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Strategic Environmental Assessment
of the transnational cooperation programme
CENTRAL EUROPE 2020

Draft Environmental Report

Component 5: Strategic Environmental Assessment

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0. Non-technical summary

Introduction

The Operational Programme CENTRAL EUROPE 2020 (OP CE 2020) is a European Territorial Cooperation Programme. According to the SEA Directive EU/2001/42 a Strategic Environmental Assessment (SEA) must be implemented as part of the programming procedure of the OP CE 2020. The SEA aims to assess the effects of the OP CE 2020 on the environment. In this draft environmental report the OP CE 2020 draft version 3.2 (November 2013) forms the basis for the assessment of possible effects on the environment resulting from the implementation of this programme.

Core contents of the Operational programme CE 2020

The overall strategy of the Operational Programme CE 2020 is embedded in the superordinate objectives and strategies of the EU. Particularly relevant in this regard is the EU 2020 Strategy. Moreover, the CENTRAL EUROPE programme must be in line with the specifications set by the EU Common Strategic Framework for EU Cohesion Policy. In this context, the CENTRAL EUROPE 2020 Programme has specