves to support small-, medium- and large scale infrastructure projects in little developed and structurally disadvantaged regions of the EU.

The aim of work package 6 (WP6) of the RESPONSES project is to assess the mitigative and adaptive capacity of the Structural Funds and other relevant/related policies and to produce policy options that will enhance these capacities. The baseline assessment reported here will provide a starting point for further analysis. This report will provide an overview of the history, design and recent discussions in EU regional policy; a first assessment of the extent to which climate change is already integrated into this policy domain; and literature reviews on relevant topics such as greening of the Structural Funds and the mitigative and adaptive capacity of EU Cohesion Policy. This report also seeks to identify research and knowledge gaps as well as to generate other important indications for the research in WP6.

A baseline assessment, an impact and vulnerability assessment of EU investments in infrastructure and a mitigation potential analysis shall help to generate policy options, which will be appraised in the subsequent phase of the project. In this report we set the stage for the further tasks:

- Chapter 2 identifies critical questions and resulting implications concerning the assessment of impacts and vulnerability of infrastructure and infrastructure investments in the EU.

- Chapter 3 describes EU Cohesion Policy, its historical evolution as well as the ongoing discussion about its future, which is the general background for the generation of future policy options.
  - Chapter 4 goes into detail about the current design of the Structural Funds – the main instrument of EU Cohesion Policy. The multi-level and cross-sectoral character of the policy is on the one hand promising for the mainstreaming of climate change considerations; On the other hand it indicates difficulties for deep qualitative and quantitative assessment as administrative structures are adapted differently in each Member State and project outcomes on the regional and local levels are difficult to grasp.
  - Chapter 5 is dedicated to the issue of environmental and climate change mainstreaming from an EU perspective, giving an overview of processes, instruments and outcomes of policy integration on the macro-, meso- and micro-level.
  - Chapter 6 presents the first bit of empirical research for this work package, an exploratory analysis of evidence for climate policy integration, based on Member States' programming documents for cohesion policy, the National Strategic Reference Frameworks (NSRFs).
  - Finally, Chapter 7 addresses the main research and knowledge gaps identified in chapters 2 to 6, that will be addressed in subsequent research within this work package.
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## 2 Vulnerability of infrastructure to climate change impacts

### 2.1 Introduction

While climate change is expected to pose increasing risks from weather extremes, policies are being developed to deal with these anticipated risks. Assessments of current and expected future weather risks form an important basis for such policy. Such assessments inform the planning of measures, cost estimates of anticipated measures and benefits of risk reduction, as well as the communication of potential risks to a variety of stakeholders.

The general elements that are considered in impact assessments (IA) are the exposure of a system to weather hazards (including climate change) and the sensitivity of a system to such hazards (see Fig. 2.1). Usually, vulnerability analysis (VA) includes the potential impacts and additionally the adaptive capacity, i.e. the capacity of a system to cope with or minimise the impacts (see Fig. 2.1). This involves a quantitative or qualitative assessment within a defined time-frame of interest (Füssel, 2007), usually comparing potential future risks to a baseline of current risks. Fundamentally, the two concepts of impact assessment and vulnerability analysis are inter-related and cannot be segregated (more details can be found in the RESPONSES research protocol).

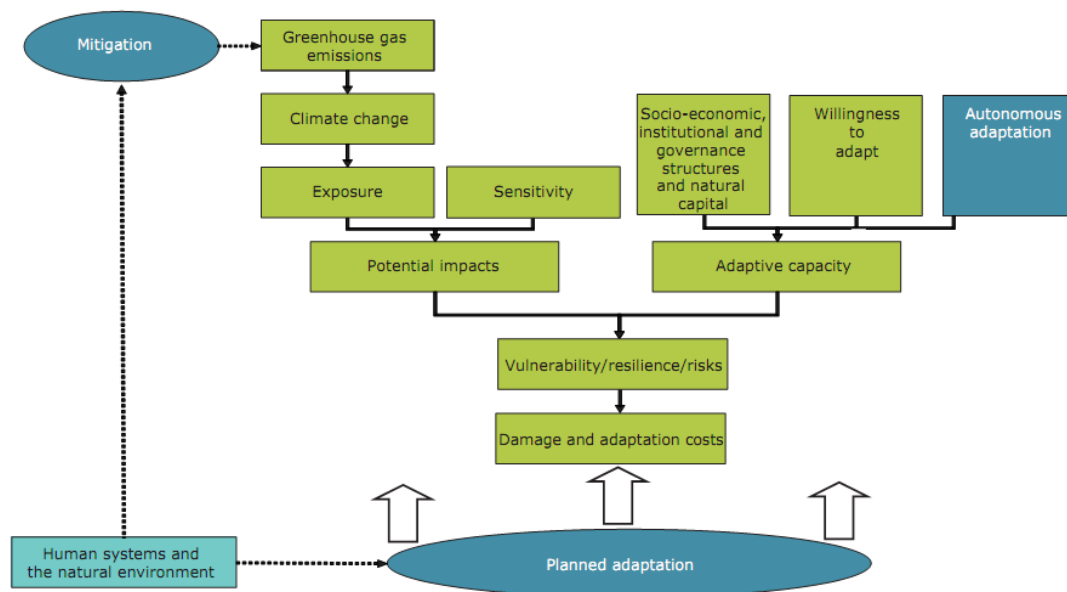


Figure 2.1 Concept of vulnerability, impacts and adaptation (taken from EEA, 2010, p. 30).

There is a long history of studies aiming at quantifying the effects of natural hazards on population groups or regions at various spatial scales, taking into account the social, economic and/or political forces (Eriksen & Kelly, 2007). Recently, there is an increasing demand by decision-makers for quantitative measures that allow for comparisons of levels of vulnerability across countries and regions. In particular, as decision makers now begin to mainstream climate change into new and existing programs and policies, they are in need of rapid assessments of impacts, adaptive capacity and vulnerability options (Rosenzweig & Wilbanks, 2010). In this context, so-

called vulnerability indicators based on spatially explicit analyses play an important role, e.g. for comparing relative vulnerability in order to benchmark country or region performance (Cutter, 2003) or for evaluating priorities for intervention and funding (e.g. Klein, 2003).

A series of studies has assessed the current risks of weather hazards on the European economy. For example, EEA (2010) reports that over the period 1980-2009 all natural disasters (including non-weather) in Europe caused more than 100.000 deaths and 414 billion Euros in direct economic damages. Changes in climate could potentially increase these costs, as indicated by EEA (2010). According to that report, the water, energy, building and transport infrastructure in urban areas are particularly vulnerable to weather extremes.

Apart from anthropogenic climate change, two other important drivers determine changes in the occurrence of damages to the built environment and infrastructure. First, natural climate variability, at timescales of decades, can also lead to periods of increased impacts. Second, increasing exposure is a major driver of past and future losses (see e.g. Bouwer et al., 2007). Therefore it is essential to estimate the factors contributing to increased exposure, primarily population growth and economic development. These processes are commonly addressed by incorporating them in scenarios, in a similar manner as for changes in climate/weather risks. A series of studies has done this, for instance for coastal flooding and erosion (Dawson et al., 2009), river flood risks (Feyen et al., 2009; Maaskant et al., 2009; Bouwer et al., 2010), and for storm risks (Dorland et al. 1999; Schmidt et al., 2009). Usually, these studies are carried out at the national scale, rarely for Europe as a whole (for exceptions see Nicholls & Klein, 2005; Ciscar, 2009; Feyen et al., 2009).

The aim of this chapter is to lay out an approach for the analysis on potential impacts on infrastructure in the European Union, one of the key objectives of RESPONSES WP6. The rest of this Chapter is structured as follows: Section 2.2 will address the state of the art, and the scope of the work on impacts and vulnerability for WP6; and Section 2.3 will address the development of climate change vulnerability indicators, as envisaged for the RESPONSES project.

### 2.2 State of the art and scope of analysis in WP6

In calculating the potential impacts and costs of climate change, a number of methodological issues need to be addressed. Items to be considered include, amongst others (EEA, 2007):

- Treatment of scenarios;
- Valuation of market and non-market effects, and indirect effects;
- Approaches for spatial and temporal variations (discounting and distributional effects);
- Type of climate hazard and impact categories covered by the analysis.

At the most general level, the assessment of economic impacts of climate change can involve five basic steps, as indicated in the diagram below (Figure 2.2). While other FP7 projects conduct a detailed monetary valuation, within RESPONSES the focus will be on steps 1-4.

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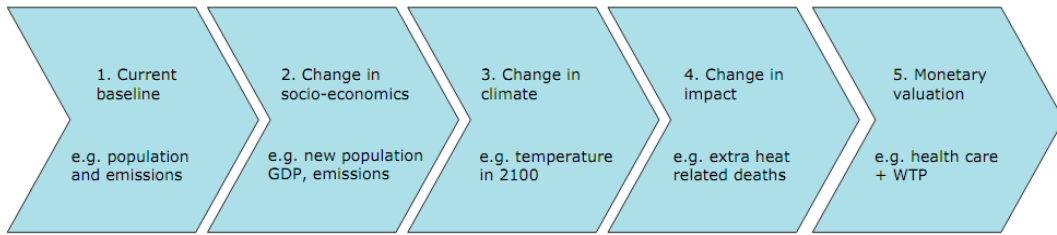


Figure 2.2 Steps in the assessment of costs of climate change impacts (excluding the potential effects in vulnerability from mitigation and adaptation) (taken from EEA, 2007, p. 22).

Moving from impact assessment broadly to infrastructure more specifically, one way to systematically identify potential impacts on infrastructure is the development of an exposure and sensitivity matrix. This has been done for the State of Victoria in Australia (see Figure 2.3), possibly one of the most comprehensive analyses in this area to date. The items of negligible risks and definite risks are determined by a series of extensive analysis for each type of infrastructure. These can involve detailed modelling, using impact models and scenarios, complemented by expert knowledge and interviews.

Infrastructure Type	Climate Change Impacts											
	Increased Solar Radiation	Decrease in Available Moisture	Increased Variation in Wet/Dry Spells	Increased Temperature & Heatwaves	Decrease in Rainfall	Increase in Extreme Daily Rainfall	Increase in Frequency and Intensity of Storms	Increase in Intensity of Extreme Wind	Increased Electrical Storm Activity	Increase in Bush Fires	Sea-Level Rise	Humidity
Water												
Sewer												
Stormwater												
Electricity												
Gas and Oil												
Fixed Line Telecom Network												
Mobile Network												
Roads												
Rail												
Bridges												
Tunnels												
Airports												
Ports												
Buildings and Structures												
Urban Facilities												

Table Legend

	Negligible Risk – Presents “negligible” risk within the probability of natural variation
	Definite Risk – Presents “definite” risk within the probability of natural variation

Figure 2.3 Infrastructure exposure and sensitivity matrix (taken from Holper et al., 2006).

Most studies that are available on infrastructure impacts are usually limited to single weather hazards, and single types of infrastructure. For instance, most studies tend to focus on infrastructure risks that are related to flooding for several countries, but other weather hazards are less covered (see EEA, 2010, p. 43). More comprehensive impact studies for infrastructure in large urban areas have been done for many cities

around the world, including London, New York, Mexico city and many others (for an overview see Wilbanks et al., 2007).

While many studies have assessed the physical impacts of climate change on the built environment and infrastructure assets in Europe, the following aspects define the niche and added value of the RESPONSES project in addressing this sector:

- EU wide assessment: the current study will provide an assessment of infrastructure vulnerability for all 27 EU member states, at a sub-national and local level (in this case NUTS 2 level)<sup>1</sup> to the extent possible.
- The study will follow a comprehensive approach, by addressing multiple extreme weather types, including:
  - Temperature extremes;
  - Precipitation changes;
  - River floods;
  - Forest fires.
- It will address multiple types of infrastructure and products/services in an EU-wide assessment. These types can include water supply, transport, and power and communication networks, depending on the information available (no information is available for instance for sanitation and drainage at the European scale).
- It will develop vulnerability indicators due to current weather/climate as well as potential future vulnerability based on climate scenarios, in order to highlight potential hotspots of change in the EU.
- A robust and transparent indicator structure quantifying climate change vulnerability by contrasting climate impact indicators with adaptive capacity indicators.
- Actual climate change adaptation investments of the European Union within the framework of the Structural Funds, even though still limited (see other chapters in this report), are incorporated into adaptive capacity indicators in order to assess their impact.

### 2.3 Concepts of quantifying climate change vulnerability by means of indicators

Generally, an indicator is defined as “a quantitative or a qualitative measure derived from a series of observed facts that can reveal relative positions in a given area. When evaluated at regular intervals, an indicator can point out the direction of change across different units and through time.” (OECD, 2008) Indicators should be relatively simple functions with a linear behaviour (i.e. monotonously increasing or decreasing) (Hinkel, in print). Several forms of indicators can be distinguished:

- a. scalar indicators
- b. aggregate indicators
- c. composite indicators
- d. vector indicators

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<sup>1</sup> The NUTS (*nomenclature d'unités territoriales statistiques*) classification is geocode standard for dividing up the territory of the EU for the purpose of harmonizing EU regional statistics and framing EU regional policies.

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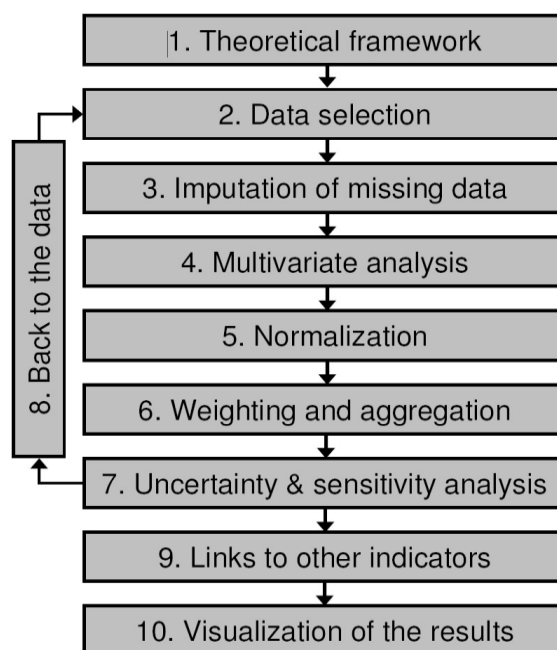


Figure 2.4 Steps for constructing a composite indicator (From OECD, 2008).

While (a) scalar indicators simply refer to one theoretical variable, (b) aggregate indicators combine a number of variables in the same unit (e.g. GDP as the total economic value of multiple goods and services within a region or state). In contrast, (c) composite indicators combine several observable variables measured in different unit into a common unit (AEA, 2009). (d) Vector-valued indicators are usually presented as wind rose or spider diagrams with multiple axes starting from the central point, such as the Livelihood Vulnerability Index (Hahn, 2009). Moreover, Hinkel (in print) distinguishes between indicators that evaluate the current state of an entity (which he calls “harm indicators”) and indicators with a forward looking aspect that map possible future harm. The latter type is usually based on outcomes of predictive computer simulation models. When constructing indicators, the major challenge is to simplify and convey the complex reality of vulnerability in the form of a clearly and easily understandable metric that reflects the essential components and relationships within a system (Barnett et al., 2008). In this context, several guidelines and frameworks for developing indicators have been proposed (e.g. the eight step approach by Schröter et al., 2005b; or the ten step approach by OECD, 2008, see Figure 2.4).

Within the European Commission, indicators are widely applied to support but also evaluate policy making at various geographical (from regional to EU wide) and policy levels (from individual policies to interrelated policy-packages) and their use is likely to further increase in the future (White & Zwirner, 2007). However, in the context of vulnerability to climate change only a limited number of vulnerability indicators have been developed so far (e.g. Brooks et al., 2005; Schröter et al., 2005a; Tol & Yohe, 2007). To the authors no example is known where climate change vulnerability indicators are used to inform sensitive political issues such as funding allocations. However, a comprehensive compilation of existing information on vulnerability indices (including data availability) concludes that there is substantial potential for vulnerability indicators to contribute to EU funding allocation decisions (AEA, 2009). At the same time, there is currently an intense scientific debate related to the relevance, legitimacy and credibility of climate change vulnerability indicators. While vulnerability as such is an appealing concept for decision makers, in particular indices of countries’

generic vulnerability to climate change have been criticized to suffer from conceptual, methodological and/or empirical flaws (e.g. Barnett et al., 2008; Füssel, in print). Eventually, most of the weaknesses of existing indicators can be linked to one or more of the following major challenges:

- a. the definition of vulnerability.
- b. the context-specific nature of vulnerability.
- c. the concept of adaptive capacity.

Regarding the first point, the term 'vulnerability' has been used for many decades by various academic communities and has led a wealth of different perceptions and definitions associated with a similar diversity of assessment methods. This has caused considerable confusion especially in the climate change context and several attempts have been made to provide generic terminological frameworks (e.g. Füssel, 2007). However, Hinkel (in press) concludes that none of them (including the IPCC definition, IPCC, 2007) offers sufficient guidance to make the concept of vulnerability operational for indicator development. Instead, quantitative indices should be developed bottom-up based on a clearly defined purpose and audience, and on the data available.

The second pitfall relates to the fact that vulnerability usually is not a generic condition, but context-specific and unevenly distributed in space and time (Barnett et al., 2008; Eriksen & Kelly, 2007). This poses a major challenge for defining the vulnerable entity (for example, do we measure specific types of urban infrastructure or do we assess built-up areas in general, or an aggregation of selected types?) and for selecting the climate related hazards to be considered. A framework for rigorously defining the vulnerable entity/entities and the hazard to which it is vulnerable has been developed by Ionescu et al. (2009). Generally, many authors argue for the development of sector- or hazard-specific indicators instead of solely employing generic vulnerability indices (e.g. Eriksen & Kelly, 2007; Tol & Yohe, 2007). Closely linked to the selection of variables is the contentious process of weighting and aggregating them, which inevitably incorporates a subjective value judgment (Barnett et al. 2008; Nardo et al., 2005). Stakeholder involvement to reach consensus about the index construction and the meaning of the terms used (Klein, 2009) as well as presenting vulnerability as a series of maps (Schröter et al., 2005) have been suggested to improve this drawback.

Most crucial for the development of vulnerability indicators is probably the third challenge, which is concept of adaptive capacity of a system, i.e. the ability to cope with weather hazards due to climate change. There is considerable debate about its fundamental determinants and several 'lists' have been proposed (e.g. Yohe & Tol, 2002). Most widely applied are economic measures, such as the Gross Domestic Product (GDP), while a number of studies have stressed the importance of the social component (e.g. Barnett et al., 2008; Pelling & High, 2005) which has often been neglected or underrepresented. Other authors argue that peoples' perception of climate risks determines the type of response and the efficiency of adaptation rather than the formal presence of a 'high' adaptive capacity (e.g. Bazerman, 2006). Methods suggested to increase transparency and credibility in this regard include the use of a combination of generic measures and sector specific factors (AEA, 2009) and/or the application of a set of evaluation criteria to assess their consistency at a regional scale (Moser et al., 2008).

To conclude, the quantification of climate change vulnerability by means of indicators is currently in high demand from the policy side. However, the construction of indices, in particular composite indicators aggregating disparate (geo-spatial) datasets and variables, poses some crucial challenges that have to be considered carefully. For the

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further work within the RESPONSES project on quantitative impact assessment and vulnerability analysis this implies an emphasis on developing hazard-specific indicators (e.g. floods, forest fires, extreme temperature events, droughts, etc.). By combining the hazard-specific indicators a generic “index of climate change vulnerability on infrastructure and regional development investments” can then be generated as supplementary information. Ideally, the entire index construction process should involve a dialogue with policy makers at DG Regio and/or other EU institutions in order to achieve agreement about the selection of parameters as well as their weighting, and thus to increase the credibility and legitimacy of the outcomes.

After this brief overview of the links between climate change impacts, vulnerability and infrastructure, as well as the WP6 research agenda in this regard, in the following chapter we will move more to the ‘policy side’ of our analysis, namely the workings and challenges inherent in EU Cohesion policy, as a major funding source for infrastructure investments across the EU.

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## 3 EU Cohesion Policy

Cohesion Policy is a particular form of regional policy. We understand regional policy in general as any intervention of a government or in our case the EU at sub-national level to address economic, social, ecological and planning issues integral to the positive development of a normative, homogenous and/or functional entity. In the Treaty of Maastricht 1992 *cohesion* was coined as a term applying to the comprehensive form of regional policy that is practiced in the EU. It aims at economic, social and territorial cohesion, seeking to reduce regional disparities across Europe. Cohesion Policy is administered by DG Regio of the European Commission. This chapter briefly overviews history and future of EU Cohesion Policy to provide a background for the following analyses.

### 3.1 Historic evolution and objectives

Cohesion – economic, social territorial – is a core aim of the EU. The constituting treaty of the European Community provides that regional disparities shall be reduced in order to achieve economic and social cohesion and refers to the Structural Funds as one of the supporting instruments (Lisbon Treaty Articles 158,159).

Initially, the Treaties of Rome in the early 1950s included no provisions for an explicit common regional policy. Activities in that field remained the competency of the Member States. The European Social Fund (ESF) and the European Investment Bank (EIB) were founded in 1958, the European Agricultural Guidance and Guarantee Fund (EAGGF) in 1962. In the 1960s, the regional disparities not only across Europe, but also within countries, increasingly became the subject of conferences and expert reports. The resulting idea of a European Regional Policy was then raised in 1965 in a first Communication of the European Commission containing a regional-political vision. Three years later, the Commission’s Directorate-General for Regional Policy, in short DG REGIO, was established.

The need for a common regional policy became more pronounced in the light of the first enlargement of the Community in the early 1970s. In 1973, the Thompson report concluded that as the European Community was expanding, this was happening in a less harmonious and balanced way than had been hoped for. As a consequence, in 1975, the European Regional Development Fund (ERDF) was introduced for a trial period of three years with the objectives of correcting regional imbalances due to the predominance of the agricultural sector, industrial change and structural unemployment in many European regions (DG REGIO 2008). The purpose of the ERDF and the other existing funds (i.e. ESF and EAGGF) was to co-finance projects which had been selected beforehand by Member States.

In spite of these early developments, the ground for Cohesion Policy as we know it today was laid only in the 1980s. The incorporation of the Structural Funds into the Single European Act of 1986, and thus into the revised Treaties of Rome, contractually assigned regional policy to the European Communities<sup>2</sup>:

*“In order to promote its overall harmonious development, the community shall develop and pursue its actions leading to the strengthening of its social and economic cohesion.*

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<sup>2</sup> Environmental and research policy were also among the newly assigned competencies of the EC.

*In particular the Community shall aim at reducing disparities between the various regions and the backwardness of the least favoured regions. [...] The Community shall support the achievement of these objectives by the action it takes through the structural funds...* (EEC Articles 130a-130b, Single European Act).

A year later, the Commission proposed to reform the Community's financial system in a document that became known as the Delors-I package. The reform programme was adopted by the Council in March 1989. It included a concentration of funds for poor areas, a transition to programming-based implementation (as opposed to the previous project-by-project financing approach), and the doubling of financial resources for the Structural Funds by 1992 (Tiefenbacher 2009).

The Treaty of Maastricht (aka Treaty of the European Union, TEU) 1992 endorsed cohesion as a core aim for the EU, next to the Economic and Monetary Union and the Single Market. The Treaty also laid the provisions for the Cohesion Fund and committed the Union to the principle of subsidiarity. The Committee of the Regions was established to give a voice to regional and local governments on the EU policy agenda. The adoption of the Treaty was followed by another reform package for EU regional policy – Delors-II. For the funding period 1994-1999, 168 billion ECU, i.e. 1/3 of the total EU budget, were allocated to the Structural Funds. The Structural Funds were on their way to become the single biggest cost item in the EU budget.

At the Berlin European Council in March 1999, the heads of government or state agreed on Agenda 2000. This action programme intended to strengthen EU policies and provided an outline for a financial framework for the period 2000-2006 in light of the 2004 enlargement round. In the first programming period of the new millennium, greater thematic and geographic concentration of projects rendered the Structural Funds more effective and improved management. The Phare programme (Poland and Hungary: Assistance for Restructuring their Economies)<sup>3</sup> was complemented by the Instrument for Structural Policies for Pre-Accession (ISPA) and the Special Accession Programme for Agriculture and Rural Development (SPARD) (Council Regulation (EC) no 1260/1999).

The Solidarity Fund was introduced in 2002 in response to the 100-year floods across Europe earlier in the same year. The respective regulation links the Fund directly to EU Cohesion Policy, but its primary purpose is to provide assistance in the case of natural disasters (cf. chapter 4.3).

The 2004 enlargement widened EU internal disparities and shifted them and thus the funding priorities of EU regional policy to the East. The various existing instruments for pre-accession (Phare, Phare, CBC, ISPA, SAPARD, CARDS, etc.) were replaced by one single Instrument for Pre-Accession (IPA).

The relaunch of the Lisbon Strategy in 2005 (Communication of the Commission to the European Council "Working together for growth and jobs. A new start for the Lisbon Strategy) had a strong impact on the upcoming programming period 2007-2013. In order to emphasise and strengthen the aims of the Strategy, the Commission earmarked 70% of the Structural Funds for key investments linked to the Lisbon Agenda. In the same year, the programming logic of the Structural Funds took on a more strategic dimension: The Commission sets out strategic guidelines (Community Strategic Guidelines), based on which Member States are in a next step to develop

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<sup>3</sup> The Phare programme was created in 1989, particularly for Hungary and Poland, but later extended to cover all accession countries of 2004 and 2007. It assisted the countries in their accession preparations, by supporting institution building, the adoption of the *acquis communautaire* and promoting social and economic cohesion.

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National Strategic Reference Frameworks (NSRF). The NSRFs lay out a development strategy for the country and propose a set of Operational Programmes (OP) for implementation, to be approved by the Commission. Finally, a Managing Authority at the national or regional level approves projects in line with the priorities in the OP.

The Lisbon Treaty, which entered into force in 2009, explicitly spelt out that EU Cohesion Policy was to further not only social and economic, but also territorial cohesion, a term which remains yet to be defined.

In summary, the Structural Funds are one of the biggest financial instruments of the European Union and Cohesion Policy is a core European task. Since the 1980s it has been subject to constant reforms and adjustments, but it has also been exposed to substantial criticism over the years. After this brief description of its historical evolution, the following section will briefly trace the current debates on the reform of Cohesion Policy and the Structural Funds.

### 3.2 The future of Cohesion Policy

The current debate on the future of EU Cohesion Policy in some way started with the 2003 Sapir report. Following an invitation of Commission President Romano Prodi in 2002, a high-level group of independent experts chaired by André Sapir provided recommendations for the European growth agenda. The resulting Sapir Report, entitled “An agenda for a growing Europe”, suggested a far-reaching restructuring of the EU budget including the Structural Funds and started debate on the renationalisation of Cohesion Policy, stating that “...several arguments, such as subsidiarity, coherence with national macroeconomic policy, equal treatment of equally prosperous countries, militate in favour of a country focus for the EU convergence policy. There is a solid argument for the new EU convergence policy to focus on countries, rather than on regions,...” (Sapir et al. 2003).

The official dialogue on the policy’s future was initiated by DG Regio in 2007, when it launched a consultation on the Fourth Report on Economic and Social Cohesion<sup>4</sup>. Those stakeholders that replied were mostly closely involved with Cohesion Policy. Based on their feedback, renationalisation of the policy was not a favoured perspective, yet many demanded a simplification of bureaucratic processes related to the management of the funds. Furthermore, especially local and regional stakeholders argued in favour of further decentralisation. Stakeholders also supported the idea of using the funds to pursue environmental issues and mitigate climate change.

In 2008, DG Regio published a first prospective analysis of the challenges facing EU regions in the near future. The report titled “European regions 2020” or short “Regions 2020”, identified a set of four core challenges: (1) demographic change; (2) globalisation; (3) climate change; and (4) energy security.

In 2009, two further important meetings on future Cohesion Policy took place when the Czech presidency of the EU organised a conference on the future of Cohesion Policy and territorial cohesion as well as an informal meeting of European ministers in charge of regional development. On this occasion, Danuta Hübner, then Commissioner for Regional Policy presented a Reflection Paper on the future of Cohesion Policy and announced the establishment of a High Level Group (HLG) to think further about this subject. The HLG met five times before summer 2010 in order to discuss core policy aspects and needs: e.g. the alignment with EU 2020, how to better focus on results

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<sup>4</sup> The consultation also contributed to the 2008/2009 EU budget review.

and ways to strengthen the strategic dimension of the European Territorial Cooperation objective, etc.

In 2009, the Barca Report, prepared by Fabrizio Barca at the request of Commissioner Hübner was published. The report was entitled “An agenda for a reformed Cohesion Policy – A place-based approach to meeting European Union challenges and expectations”. The Barca report’s notion of a place-based approach builds on the current structures of Cohesion Policy (empowering regional and local levels), but nonetheless stipulates major reforms; e.g. a focus on a few core priorities (e.g. climate change and innovation) and new contractual and reporting mechanisms.

In an orientation paper published on the website of DG Regio, former Regional Policy Commissioner Paweł Samecki presented some concrete proposals for the improvement of future Cohesion Policy based on the ideas by Barca. He suggests to increase the coherence in the delivery of strategic priorities by substituting the Community Strategic Guidelines and the NSRFs with one Single Strategic Framework and to better align funding instruments (e.g. integrate ERDF and Cohesion Fund). He further considers a simpler and more efficient management and control system as key to the improvement of Cohesion Policy (e.g. harmonising eligibility rules, reviewing verification and co-financing rules, more involvement of the private sector, etc.)

In conclusion, the ongoing discussions about EU Cohesion Policy do not allow for concrete predictions about their design for the next funding period from 2014 to 2020. Most recent discussions on re-nationalisation focused on the ESF, though no official comments were voiced from the Commission’s side (Euractive 2010) Based on what we know, it is likely that the regional focus and general structures of the funds will be maintained. However, attempts will certainly be made to improve both efficiency and effectiveness of programming and funding processes. It is also likely that environmental and climate change issues will be given a higher priority, expecting that the new EU strategy EU 2020 (CEC 2010) will play an equally or even more important role as its predecessor, the Lisbon Strategy.

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## 4 The Structural Funds

EU Cohesion Policy manifests itself in its main instrument – the Structural Funds. Currently, the Structural Funds consist of three funding tools, the European Fund for Regional Development (ERDF), the European Social Fund (ESF) and the Cohesion Fund, the latter is sometimes used separately, it is then pronounced as the Structural and Cohesion Funds, which is still based on the former composition of the Funds. The Structural Funds are currently organised through several Council regulations and one implementing regulation of the Commission.

### 4.1 Design

The Structural Funds consist of the Cohesion Fund, the European Regional Development Fund (ERDF) and the European Social Fund (ESF). All three Funds finance projects under different objectives.

For the programming period 2007-2013, substantial changes were made in the design of the Funds. In the light of the Lisbon Agenda, Convergence (objective 1), Regional competitiveness and employment (objective 2) and European territorial cooperation (objective 3) became the new headline objectives for Cohesion Policy (see Figure 4.1); the Community Initiatives were disintegrated, henceforth operating LEADER+ and rural development within the European Agricultural Fund for Rural Development (EAFRD), URBAN II and EQUAL under objective 2. Finally INTERREG III turned into objective 3, making cross-border cooperation a core priority of Cohesion Policy.<sup>5</sup>

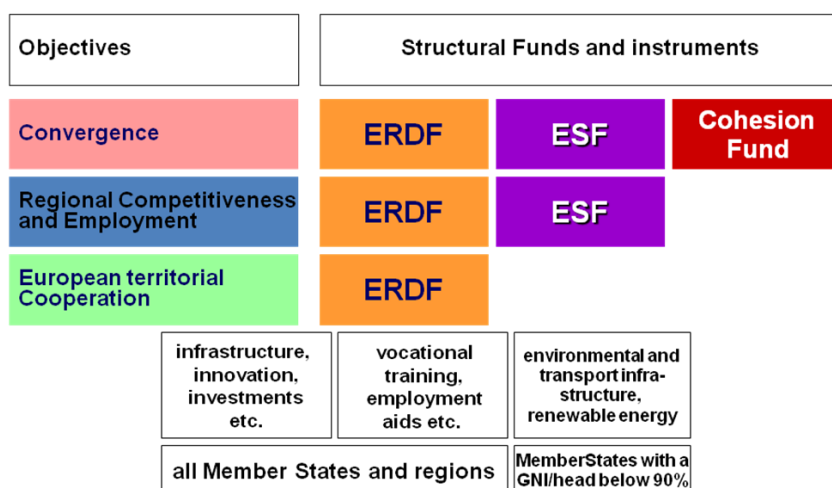


Figure 4.1 Structural Funds and the three overall objectives for 2007-2013 ([http://ec.europa.eu/regional\\_policy/policy/object/index\\_en.htm](http://ec.europa.eu/regional_policy/policy/object/index_en.htm)).

<sup>5</sup> Community initiatives were first mentioned in the Council Regulation (EEC) No 4253/88 of 19 December 1988 Article 11 "(...) the Commission may, on its own initiative (...) decide to propose to the Member States that they submit applications for assistance in respect of measures of significant interest to the Community not covered by the plans referred to in Title II." Besides INTERREG community initiatives for cross-border and transnational cooperation, there is URBAN (to act on the high concentration of social, environmental and economic problems in urban areas), LEADER (for bottom-up development initiatives in rural areas) and EQUAL (supporting activities against any kind of discrimination). The Community Initiatives are more autonomously managed by the Commission than standard regional policies (PERKMANN 1998; 659).

**Convergence** is the most important objective of Cohesion Policy. About 81 per cent of the total budget goes to this first objective, which is “*aimed at speeding up the convergence of the least-developed Member States and regions by improving conditions for growth and employment...*” (Council Regulation (EC) 1083/2006). Money for this objective is supplied by all Structural Funds. Regions with a GDP per capita of less than 75 per cent of the EU average are eligible for convergence support, whereas regions with a Gross National Income (GNI) per capita of below 90 per cent of the EU average additionally qualify for financing from the Cohesion Fund (for details on eligibility see EC 1083/2006, Chapter 3).

*Table 4.1 Objectives and measures of the Convergence objective. Bullet points that are relevant to the environment and climate change are highlighted in green.*

Convergence					
Objectives			Measures		
ERDF	Cohesion Fund	ESF	ERDF	Cohesion Fund	ESF
<ul style="list-style-type: none"> <li>▪ Supporting sustainable integrated economic development</li> <li>▪ Creation of sustainable jobs</li> </ul>	<ul style="list-style-type: none"> <li>▪ Financing of environmental measures</li> <li>▪ Financing of TEN-T</li> </ul>	<ul style="list-style-type: none"> <li>▪ Prevent and combat unemployment</li> <li>▪ Develop human resources</li> <li>▪ Foster social integration in the labour market</li> <li>▪ Promote a high level of employment</li> <li>▪ Promote equal opportunities for men and women</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Investments in:</b> <ul style="list-style-type: none"> <li>▪ R&amp;D, innovation and entrepreneurship</li> <li>▪ Information society</li> <li>▪ Environment</li> <li>▪ Risk prevention</li> <li>▪ Tourism</li> <li>▪ Culture</li> <li>▪ Transport</li> <li>▪ Energy</li> <li>▪ Education</li> <li>▪ Health and social infrastructure</li> <li>▪ Direct assistance for SMEs</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Environment projects on:</b> <ul style="list-style-type: none"> <li>▪ Drinking-water supply</li> <li>▪ Treatment of wastewater</li> <li>▪ Disposal of solid waste</li> <li>▪ Reforestation and erosion control</li> <li>▪ Nature conservation measures</li> </ul> </li> <li>▪ <b>Transport Infrastructure projects</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Vocational training, education &amp; counselling</li> <li>▪ Research &amp; innovation</li> <li>▪ Promotion of a skilled, well-trained &amp; flexible work force</li> <li>▪ Innovative &amp; adaptable forms of work organisation and entrepreneurship</li> <li>▪ Support career prospects &amp; access to new job opportunities for women</li> </ul>

**Regional Competitiveness and Employment**, the second objective, applies to all regions which do not qualify for the convergence objective. About 16 per cent of structural funding coming from the ERDF and ESF support this objective, which “*aims at strengthening regions’ competitiveness and attractiveness as well as employment by anticipating economic and social changes...*” (EC 1083/2006)

Table 4.2 Objectives and measures of the Regional competitiveness and employment objective. Bullet points that are relevant to the environment and climate change are highlighted in green.

Regional competitiveness and employment			
Objectives		Measures	
ERDF	ESF	ERDF	ESF
<ul style="list-style-type: none"> <li>▪ innovation and the knowledge economy</li> <li>▪ environment and risk prevention</li> <li>▪ access to transport &amp; telecommunication services of general economic interest</li> </ul>	<ul style="list-style-type: none"> <li>▪ prevent and combat unemployment</li> <li>▪ develop human resources</li> <li>▪ foster social integration in the labour market</li> <li>▪ promote a high level of employment</li> <li>▪ promote equal opportunities for men and women</li> </ul>	<p><b>Investments in:</b></p> <ul style="list-style-type: none"> <li>▪ improvement of regional R&amp;TD &amp; innovation capacities</li> <li>▪ entrepreneurship &amp; creation of new financial instruments for businesses</li> <li>▪ environment and risk prevention</li> <li>▪ access to transport &amp; telecommunications</li> <li>▪ Services of general economic interest</li> </ul>	<ul style="list-style-type: none"> <li>▪ increasing adaptability among workers and businesses</li> <li>▪ greater investment in human resources</li> <li>▪ making qualifications and skills more accessible</li> <li>▪ fostering enterprise and innovation</li> <li>▪ anticipating and manage economic change</li> </ul>

**European Territorial Cooperation**, the third objective, previously the Community Initiative INTERREG, is given greater visibility in the 2007-2013 programming period. About three per cent of structural funding, coming only from the ERDF, falls under this objective and goes to border regions at the internal and external borders of the EU.

Table 4.3 Objectives and measures of the European territorial cooperation objective. Bullet points that are relevant to the environment and climate change are highlighted in green.

European territorial cooperation	
Objectives	Measures
ERDF	ERDF
<ul style="list-style-type: none"> <li>▪ development of cross-border economic, social and environmental activities</li> <li>▪ establishing &amp; developing transnational cooperation (priorities: innovation, environment, better accessibility and sustainable urban development)</li> <li>▪ reinforcing effectiveness of regional policy</li> </ul>	<p><b>Investments in:</b></p> <ul style="list-style-type: none"> <li>▪ joint strategies for sustainable territorial development</li> <li>▪ encouraging entrepreneurship, protection and management of natural and cultural resources</li> <li>▪ development of collaboration, capacities and the joint use of infrastructures</li> <li>▪ bilateral cooperation between maritime regions</li> <li>▪ take steps to encourage regional and local authorities to form networks and exchange experiences</li> </ul>

## 4.2 Principles

The Structural Funds operate according to several principles of assistance (EC 1083/2006, Chapter 4), which are closely interrelated and which as a whole define action under EU Cohesion Policy. In the following, in line with the overall focus of this

report, those principles are listed which are of relevance for the mainstreaming of environmental and climate change objectives into Cohesion Policy.<sup>6</sup>

### *Complementarity, consistency, coordination and compliance*

To start with, there is the principle of **complementarity**: “The Funds shall provide assistance which complements national actions, including actions at the regional and local levels, integrating into them the priorities of the Community.” The second part of the citation indicates that the Structural Funds may have the potential to mainstream objectives and priorities formulated at the EU level to lower levels of governance. Secondly, the principle of **consistency**: “The Commission and the Member States shall ensure that assistance from the Funds is consistent with the activities, policies and priorities of the Community and complementary to other financial instruments of the Community.” This implies that cross-sectoral effects and potential spill-overs need to be considered. Both principles, complementarity and consistency, are used to justify earmarking of a certain percentage of the funding. 60 per cent of the convergence budget and 75 per cent of the regional competitiveness and employment budget are specifically dedicated to target the European Union priorities growth and competitiveness.

In the same vein, one third (i.e. 100 billion Euros) of the Structural Funds are earmarked for environmental objectives (CEC 2007). This includes “*direct infrastructure investments related to water and waste treatment, renewal of contaminated sites, pollution reduction, and support for nature protection and risk prevention. ... indirect investments with an environmental impact on areas such as transport and energy systems, eco-innovation, environmental management for businesses, urban and rural regeneration, and eco-tourism. For example, over €7 billion is earmarked to support energy efficiency and renewable energies.*” (CEC s.a.). Most of these investments come out of the Cohesion Fund and overlap with the allocations for growth and competitiveness.

The third principle guiding the operation of the structural fund is **coordination**, which refers to the need to coordinate the assistance of different funds, EIB interventions and other financial instruments according to the different competencies of the Community and the Member States. Finally, the principle of **compliance** addresses all other provisions of the Treaty, which have to be considered in the allocation of the Funds.

### *Multi-annual programming*

One of the improvements of EU Regional Policy in the beginning of the 1990s along with an increased overall budget was the introduction of multi-annual programming of funds. One key aim of this new approach was to secure predictable financing for long-term development projects. The three main stages of multi-annual programming are (1) the identification of priorities (i.e. setting up the Community Strategic Guidelines, (2) financing (i.e. setting up planning documents and allocations, selection of projects) and (3) management and control (i.e. evaluation and monitoring).

A strategic dimension was added to this in 2006 with the introduction of Community Strategic Guidelines, which were also meant to strengthen the principle of consistency introduced above. These guidelines are the strategic orientation point for the first programming stage (identification of priorities). They guide the development of the NSRFs, in which Member States specify their national priorities for the allocation of the

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<sup>6</sup> The principles not covered in this section are Territorial level of intervention, Proportional intervention, Shared management, and Equality.

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Structural Funds based on priority themes. The NSRFs need to be approved by the European Commission. The NSRFs are broken down into Operational Programmes (OP), which are, depending on the country, either primarily sectorally or regionally oriented. Based on the OPs, the responsible authorities (i.e. representatives of appointed ministries or in some cases regional governments) in dialogue with the Commission make the financial allocations of the Structural Funds. Considerable criticism has been voiced concerning this process, as the negotiations on these allocations provide much room for lobbying.

Finally, regarding the third programming stage, under the Convergence objective each OP has to undergo an ex-ante evaluation, while under the Regional competitiveness and employment objective the regulation (EC 1083/2006) are more flexible and the ex-ante evaluation can be carried out either covering all OPs or each Fund or each priority or each OP. Monitoring evaluations of the OPs are also required throughout the programming period. The Commission provides indicative guidance documents on different evaluation methods on the DG Regio Website. However, evaluations vary significantly throughout the Member States.

### *Partnership*

The partnership principle refers to the shared responsibilities between the Commission and the Member States and emphasises the need to involve competent regional, local, urban and other public authorities, economic and social partners; and appropriate bodies representing environmental partners and NGOs in the processes relating to Cohesion Policy. The partnership principle extends to all stages of the policy process: preparation, implementation, monitoring and evaluation.

### *Additionality*

The principle of additionality (“*Contributions from the Structural Funds shall not replace public or equivalent structural expenditure by a Member State.*”) forces the Member States to keep up their own level of structural investments, by linking it to the amount of Structural Funds that can be received. All projects financed by any of the Structural Funds require co-financing from the respective public authorities in the Member States. Earmarking of structural funding allocations imply that national expenditures are to some extent also tied to these objectives.

### *Sustainable development*

The explicit endorsement of the principle of sustainable development (“*...the objectives of the Funds shall be pursued in the framework of sustainable development*”) in the context of Cohesion Policy was an important step to provide more visibility for the issue. However, more concrete instruments and mechanisms will be necessary to anchor sustainability in all Structural Funds projects.

In a nutshell, the principles introduced above hint that there is significant potential in Cohesion Policy for environmental and climate mainstreaming. The principles of partnership asks for the involvement of different jurisdictional or planning levels as well as interest groups and civil society in all programming stages, which is an important premise for realising mainstreaming objectives in general and adaptation objectives in particular. Additionality enhances the complementary and consistency principles and thus mainstreaming capacities. The principle of multi-annual programming is particularly important for sustainable and environmentally relevant, and thus mitigation and adaptation, projects.

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### 4.3 Other cohesion programmes

Next to the three objectives, Convergence, regional competitiveness and employment and territorial cooperation there are several other programmes, which are part of Cohesion Policy and financed by the ERDF. We mention these only in order to provide a complete overview of the basic structures and potential of Cohesion Policy and to highlight that these smaller instruments should not be overlooked when it comes to greening and climate-proofing efforts in Cohesion Policy. They will not be part of the further analysis conducted in WP6.

#### *European Solidarity Fund (EUSF)*

The EUSF (Regulation (EC) No 2012/2002) was introduced in 2002 as an immediate response to the disastrous floods that affected France, Germany, Austria and the Czech Republic in that same year. The Community thereby made use of the flexible general provisions of the Structural Funds and allocated one billion Euros for rapid, efficient and flexible help in urgent situations. According to the EUSF regulation, Member States are eligible for help if losses of over three billion Euros or 0.6 per cent of the GNI occur, in exceptional cases of extraordinary regional disasters help may be granted even if those thresholds are not met. EUSF is in place to cover especially non-insurable losses (public infrastructure that by law cannot be insured, e.g. roads). Support from the Fund may be used to cover public expenses allocated to restoring public infrastructure, providing services for relief and clean up and protecting cultural heritage (EC 2012/2002, Article 3). Up until now, the allocations from the EUSF have addressed mostly flood disasters, followed by forest fires, storm events and earthquakes (CEC 2009 report on EUSF).

Hochrainer et al. (2010) were the first to examine the performance of the EUSF. The authors arrived at a rather negative result concerning legitimacy, viability and efficiency of the fund. They find that Eastern European countries have received less funding as a percentage of eligible losses than Western European countries and that they had to wait significantly longer for the assistance to be granted. Additionally, based on Hochrainer et al.'s analysis, Western Member States (the case examined here was Austria) may have received assistance for disasters with which they could have easily coped themselves. These findings indicate some friction between the current functioning of the EUSF and the aims of the Cohesion Funds, namely to assist in cases where national and regional means do not suffice. In addition, in terms of viability, Hochrainer et al., basing their analysis on modelled future flood disaster losses, warn that the funds might not be sufficiently capitalised. They also question its efficiency as "free" post-disaster assistance may encourage risky behaviour like building in high risk areas and many damages funded are indeed insurable. Overall, they end with suggestions for a far-reaching reform of the EUSF, including the proposal to turn it into a pre-disaster solidarity instrument, which supports national and regional insurance systems. If this line was followed, the EUSF could become a rather crucial instrument for supporting adaptation activities in Member States.

#### *Instrument for pre-accession assistance (IPA)*

The IPA provides support for countries which during the programming period 2007-2013 are in the accession phase to EU membership. The instrument aims to strengthen institutional capacity, cross-border cooperation, economic, social and rural development. "Pre-accession assistance supports the stabilisation and association

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process of candidate countries<sup>7</sup> and potential candidate<sup>8</sup> countries while respecting their specific features and the processes in which they are engaged.” (Council Regulation (EC) 1085/2006).

The IPA is made up of five components, each covering priorities defined according to the needs of the beneficiary countries. Two components concern all beneficiary countries:

- the “**support for transition and institution-building**” component, aimed at financing capacity-building and institution-building;
- the “**cross-border cooperation**” component, aimed at supporting the beneficiary countries in the area of cross-border cooperation between themselves and the EU Member States.

The other three components are aimed at candidate countries only:

- the “**regional development**” component, aimed at supporting the countries' preparations for the implementation of the Community's Cohesion Policy (ERDF and CF).
- the “**human resources development**” component, which concerns preparation for participation in the European Social Fund in particular;
- the “**rural development**” component, which concerns preparation for the common agricultural policy and related policies.

Environmental and climate change concerns are not explicitly integrated in the regulations for the IPA.

#### *Financial Engineering (JASPERS, JEREMIE, JESSICA, JASMINE)*

A considerable amount of the Structural Funds budget goes to the supporting businesses; however, instead of achieving self-supported development too often the financial support resulted in an over-reliance on the funds (CEC 2010). Five financial engineering programmes have thus been set out to improve access to finance (e.g. loans and venture capitals) and to provide more indirect assistance (e.g. advice and guidance and support for networking and clustering). They are currently being implemented in cooperation with the European Investment Bank and other International Financial Institutions.

- JASPERS (Joint Assistance in Supporting Projects in European Regions) supports the New Member States (accession in 2004 and after) in preparation of their largest Structural Funds Projects. It aids the efficient and effective implementation of projects.
- JEREMIE (Joint European Resources for Micro to medium Enterprises) is available for SME (Small and Medium Enterprises), particularly for start-ups and micro-enterprises in all European regions. “Evaluations and studies demonstrate a clear correlation between, on the one hand, access to finance and risk capital for small

<sup>7</sup> According to DG enlargement candidate countries are countries which fulfill a set of criteria including stable institutions guaranteeing democracy, a functioning market economy and the ability to assume the obligations of membership (the Copenhagen Criteria) and apply formally for EU membership. Croatia, Turkey and the former Yugoslav Republic of Macedonia became candidate countries in 2005, the first two also started accession negotiations then (<http://ec.europa.eu/enlargement/>, last accessed on 17.12.2010).

<sup>8</sup> Potential candidate countries are other countries of the Western Balkans that have been promised the prospect of EU membership as and when they are ready (<http://ec.europa.eu/enlargement/>, last accessed on 17.12.2010).

and medium enterprises and, on the other hand, economic growth and competitiveness.”

- JESSICA (Joint European Support for Sustainable Investment in City Areas) supports managing authorities of Structural Funds programmes and offers outside expertise and better access to loan capital for promoting urban development. Participants contribute programme resources; in turn the EIB, private banks and investors contribute additional loan or equity capital as appropriate, thus increasing the sustainability of the investment effort.
- JASMINE: Joint Action to Support Micro-finance Institutions in Europe.

These programmes have no environmental component so far, but could contribute considerably to mainstreaming efforts.

#### 4.4 Climate change in EU Cohesion Policy

EU Cohesion Policy is essentially a development policy, implemented through one broad instrument, the Structural Funds. The budget of the Funds is allocated according to a strategic, multi-level and multi-annual programming cycle, based on NUTS III regions. The Structural Funds are designed to stimulate implementation of EU-wide development and policy priorities across the Union, yet balancing this with the specific social, economic, administrative and cultural contexts of the recipient countries and regions. The Commission is able to influence the policy through the design of regulations and the community strategic guidelines and as a control- and monitoring body; however, decisions on the final priorities, the allocation of funds and the selection of projects as well as the monitoring of projects are made on national and regional levels. This flexibility aims to ensure region-specific, tailor-made solutions; at the same time, it complicates the assessment of such a complex policy with decision-making processes becoming more and more opaque as more levels are involved. Ultimately, the effectiveness of spending through the SFs can only be measured at project level.

As a development policy, Cohesion Policy is inherently cross-sectoral – it covers mostly infrastructure, projects in the waste management, energy and transport sectors, but also institution and capacity building (education and training programmes). This cross-sectoral character sets it apart from most other policy domains, yet at the same time creates close interlinkages with a number of them, particularly transport, energy, water-management and biodiversity. Cohesion Policy therefore likely needs a different assessment than most other policies.

Looking at the objectives and the design of the Structural Funds, in principle, they appear to be fit to integrate climate change measures. The objectives identify the Funds as a mainstreaming instrument (to a certain extent), the multi-annual programming approach secures financing over a longer period of time, the additionality criterion requires financial commitment also from national, regional and local governments; the multi-level character is especially relevant for adaptation, as it requires responses on all levels and implementation foremost on regional and local scales.

Even though environmental priorities and sustainability are already integral to Cohesion Policy on a rhetoric and strategic level, their effect has yet to be measured. Climate change mitigation needs to be integrated more comprehensively and adaptation is an entirely new agenda. Helpful lessons from the Environmental Policy Integration (EPI) process are still missing. The following section will delve in more detail into past and ongoing efforts to ‘green’ Cohesion Policy.

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## 5 Greening of EU Cohesion Policy

### 5.1 Environmental policy integration (EPI)

A brief conceptual note on EPI shall introduce chapter five to provide some analytical background for this review. It is based on some of the core work on EPI by Lafferty & Hovden (2002, 2003), Jordan & Lenschow (2008, 2010), Persson (2004, 2009) and others, which can be referred to for detailed discussion of the concept and its different meanings and uses.

Lafferty & Hovden (2003, 9) developed a useful conceptual definition for EPI, pinning down the normative core of EPI (Jordan & Lenschow 2008, 11):

*“Environmental policy integration implies:*

- *the incorporation of environmental objectives into all stages of policymaking in non-environmental policy sectors, with a specific recognition of this goal as a guiding principle for the planning and execution of policy;*
- *accompanied by an attempt to aggregate presumed environmental consequences into an overall evaluation of policy, and a commitment to minimise contradictions between environmental and sectoral policies by giving principled priority to the former over the latter.”*

The authors deliberately exclude regional and local authorities (preferably treating this aspect within the discourse of subsidiarity) as they outline a two-dimensional analytical framework consisting of horizontal (cross-sectoral) and vertical (inner-sectoral) EPI. However, an entire group of researchers in this field, who cooperated in the FP6 project EPIGOV<sup>9</sup>, particularly highlight the multiple relevant tiers of EPI, scrutinising EPI at the global, European, national, regional and local levels. The multi-level aspect is emphasised in a procedural approach to EPI (e.g. EEA 2005, Jordan & Schout 2006), which is weaker compared to the normative perspective and defines EPI as taking environmental considerations ‘into account’, rather than giving them principled priority (Jordan & Lenschow 2008, 11). Persson & Klein (2009) suggest a categorisation into macro-, meso- and micro-levels for the interpretation of EPI in the ODA context. We consider this approach useful also for EPI in the EU context in general and the assessment of EPI in Cohesion Policy in particular (Fig.5.1), as it reflects the multi-level character of the policy. To structure chapter five we will additionally distinguish between policy input (i.e. high-level commitments and legislation) and policy instruments used to achieve EPI. The policy outcome, i.e. the actual impacts of EPI will be included as far as available. The neglect of this dimension of EPI is clearly traced in the literature (Jordan & Lenschow 2010); it is rooted in the yet unsolved problem to arrive at a sound yardstick and firm assessments on outcomes.

In the following sub-sections we will briefly examine EPI efforts in EU Cohesion Policy based on Persson’s three-level classification. For reasons of capacity and time we will not consider national and regional political and administrative contexts, which naturally influence the quality of EPI and its outcome. This will somewhat reduce the complexity of the analysis and will allow us to attribute the policy input to the macro-level and the policy outcome to the micro-level of EPI, while the instruments of EPI appear at all levels. A short overview on EPI on the EU level shall set the context for EPI

<sup>9</sup> EPIGOV is a research project on the modes of governance employed at global, EU, national and regional/local levels to support the integration of environmental concerns into other policy areas (<http://ecologic.eu/projekte/epigov/>, last accessed 16.12.2010).

in Cohesion Policy. For comprehensive discussion for EPI on the EU level see for example Wilkinson (1997 and 2007) or the EPIGOV papers (2006-2008).

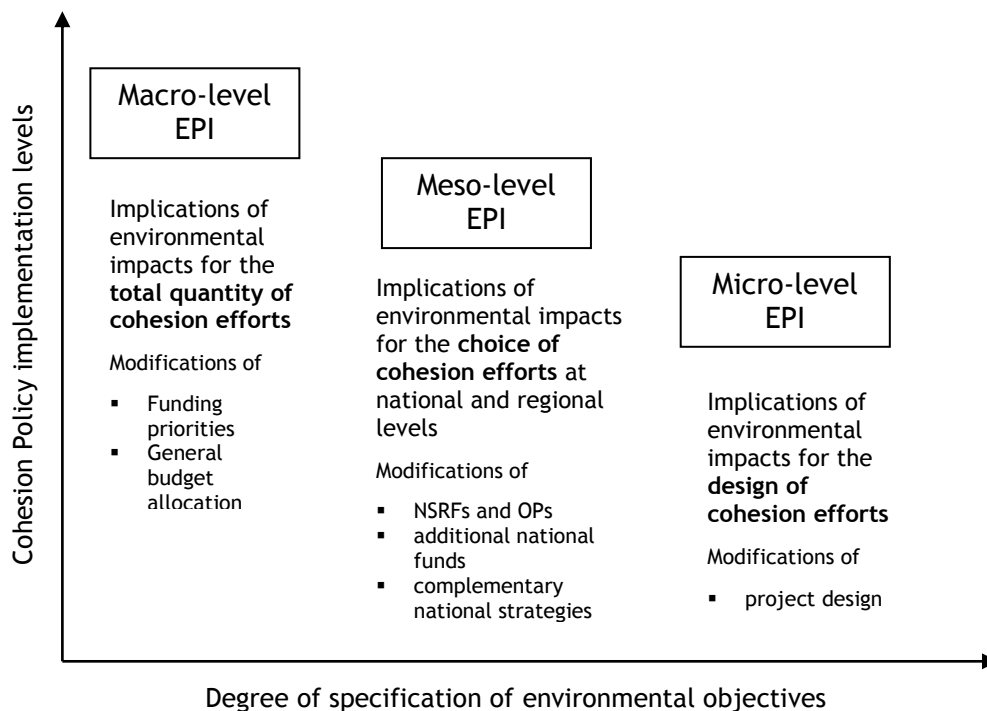


Figure 5.1 Levels and specifications of EPI in EU Cohesion Policy (adapted from Persson and Klein, 2009).

### 5.1.1 EPI in the EU

Environmental policy integration is part of the European scale discourse since the early 70s, when the first Environment Action Programme (EAP) was adopted. The EAP addressed the need that environmental concerns should be considered in all EU sectoral policies. "...the activities of the Communities in the different sectors [...] in which they operate (agriculture policy, social policy, regional policy, industrial policy, energy policy, etc.) must take account of concern for the protection and improvement of the environment," (EC 1973). EPI remained on this largely rhetoric level until the topic was reemphasised by the Brundtland report in the 1980s. The evolution of EPI on the EU level is manifested in several milestones, i.e. high-level policy events.

In 1985, at the same time as Cohesion Policy, EPI became part of the Single European Act and thus constitutional in the European Union. "Action by the Community relating to the environment shall be based on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source, and that the polluter should pay. Environmental protection requirements shall be a component of the Community's other policies." (Article 130r/2) This step was also reflected in the 4<sup>th</sup> EAP.

The Fifth Environmental Action Programme (EAP) approved in early 1993, included EPI as main priority. It supported long-term objectives under the title "Towards Sustainability". The two main principles – (1) integration of the environmental dimension in all major policy and (2) replacing the command-and-control approach with shared responsibility – formed the environmental agenda of the 90s (DG Environment 2005).

In the 1992 Treaty of Maastricht the wording of Article 130r/2 was changed to “*Environmental protection requirements must be integrated into the definition and implementation of other Community policies.*” Finally, the work ‘integrating’ directly referenced EPI.

The Treaty of Amsterdam (1997) further strengthened environmental policy goals in Cohesion Policy by explicitly stating the need for sustainable development in the pursuit of economic activities in the Community (article 2).

At a Council meeting in Cardiff in 1998, heads of state and government brought environmental integration to the highest political level, requiring council formations (i.e. different sectors) to consider environmental issues in their respective activities (DG ENV). Based on a Communication from the Commission, the integration of environmental considerations into all Community institutions was highlighted and tasks for the Council were defined. The two initial pillars of the process were the Kyoto Protocol (Climate change mitigation) and Agenda 2000 (i.a. Cohesion Policy). The key issues addressed by the Cardiff process reflected shortcomings in EPI and Cohesion Policy which had been identified in previous years (cf. chapter 5.1.2) (CEC 1998). The Cardiff process is one of the most ambitious projects ever launched for EPI (Lafferty & Hovden 2002). At the onset of the new Millennium, however, the Lisbon agenda with its strong focus on growth and jobs took the wind out of EPI’s sails (Wilkinson 2007).

The European Council at Gothenburg 2001 added an environmental dimension to the Lisbon Agenda (which initially focused primarily on economic growth and competitiveness) and thus provided the foundation for the first European Sustainable Development Strategy. Sustainable development, though present in policy discourses since the Brundtland report, gained renewed and intensified priority in EU on the EU policy agenda, though both researchers and policy makers failed to fill the term with an operational meaning. Some experts saw this trend as reinforcement of EPI attempts (Lafferty & Hovden 2002), “*The process of integration of environmental concerns in sectoral policies, launched by the European Council in Cardiff, must continue and provide an environmental input to the EU Sustainable Development strategy...*” (CEC 2004, 14)

while others express the concern that the sustainable development hype of the current decade might undermine EPI efforts in drawing attention away from core environmental concerns to social and economic sustainability considerations (Wilkinson 2007). This concern is supported by the fact that only in 2004, the Commission undertook the first and so far only stock-taking of the Cardiff process.

The Sixth EAP, “Environment 2010: Our Future, Our Choice”, covers the period from 22 July 2002 to 21 July 2012. It clearly reflects the new sustainable development focus. The programme is based on the Fifth Environment Action Programme. It is based on four priority areas, climate change, biodiversity, environment and health, and sustainable management of resources and waste (CEC 2001). Other than the previous EAP, which had failed to provide detailed implementation measures, the Sixth EAP set out a different approach to making environmental policies, in the form of Thematic Strategies (TSs). The process of developing the TSs included the wide participation of other Commission directorates-general and stakeholders (Wilkinson 2007).

Two potentially strong EPI instruments and particularly relevant to Cohesion Policy were enforced legally at the macro-level, to be implemented and effective at the meso- and micro-levels. In 1985, the Environmental Impact Assessment (EIA) Directive (85/337/EEC) was adopted. “*The Directive aims to protect the environment and the quality of life, while ensuring approximation of national laws with regard to the*

*assessment of the environmental effects of public and private projects. It is a key instrument of environmental integration,...*" (CEC 2009). Since then the Directive has been amended three times, in 1997 (97/11/EC), 2003 (2003/35/EC) and 2009 (2009/31/EC). EIA is a requirement for all big infrastructure projects (roads, power plants, industrial complexes), i.e. also for those projects funded through the Structural Funds. All Member States introduced regulatory frameworks for EIA; however, the effective implementation is "a continuous challenge" (CEC 2009). Though there is general consent that the directive improved the environmental quality of projects weaknesses remain, such the handling of alternatives in case of negative EIA outcomes, scoping, the quality of EIA reports and monitoring and consultation (Wood 2003, 51). It was foreseen that the EIA directive should later on also apply to programmes and plans; however, the 1990s were arena for an unsuccessful struggle for a more strategic dimension in environmental assessment. Due to the opposition of several Member States) an attempt failed to introduce an SEA directive in the early 90s. Following requests for a legal SEA instrument throughout that decade, in 2001, Directive 2001/42/EC, also known as SEA Directive, was introduced. The deadline for the implementation of the directive in the Member States was 21 July 2004. The effectiveness of SEA is still debated by experts (e.g. ENEA 2008, Theophilou 2010). A report from the Commission on the application and effectiveness of the Directive on Strategic Environmental Assessment (COM/2009/469) finds that "there was an influence, but it is difficult to establish to what extent, the level of public participation was not as high as it might have been, often due to the fact that the SEA was carried out in a very short time, environmental authorities were involved in the decision making process, however, it is often difficult to take all their recommendations into consideration. The quality of the reports was uneven and often very poor." The functioning of SEA for the plans and programmes of Cohesion Policy is integral for successful EPI.

On the Commission level an impact assessment (IA) system was launched in June 2002 (CEC 2002). The Commission thereby decided not to subject its policies and plans to an SEA but a more comprehensive assessment including social and economic impacts as well. The quality of assessments to date, however, has been subject to much criticism (Wilkinson 2007, 22).

After this brief overview of the history of EPI in the EU, we will now move to the efforts to integrate environmental concerns into EU Cohesion Policy. We first look at what we call the macro level (see Figure 5.1 above) – the strategic, EU dimension of Cohesion Policy, before moving down to the meso- (programming) and micro (project) levels of EPI.

### 5.1.2 The environment in Cohesion Policy – the macro level

The first attempt to integrate environmental concerns into EU Cohesion Policy was made after the adoption of the Delors I package. The respective Structural Funds Regulation (2052/88 of 24 June 1988) stipulates that the Structural Funds have to comply with other EU policies including those of environmental protection and aim *inter alia* "to safeguard the environment, to preserve the countryside (e.g. by securing the conservation of natural agricultural resources)". The regulation, though referring to the environment, does not go into further detail how the compliance with other EU environmental policies was to be achieved. Additionally, the EIA directive (see this chapter below) took well into the 90s until it was enforced in the Member States (Wood 2003), hence there were no formal incentives enhancing environmental considerations in Structural Funds Programming.

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The environmental damage caused by large infrastructure projects with financing from the Structural Funds finally led NGOs and sympathising MEPs to protest for more efforts to account for environmental concerns in Cohesion Policy. The pressure of this network became stronger in the early 90s, prompting changes in the Structural Funds regulations influencing the planning and programming on the national and regional levels (Wilkinson 1997, pp 15). Yet continued failure to properly assess programmes and plans on those levels in the programming period starting 1994 on those levels – in part blamed on DG Regio for assuming a casual attitude towards enforcing environmental requirements – fed a renewed campaign started by environmental NGOs and the Environment Committee of the European Parliament. The latter threatened to freeze 50% of the Funds and demanded an environmental 'code of conduct' for the administration of the funds (Wilkinson 1997, 166).

The threat by the Parliament committee and a new Commission taking office in 1995 brought about a change in attitude, reflected in a Communication on Cohesion Policy and Environment (CEC, 1995). The Communication recognises the mutually beneficial and often complementary nature of Cohesion and Environmental Policy and gives recommendations to ensure even greater synergy, particularly in monitoring and evaluation of environmental impacts of the Structural Funds (Bradley 1998). This Communication was relevant in particular for the Cohesion Fund, prompting that a balanced "50/50" distribution between transport and environmental infrastructures – the two, potentially conflicting, funding priorities of the Cohesion Fund – "should be an allocation target that must be aimed at."

The Cardiff process and the environmental ambitions of the Santer Commission in the second half of the 1990s had little effect on the ongoing programming period of the structural fund, but were to mark its shape for the upcoming period from 2000 to 2006. The need to consider environmental impacts is emphasised more strongly both in the regulations and the programme guidelines (CEC 1999). For the first time, climate change was raised as an issue to be integrated in Cohesion Policy. An objective for the development of an efficient, diversified and competitive energy sector was equally included. The main aim at the beginning of the programming period, however, was to limit negative externalities produced by pollution and to mitigate the negative impact of economic and other human activities on the environment and human health, reflected in the funding objectives waste management, water supply and wastewater treatment (ADE 2009, 18).

In the first years of the new millennium, the discussion on environmental integration subsided somewhat, probably due to the new focus on sustainable development and the Lisbon agenda (cf. Wilkinson 2007). Looking at the Community Strategic Guidelines for 2007-2013, it might also be the growing awareness for the need to mitigate climate change that pushed general environmental issues to the backseat to some extent. The 2007 Guidelines explicitly refer to the ratification of the Kyoto Protocol, the EU's emission reduction objectives and the need for cutting greenhouse gas emissions. Energy efficiency (EE) and renewable energy sources (RES) are among the 12 priority areas for Structural Funds investments and are also included for the first time into the scope of the Cohesion Fund for the current programming period. Indirect investments in mitigation, e.g. the prioritisation of rail transport over road transport and the encouragement to improve urban public transport are not only testimony to the new status of climate change, but also show an emerging commitment to green growth. In the end, financial prioritisation was only granted to EE RES and only because it is also a priority of the Lisbon Agenda. A rather negative mid-term revision of the EU strategy gave rise to a new macro-level instrument. Earmarking was implemented to mainstream the Lisbon priorities more effectively into Cohesion Policy.

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60% of expenditure for the Convergence objective and 75% of the regional competitiveness and employment objective were earmarked for the priorities growth and jobs. Information paper No.1. (CEC 2007b) provides the practical information for 'earmarking'.

### 5.1.3 The environment in Cohesion Policy – the meso level

Soon after the first programming period started in 1989, the lack of detail and obligation for national and regional authorities to address environmental concerns in the Structural Funds Regulation became clear. In the early 1990s, the EC Environment Council itself acknowledged this deficiency, stating that “... *there have been difficulties in getting member states to give information on the potential environmental impact of operational programmes submitted for EC funding*”. As with the project EA Directive 85/337, there is no provision for adequate post-hoc monitoring of the outcome of the allocation of funds. Possible measures to improve this position would be a mandatory system of 'environmental profiles', whereby member states would be required to provide a range of information on the environment in the region in conjunction with applications for Structural Fund assistance, or some form of strategic environmental assessment,” (Wilson 1993).

In reaction, the Structural Funds Regulation 2081/93 was amended in 1993, to enhance the environmental dimension of the programming process stipulating that the regional development plans were to include “...***an appraisal of the environmental situation of the area concerned and an evaluation of the environmental impact of the strategy and operations referred to above in terms of sustainable development in agreement with the provisions of Community law in force; the arrangements made to associate the competent environmental authorities designated by the Member State in the preparation and implementation of the operations envisaged in the plan and to ensure compliance with Community environmental rules,***...”(highlights added by the author).

Overall, three requirements to take environmental concerns into account in Cohesion Policy now applied at the meso-level: Firstly, the introduction of a binding, but non-formalised ex-ante environmental appraisal, for the first time requiring regional plans to include a quasi-strategic (Bradley 1999) environmental assessment of the region concerned.<sup>10</sup> An “aide mémoire” (i.e. a modest guidance document of four pages) on environmental appraisal in the regional plans was intended to assist Member States in fulfilling this requirement. However, the quality of these assessments varied considerably across the EU and was often insufficient. Furthermore, only few Member States and regions evaluated their plans and programmes systematically, as the emphasis in the respective regulations was not particularly great (Bradley 1998). Retrospective analysis highlighted several problems, featuring most prominently the absence of a methodological approach for carrying out the environmental assessment (Bradley 1999, 248). Responding to this and similar criticisms, the Commission published a *Handbook on Environmental Assessment of Regional Development Plans and EU Structural Funds Programmes*, which was again non-binding.

Second, all Regional Development Plans, i.e. their priorities and measures were to be appraised as to their environmental impacts in order to keep the plans compliant with national and regional environmental strategies and to be included in the negotiations between the Commission and the Member States. The negotiations might lead to

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<sup>10</sup> Opposed to Regulation No 1052/88 for the period 1989-1993, which referred to environmental integration, but made no provisions as to how it should be implemented.

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changes in priority or design of measures as it allowed the Commission to attach environmental conditions (Bradley 1999, 252) Third, designated environmental authorities were supposed to supervise the consideration of environmental issues in Cohesion Policy, however, their limited inclusion and activity continued to be subject to criticism (Bradley 1999, 254). Other points of critique related to the missing environmental indicators for the monitoring and ex-post evaluation of the plans (Balfors 2002, Bradley 1999, Clement & Bachtler 1997). On the whole, the steps to strengthen EPI in Cohesion Policy had only produced superficial effects at this stage.

The introduction of the European Network of Environmental Authorities for Cohesion Policy (ENEA) in September 2004 was a renewed attempt to better involve and support the meso-level in integrating environmental considerations in Cohesion Policy. It also reflects the turn to rely on new modes of governance (Wilkinson 2007) to achieve EPI. ENEA is a platform for the 27 environmental authorities for the Structural Funds as well as environmental representatives from the candidate countries, international organisations and initiatives (e.g. EEA, REC, EPRO, ENCORE), the Environmental NGOs' Coalition, who all participate as observers. The network is chaired by DG ENV, but other DGs (REGIO, EMPL, TREN, AGRI) are represented as well. ENEA provides space for DG ENV to inform EAs about new or updated Community legislation and future policy options and in turn allows EAs to share best practices and concerns. Several working groups were set up for two year terms to focus on various core issues, such as SEA, the Lisbon Agenda, Climate Change and Water Policy.

The SEA directive of 2001, which had not yet applied to programme documents of the 2000-2006 period (Feldmann et al. 2001), is fully in force for NSRFs and OPs in the current programming period. ENEA (2008) reported on SEA and Cohesion Policy and found the impact of SEAs on the programmes limited: "*Assessment instruments, availability of data, capacity of experts, cooperation of administrations, mechanisms for participation must be strengthened if SEA wants to show tangible results and not be seen as an additional administrative burden*" (ENEA 2008, 39). It seems that the problems are generally the same as with the not legally enforced environmental appraisal requirements in former programming periods. Some EU countries had applied SEA (e.g. the UK and the Netherlands) before the EU directive made its use obligatory, but others, particularly the new Member States, took considerable time to establish SEA legislation. Therefore, limited research has been conducted so far on the effectiveness of SEA in general and in Cohesion Policy in particular and work in the field will be needed.

#### 5.1.4 The environment in Cohesion Policy – the micro level

The micro-level or project level of EPI is almost out of the reach of the Commission's influence and yet is very important; it is here that the concrete outcomes of EPI at all other levels manifest themselves and where their impact should be measured. EIA is the only instrument available for this level and it is only obligatory for major projects.

There are no comprehensive quantitative analyses on the outcomes and impacts of EPI on the ground and also qualitative assessments are still limited. After the programming period 2000-06, the Commission initiated the largest evaluation project of the Structural Funds so far, covering for the first time also environment and climate change mitigation<sup>11</sup>. The report shows that the contribution of the EU Funds in terms of environmental investments in relation to GDP is relatively high in the

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<sup>11</sup> As this evaluation was published in 2009, it did not initially influence the current programming period.

EU-10 and the former cohesion countries (i.e. Greece, Ireland, Portugal, Spain) compared to the EU-15 (ADE 2009, 34), while it is comparably small considering the average of the EU-25.

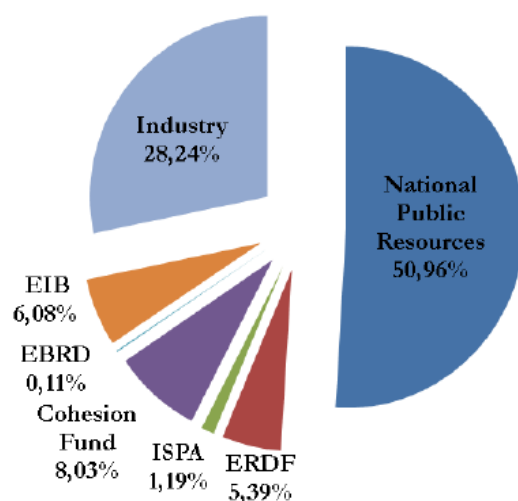


Figure 5.2 EU-25, investments in environmental infrastructure by main sources of funds (2000-20006). Source: ADE 2009, 29.

After this discussion on the state of play of EPI in the context of EU Cohesion Policy, in the following sections, we will ‘zoom in’ and explore the challenges that EPI’s ‘sibling’, climate policy integration, poses for Cohesion Policy, as well as the steps taken so far in this regard.

## 5.2 Climate Policy Integration (CPI)

Climate policy integration (CPI), also referred to as climate change mainstreaming, has been relatively little covered in the scientific literature. CPI so far has been mostly discussed in the context of development assistance (Klein et al. 2005, Persson & Klein (2008), Persson (2009) and Gupta et al. (2009)), and has only recently been addressed also in a domestic policy context (see e.g. Mickwitz et al., 2009). While climate change mitigation up until now has often been treated as part of EPI and been discussed in this context, adaptation to climate change represents an entirely new mainstreaming challenge, and one that to some extent transcends the strictly environmental domain. Furthermore, the different characteristics of mitigation and adaptation make it difficult to lump them together in the discussion of mainstreaming; while progress on mitigation mainstreaming may be more concrete and tangible in some cases, the complex nature of adaptation and immense spatial variations that it implies make its analysis even more daunting.

Mickwitz et al. (2009) developed a definition of CPI based on the work of Lafferty & Hovden (2002, 2003) on EPI, excluding, however, the aspect of principled priority, something that would be hard to maintain when weighing climate concerns against all other aspects of development. They define CPI as

*“the incorporation of the aims of climate change mitigation and adaptation into all stages of policy-making in other policy sectors, complemented by an attempt to aggregate expected consequences for climate change mitigation and adaptation into an overall evaluation of policy, and a commitment to minimise contradictions between climate policies and other policies.”*

Given the very recent nature of CPI compared to EPI, the following analysis of CPI will necessarily be much shorter. We will base it on the same three levels of analysis introduced by Persson & Klein (2009) and used in the previous sections on EPI. However, since no concrete measures regarding CPI have been taken so far in the context of Cohesion Policy, there are no particular instruments or outputs applicable to the meso- or micro-levels.

### 5.2.1 CPI in the EU

Given that the Kyoto Protocol was one of two stated priority objectives of the Cardiff Process, the integration of climate change mitigation was an integral part of EPI at the macro-level from 1998 onwards. Explicitly, however, CPI is a much more recent topic. The following paragraphs present some key milestones in this regard, without detriment to other development that might deserve mentioning as well.

In terms of mitigation, the 2008/2009 EU budget review received much attention from environmental interest groups. Several reports were published on the greening of EU finances, particularly as an instrument to mitigate climate change (Adelle et al. 2008; Behrens 2008; Green Alliance 2007, 2010). All of them criticise the past and current orientations of the budget and demand a drastic change in direction, i.e. major investments in renewables etc., and no counter-productive investments (e.g. roads, fossil fueled power plants and any other high emission infrastructure). The reports also point out the worrying spending patterns of those countries that receive the most financial aid, i.e. convergence and cohesion countries. The authors are concerned that the new Member States and now Cohesion countries will follow their predecessors, Greece, Ireland, Portugal and Spain, in rising greenhouse gas emissions while subsidised by the Cohesion Fund. They demand an immediate and radical greening of the Structural Funds (cf. Adelle et al. 2008; Behrens 2008; Green Alliance 2007, 2010).

Concerning adaptation, the Commission's Green (2007a) and White (2009c) Papers on Adaptation were the first EU-level documents to state the need to integrate adaptation into the following EU policy sectors: Health and social policies; agriculture and forests; biodiversity, ecosystems and water; coastal and marine areas; and production systems and physical infrastructure. The document particularly highlights the role of Cohesion Policy for the last areas; however, most of the sectors listed are also related to aims and priorities of Cohesion Policy.

One of the most significant actions taken by the Commission in the pursuit of CPI was the establishment of the new Directorate for General Climate Action (DG Clima) in 2010. One of DG Clima's explicit responsibilities is to make sure "that the climate dimension is appropriately present in all Community policies..." (DG Clima 2010).

### 5.2.2 Climate change in EU Cohesion Policy

The integration of climate change mitigation into the Structural Funds commenced with the 2000-2006 programming period. Even though accorded less priority than waste treatment and wastewater management, energy efficiency and renewable energy sources featured prominently in the Commission's programme guidelines (CEC 1999). The current programming period since 2007 surely has significantly more budget allocated to climate change mitigation than in the previous funding period, particularly due to the fact that energy efficiency and renewable energy sources are considered part of the Lisbon Agenda for which more than two third of the ERDF funds are earmarked.

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The report “Improving Climate Resilience of Cohesion Policy Programmes” by Baltzer et al. (2009) is possibly most concrete and extensive in dealing with the challenge of (mitigation) CPI in Cohesion Policy. Based on interviews, the authors, together with experts from ENEA, developed recommendations on how to integrate climate change into all phases of the programming process of the Structural Funds. They stipulate among other things the incorporation of climate change terminology into all programmes, emphasise the necessity of earmarking of minimum allocations for climate change, and call for minimum emission reduction requirements for project calls and improved call procedures as well as EPI checklists for the selection process. The report separately addresses communication as an area for improvement for both managing authorities and project proponents. Finally, it stressed the need for stronger pressure from the European Commission to measure effects and the inclusion of climate change criteria in ex-ante evaluations. Though the report supposedly includes climate change adaptation, the final recommendations contain only little reference to the latter.

With regard to adaptation, no active steps have been taken so far. Climate change adaptation is not included in the Structural Funds regulations or the Community Strategic Guidelines, even though adaptation-relevant priority themes already exist, e.g. on risk prevention, health infrastructure and promotion of biodiversity and nature protection. Only one of the priority themes (climate change mitigation and adaptation) explicitly refers to climate change. Adaptation is mentioned, however, in the recent 5<sup>th</sup> Cohesion Report (DG Regio 2010): “*The severity of the impact of climate change will vary across the EU according to geophysical vulnerability, the natural and human capacity to adapt, and the level of economic development. In the face of these variations, it is crucial for regions to plan an adaptation strategy most appropriate for them.*”<sup>12</sup>

### 5.3 Conclusion

We identify two coarse developments looking at the progress of EPI and CPI in Cohesion Policy. The first refers to EU policy discourse relating to EPI and CPI, which manifests itself in high-level processes and normative commitments, the second refers to the different instruments and approaches used to achieve EPI.

(1) The first development is of a discursive nature and refers to the macro level of EPI and CPI. It started out as an EPI focused discourse in the 1980s and 1990s guided by the 5th EAP and the Cardiff process. The discourse is reflected in the ever more concrete integration of environmental considerations in Structural Funds regulations and increased budget allocations. In the new Millennium, EPI to some extent gave way to a new focus on sustainable development in the light of the Lisbon and Gothenburg Agendas, a development. Over the past few years, the issue of climate change, in particular mitigation, and the need to integrate it across policy sectors has moved up rapidly on the EU policy agenda and has to some extent also impacted the design of Cohesion Policy for the current programming period (2007-2013). Reducing emissions and increasing energy efficiency currently appears to be the highest environmental priority in EU Cohesion Policy.

(2) On the meso-level a shift in EPI instruments can be identified. In the 1980s and 1990s the ground was laid for important legal instruments such as the EIA directive

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<sup>12</sup> However, only the full version explicitly refers to climate change adaptation, while the summaries and conclusions (which are the only documents available in all EU languages) do not mention adaptation.

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and the SEA directive. The slow implementation of these instruments in the Member States and the criticism about their effectiveness are well known problems. However, it is not clear whether these points have led the Commission to put emphasise on new modes of governance (e.g. networks) throughout the last decade.

In closing, environmental issues as well as climate change concerns have certainly become more prominent in EU Cohesion Policy over the last decade. A number of instruments have been implemented that have the potential to strengthen EPI and to some extent also CPI in this policy domain. CPI in particular is advancing fast on the macro-level, although instruments, let alone outcomes, are not yet available. The adaptation (EIA and SEA) or extension (earmarking) of existing instruments appear particularly promising in this regard. The Commission promised to develop guidelines by 2011 to take climate impacts into account in the EIA Directive (CEC 2009b). However, integrating adaptation into Cohesion Policy might ask for the application of different mechanisms as well.

At the same time, as of now, there is little to no information available on what impact efforts regarding EPI and CPI have on budget allocations and project design on the ground. This is no doubt due to the complex and multi-level nature of the Structural Funds, as well as methodological and data issues in measuring impacts. However, limited knowledge on the record of past EPI initiatives also makes it difficult to identify lessons learned that might be relevant for similar efforts with regard to climate mainstreaming in the future.

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## 6 Evidence for CPI in Member States' National Strategic Reference Frameworks

### 6.1 Introduction and methodology

After the preceding review on integrating environmental and climate change concerns into Cohesion Policy, this chapter presents a short exploratory study examining evidence for climate mainstreaming in EU Cohesion Policy in the current commitment period.

The material analysed consists of Member States' National Strategic Reference Frameworks (NSRFs), the reference documents for the programming of European Union Funds at national level for the 2007–2013 period. NSRFs are supposed to ensure that the assistance from the Funds is consistent with the Community strategic guidelines on cohesion and identifies the link between Community priorities, on the one hand, and the national reform programme, elaborated in the context of the Lisbon agenda, on the other. The 2006 community strategic guidelines (CSG) do not in any way refer to climate change adaptation. However, the recommended "guidelines for action" for the first out of three principal priorities for Cohesion Policy outlined in the CSG, stipulates "*promoting, in addition to the investments in sustainable energy and transport covered elsewhere, investments that contribute to the EU-Kyoto commitments.*" Also beyond the earmarking provision for the first funding priority, there is thus a clear normative commitment in the CSG for mitigation-related expenditure for the 2007-2013 period.

The scope of our analysis includes 23 out of Member States' NSRFs, written in four different languages (German, English, French, Dutch). We were unable to retrieve the NSRF of Cyprus, and a lack of language skills prevented us from analysing the Danish, Finnish and Italian plans. The content, style and length of the NSRFs largely vary. The plans are usually prepared by national authorities, although more bottom-up or mixed processes have also been observed in a number of cases (Poleverani et al., 2006). Their length ranges from 40 to almost 400 pages (with an average of maybe 150 pages), and their content may not always be as strategic as stipulated in the CSG, remaining rather vague and general in places (ibid).

All plans were written in 2006, thus to some extent predating the high profile that climate change acquired on the EU policy agenda from 2007 onwards through the "20-20 by 2020" EU mitigation targets and the 2008 EU climate and energy package. Similarly, the policy process around adaptation did not gain serious traction at the EU level until the Commission's 2007 and 2009 White and Green Papers on adaptation. Nonetheless, in 2006, there was already a significant degree of climate policy-making activity both in Member States and at the EU level, catalysed inter alia by the long-awaited ratification of the Kyoto Protocol in 2005. Thus, we can safely assume that some extent of climate policy integration in Cohesion Policy may already have been happening and we expect the NSRFs to provide a good first indication to what extent Member States have addressed climate change (both in terms of mitigation and adaptation) in their national cohesion policy planning across the Community.

We used the qualitative analysis software MaxQDA for our analysis, relying on key word searches in four languages (see Table 6.1 for the key words used), and subsequently analyzing and manually coding the material wherever the key words retrieved appeared in relevant contexts. Only some of the NSRFs contain concrete information on financial allocations to priority themes that might allow for conclusions

on climate-related investments through the Structural Funds. Therefore, the plans mainly lend themselves to a qualitative assessment of the extent to which climate-related issues have been accounted for. In line also with the overall focus of our work package, whose primary focus is on adaptation, the present analysis looks at how climate change broadly as well as adaptation concerns in particular have been addressed in the plans, leaving the framing of mitigation-related issues largely

Table 6.1 Terms for key word search for NSRF analysis.

<b>Climate change</b>	climate change; climatic change; changing climate; global warming; klimaatverandering; klimawandel; klimaveränderung; klimaerwärmung; globale erwärmung; changement climatique; rechauffement climatique; rechauffement du climat
<b>Adaptation</b>	Adaptation; adaptatie; Anpassung; aanpassing
<b>Vulnerability</b>	Vulnerability; vulnérabilité; vulnerabilität; kwetsbaarheid; vulnerabiliteit; Verwundbarkeit
<b>Kyoto Protocol</b>	Kyoto
<b>National climate strategy/ climate action plan</b>	-> manually coded following key word search for “climate change” synonyms, additionally search for title and acronym of the respective national documents
<b>National adaptation strategy</b>	-> manually coded following key word search for “adaptation” synonyms
<b>Sea level rise</b>	Sea level; Meeresspiegel; niveau de la mer; zeespiegel, each time followed by manual coding
<b>Extreme weather events</b>	Extreme weather event; weather extreme; Wetterextreme; temps extreme; extrêmes climatiques; extreme weersomstandigheden; extreem weer;
<b>Drought</b>	Drought; dry spell; Dürre; Trockenheit; sécheresse; droogte; droogheid;
<b>Flood</b>	Flood; inondation, inundation; débordement, marée haute; Überschwemmung; Flut; overstroming; watersnood; inundatie;

More specifically, we examined where and in what context climate change in broad terms was referred to and discussed in the plans, and where this was linked to operational guidance for programming. Secondly, we were interested in the extent of normative policy coherence apparent from the plans, i.e. to what extent they referenced and endorsed other relevant climate and environment-related policies and strategies. The extent to which the need to adapt to climate change, as well as threats resulting from specific climate change impacts are addressed formed the third focus of our analysis.

## 6.2 Evidence for CPI in the NSRFs – preliminary findings

### 6.2.1 Attention to climate change and link to funding priorities

All 23 NSRFs analysed explicitly refer to climate change (or a synonym, see table 6.1), although to largely varying degrees and in different contexts. Lithuania only mentions climate change once in its plan, referring to the “negative impact of the growing



economy and global warming on the environment” in a table summarizing a SWOT analysis of the country’s development potential, whereas climate change is a recurrent theme for instance in the UK NSRF – the term appears 12 times in the British document.

Most often, climate change is mentioned in passing in the context section describing environmental issues in the country. In six cases (France, Greece, Hungary, Slovenia, Slovakia, and the UK), an explicit link is made between climate change and countries’ strategic vision for cohesion funding objectives and funding themes. The Hungarian NSRF for instance stipulates that “actions related to climate change should be treated as a priority within all sectors and areas addressed in the framework of the NSRF.” Both mitigation and adaptation needs are mentioned in this context.

In even fewer cases, the acknowledgement of climate change gives rise to concrete operational implications for Structural Funds programming; the exception here is France which explicitly endorses a principle of “carbon neutrality” at the regional programming level for its Structural Funds investments.<sup>13</sup>

### 6.2.2 Evidence for normative climate policy integration

A second focus of analysis was the extent to which the NSRFs provided evidence for normative policy integration (see table 6.2). By normative policy integration, we mean the extent to which the plans contextualize Structural Funds programming with other EU and national policy strategies and agreements related to climate change and sustainable development.

Given that, as mentioned above, the 2006 CSG explicitly reference the EU’s Kyoto commitments, we would expect to find this back also in the national plans. This was indeed the case for 18 out of 23 NSRFs, except for the ones from Lithuania, Malta, Poland, Sweden, and the Netherlands.

In a next step, we examined whether NSRFs referred to Member States’ strategies or action plans on climate change. At the time of the NSRFs being drafted, climate action plans or mitigation strategies were in place in 18 out of the 23 countries included in our analysis (see table). Yet only 7 NSRFs included a reference to their countries’ umbrella documents on climate change, whereas 11, where such strategies or actions plans were also in place, did not. When the NSRFs were being developed in 2006, only very few Member States had adopted national adaptation strategies. In our sample, this was the case only for France and Spain – the former referenced its adaptation strategy in its NSRF, whereas the latter did not.

Finally, taking a step back from climate change specifically, we checked for links made with the EU’s and Member States’ sustainable development strategy. With references in 12 NSRFs, national-level strategies were referred to slightly more often than the EU-level strategy (7 references).<sup>14</sup> There was no clear pattern visible that where a link was made to the EU document, the national document was also quoted, or vice versa.

<sup>13</sup> To this end, France has also developed and implemented a dedicated software tool called “NECATER”(Neutralité Carbone des TERritoires). The purpose of NECATER is to evaluate the aggregate carbon impact of the ensemble of projects implemented in one region. See [http://www.datar.gouv.fr/IMG/Fichiers/DEVELOPPEMENT\\_DURABLE/Necater\\_presentation.pdf](http://www.datar.gouv.fr/IMG/Fichiers/DEVELOPPEMENT_DURABLE/Necater_presentation.pdf)

<sup>14</sup> In 3 of the Member States analysed, no national sustainable development strategy was in place in 2005/2006.

Table 6.2 Normative policy integration in the NSRFs.

Country	National umbrella document on climate change/mitigation in place in 2006/2007?	Referenced in NSRF?	National adaptation strategy in place in 2006/2007?	Referenced in NSRF?	Reference to EU Sustainable Development Strategy?	Reference to national sustainable development strategy?
<b>Austria</b>	Klimastrategie (2002)	yes	--	--	no	yes
<b>Belgium</b>	Plan national climat (2002)	no	--	--	yes	<i>none in place</i>
<b>Bulgaria</b>	National Climate Change Action Plan (2002)	yes	--	--	no	no
<b>Czech Republic</b>	National Program To Mitigate the Impacts of Climate Change (2004)	yes	under development	yes	no	no
<b>Estonia</b>	National Program of Greenhouse Gas Emission Reduction 2003-2012 (2004)	no	--	--	yes	no
<b>France</b>	Plan Climat Français (2004)	yes	in place since 2006	yes	yes	yes
<b>Germany</b>	Nationales Klimaschutzprogramm (2005)	yes	--	--	yes	yes
<b>Greece</b>	Second National Programme for Reducing Greenhouse Gas Emissions 2000-2010 (2003)	no	--	--	no	no
<b>Hungary</b>	<i>none in place</i>	--	--	--	yes	<i>none in place</i>
<b>Ireland</b>	National climate strategy (2000)	yes	--	--	yes	yes
<b>Latvia</b>	<i>none in place</i>	--	--	--	no	no
<b>Lithuania</b>	<i>none in place</i>	--	--	--	no	yes
<b>Luxembourg</b>	National Strategy for Reducing GHG Emissions (2000)	no	--	--	no	yes
<b>Malta</b>	"National Action Plan on Climate Change	no	--	--	yes	yes
<b>Netherlands</b>	National Climate Policy Implementation Plan (1999/2000)	no	--	--	no	no
<b>Poland</b>	Poland's Climate Policy. Strategies for Greenhouse Gas Emission Reductions in Poland until 2020 (2003)	no	--	--	no	no
<b>Portugal</b>	National Climate Change Programme (2004)	no	--	--	no	yes
<b>Romania</b>	None in place	--	--	--	yes	yes

Table 6.3 continued - Normative policy integration in the NSRFs.

Country	National umbrella document on climate change/mitigation in place in 2006/2007?	Referenced in NSRF?	National adaptation strategy in place in 2006/2007?	Referenced in NSRF?	Reference to EU Sustainable Development Strategy?	Reference to national sustainable development strategy?
<b>Slovak Republic</b>	None in place	--	--	--	<b>yes</b>	<b>yes</b>
<b>Slovenia</b>	Action Plan for Reducing GHG Emissions (2003)	no	--	--	no	yes <sup>15</sup>
<b>Spain</b>	<i>None in place</i>	--	in place since 2006	no	no	<i>none in place</i>
<b>Sweden</b>	Swedish climate strategy (	no	--	--	<b>yes</b>	no
<b>United Kingdom</b>	UK Climate Change Programme	<b>yes</b>	--	--	no	<b>yes</b>
<b>Summary</b>	<b>17 approved, 6 not in place</b>	<b>10 not referenced, 7 referenced</b>	<b>3 in place or under development</b>	<b>2 referenced</b>	<b>13 not referenced, 10 referenced</b>	<b>12 referenced, 8 not referenced, 3 not in place</b>

### 6.2.3 Attention to climate change impacts and adaptation

In a last step, in line with the focus of our work package, we were interested to investigate how much, if any, attention NSRFs dedicate to the potential impacts of climate change and to adaptation needs. Table 6.3 presents the results of our analysis.

Table 6.4 Attention to adaptation and impacts in the NSRFs.

	Explicit reference to vulnerability to climate change	Explicit reference to (need for) adaptation	Impacts mentioned and explicitly linked to climate change	Potential climate change impacts mentioned, explicitly linked to climate change (Y/N)				
				Extreme weather events	Flooding	Coastal erosion	Sea level rise	Drought
Austria	no	no	no	yes, not linked	yes, not linked	no	no	no
Belgium	no	no	no	yes, not linked	yes, not linked		no	yes, not linked
Bulgaria	no	no	no	yes, not linked	yes, not linked	no	no	no
Czech Republic	no	no	no	yes, not linked	yes, not linked	no	no	no
Estonia	no	no	no	no	no	no	no	no
France	<b>yes</b>	no	<b>yes - threat to biodiversity due to sea level rise, and extreme events )</b>	<b>yes, linked</b>	yes, not linked	yes, not linked	<b>yes, linked</b>	no

<sup>15</sup> National development plan recognized by EU as SD strategy.

Table 6.5 continued - Attention to adaptation and impacts in the NSRFs.

	Explicit reference to vulnerability to climate change	Explicit reference to (need for) adaptation	Impacts mentioned and explicitly linked to climate change	Potential climate change impacts mentioned, explicitly linked to climate change (Y/N)				
				Extreme weather events	Flooding	Coastal erosion	Sea level rise	Drought
Germany	no	no	no	no	yes, not linked	no	no	no
Greece	no	no	<b>yes – threat to tourism</b>	yes, not linked	yes, not linked	no	no	no, but forest fires and desertification, not linked
Hungary	no	<b>need for protective measures (e.g. green areas)</b>	<b>yes - hazards, floods</b>	<b>yes, linked</b>	<b>yes, linked</b>	<b>Yes (not of coasts, but of soils and shores), linked</b>	no	<b>yes, linked</b>
Ireland	no	no	no	no	no	no	no	no
Latvia	no	<b>general reference to adaptation needs</b>	no	no	no	no	no	no
Lithuania	no	no	no	no	no	no	no	no
Luxembourg	no	no	no	no	yes, not linked	no	no	no
Malta	no	no	<b>yes - flooding</b>	no	<b>yes, linked</b>	yes, not linked	no	no
The Netherlands	<b>yes</b>	<b>yes – „room for rivers“</b>	<b>yes - flooding</b>	no	<b>yes, linked</b>	no	no	no
Poland	no	no	no	no	yes, not linked	no	no	no
Portugal	<b>yes</b>	<b>yes</b>	<b>yes – threat to coastline</b>	no	yes, not linked	<b>yes, linked</b>	not explicitly	Yes, not linked
Romania	no	no	<b>yes - flooding</b>	no	<b>yes, linked</b>	yes, not linked	no	desertification, not linked
Slovakia	no	no	no	no	yes, not linked to	no	no	no
Slovenia	<b>yes</b>	<b>yes</b>	<b>yes - flooding</b>	no	<b>yes, linked</b>	no	no	<b>yes, linked</b>
Spain	no	no	no	no	yes, not linked	no		forest fires and desertification, not linked
Sweden	no	no	no	no	no	no	no	no
United Kingdom	no	<b>yes</b>	<b>yes, but only to emphasise mitigation needs</b>	<b>yes, linked</b>	no	no	<b>yes, linked</b>	no

Summarising the findings from Table 6.3, not surprisingly, climate change adaptation and impacts receive little attention across most of the NSRFs. 10 plans do not cover these issues at all, whereas most of the others address them in passing, primarily in the context of a broader description of environmental risks. The notion of vulnerability to climate change features explicitly in four NSRFs (France, the Netherlands, Portugal and Slovenia). Six plans explicitly stress the need to adapt to climate change (France, Greece, Hungary, Malta, Portugal, Romania, Slovenia).

With regard to impacts from climate change, natural disasters and flooding are mentioned most frequently in the NSRFs, often, but not always linked to climate change (see table 6.3). This is in line with the 2006 CSG; the latter does not refer to climate change adaptation, yet it prominently features the “prevention of natural risks” in its guidelines. The fact that many Central and Eastern European Member States suffered severe damages from large-scale flooding in the first years of the new millennium probably contributed to the comparatively high profile of this issue in the NSRFs, too. Other climate change-related phenomena and impacts, such as sea level rise, coastal erosion or increasing risks from droughts are picked up in just a few plans, and only occasionally is a clear link made to climate change.

As stated above, adaptation is in all cases part of the general description of environmental risks. Nowhere were adaptation needs in any way linked to cohesion funding priorities, nor was the need to enhance the resilience of projects to climate change emphasized in any of the plans that we analysed.

### 6.3 Conclusion

The foregoing document analysis, examining evidence for climate policy integration in 23 out of 27 Member States’ NSRFs, presents a first systematic attempt to gain insights to what extent countries incorporate climate change address in their national reference documents for the ongoing programming period. What conclusions can we draw from the above?

First of all, our analysis of the plans does not necessarily confirm certain preconceived ideas that ‘the green leader states’ might be ahead with integrating climate change concerns into their cohesion policy. Unlike one might expect, it is not Germany and the Scandinavian countries that make statements to this effect, but, in addition to the UK and France, Hungary, Slovenia, the Slovak Republic and Greece – not countries usually known for their green outlook on policy. To what extent these findings are matched by financial allocations to climate-relevant funding priorities is an interesting question that deserves further research.

Based on our reading of the NSRFs, it is not necessarily straightforward to identify clear leaders with regard to mainstreaming climate change into Cohesion Policy – maybe with the exception of France, which clearly leads the way with its principle of “carbon neutrality” for Structural Funds investments. For instance, emphasis on the NSRF’s coherence with climate policy objectives rarely goes hand in hand with attention dedicated to the issue of adaptation. This is the case for some Central and Eastern European countries in particular, who do well on the latter, but less so on the former. Moreover, few of the Northern European Member States touch upon climate change adaptation in their plans – which is not necessarily surprising, as the issue might simply be somewhat less relevant to them than for instance for their Mediterranean counterparts.

All these are of course very preliminary findings that deserve to be further explored, confirmed or contested in subsequent research. As pointed out in the introduction to this chapter, NSRFs are often vague and general documents – so it would be interesting to examine to what extent the patterns we see in them are confirmed by other measures, for instance financial allocations in operational programmes or climate awareness of managing authorities of the Structural Funds. Furthermore, as mentioned before, the documents analysed date back to 2006/2007 – and again it would be relevant to check back in later programming documents (for instance mid-term evaluations) to what extent attention to this issue has increased since.

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## 7 Research and knowledge gaps

Concluding, we can say that the nexus between climate change and regional policy has been little studied so far. The Structural Funds are the source of a significant share of infrastructure investments, especially in the new Member States – yet to what extent (and if at all) these enhance the climate resilience and adaptive capacity of regions remains largely unclear. Similarly, on the mitigation side, Structural Fund investments could potentially make a substantial contribution to low-carbon growth; yet they could also contribute to rising greenhouse gas emissions, for instance through the expansion and updating of road networks instead of investing into the long called-for modal shift in the transport domain.

We learned from the analysis that though the environmental policy integration (EPI) discourse is giving way to a climate policy integration (CPI) discourse, no EU or national climate change policy strategies for regional development have been developed yet. Research is also rare, both on mainstreaming climate change in regional policy (and the effectiveness of such efforts) and on the potential to enhance mitigative and adaptive capacities through reorientation of regional policy.

Thus, both in quantitative and in qualitative terms, important research gaps remain in this domain

Quantitatively:

- What is the current contribution of Structural Funds investments to climate change mitigation and adaptation?
- What is the potential contribution of Structural Funds investments to (1) increase resilience/adaptive capacity in relevant sectors and regions; (2) support regional adaptation efforts; and (3) mitigate greenhouse emissions?

Qualitatively:

- What are the barriers to climate policy integration (CPI)/climate mainstreaming in Cohesion Policy from macro- to micro-level and how can these be overcome?

In WP6 we plan to proceed as follows:

Still as part of the **baseline assessment**, but leading up to the second step of sectoral case study analysis outlined in the RESPONSES research protocol (i.e. impact assessment/vulnerability analysis and mitigation potential analysis), we will attempt to answer the following questions:

- are there any regulations/policies guiding the application of the current framework of priority themes/earmarks related to CC adaptation?
- to what extent is there evidence for climate policy integration in the operational programmes across Member States (continuing the approach taken in Chapter 6 of this report)?

In the (largely quantitative) **impact assessment/vulnerability analysis** which will be based on an indicator based assessment for infrastructure in the EU (see Chapter 2), we will then examine the following questions:

- How large are the risks of climate change in the EU, for different types of infrastructure under different types of weather hazards?
  - What are the causes of changes in exposure and vulnerability/adaptive capacity in different regions, and under different scenarios?
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- what is the contribution of the Structural Funds to the degree of adaptive capacity of the EU regions, how much is allocated?
- Is there a (mis-)match between Structural fund allocations (that can potentially be used for adaptation / mitigation) and observed/ predicted/ modelled climate change impact?

The **mitigation potential analysis** is not straightforward for this RESPONSES sector since the decentralised nature of Cohesion Policy makes it hard to come by precise figures on mitigation-related investments through the Structural Funds (the only relatively easily obtainable data relate to planned allocations per priority theme). Linking these investments to emissions (and subsequently coming up with resulting abatement potential) is even more difficult and outside the scope of expertise available in WP6. It should be possible to identify the extent of allocations for mitigation-relevant, 'high' and 'low' carbon investments for the ongoing commitment period. The integrative activity will cover a part of this analysis, as it will focus on the relevance of Structural Funds investments in renewable energy sources and their role compared to other investments in the green energy sector.

In the following **policy options generation** step, we will seek to get a better grasp how Structural Funds investments play out 'on the ground' and building on this, develop options how climate change concerns (both in terms of mitigation and adaptation) could be better integrated into EU Cohesion Policy. The following ideas exist for this research step so far:

- A case study that assesses the extent of vertical (i.e. multi-level) CPI in one particular subject area (e.g. transport?) across a limited yet representative set of Member States/regions, through interviews and document analysis from the meso- to the micro-level. Again, this should provide information on how CPI 'trickles' down across the various levels, what the main obstacles are and how these could be overcome.
- A survey among managing authorities across the EU regarding the awareness, resources and knowledge needs of their staff with regard to climate change. This should provide insights how current efforts at CPI are perceived at the micro level of Cohesion Policy, what appraisal practices (if any) are currently used to account for climate change concerns in the project cycle and how they might be adjusted, and last but not least, what concrete possibilities and limitations the micro level sees to strengthen CPI in Cohesion Policy.
- A workshop with Cohesion Policy experts in Brussels to discuss entry points, opportunities and limits for CPI at the macro and meso-levels.

Research steps and methodology for the last appraisal step, the '**integrated assessment**' still remain to be elaborated.

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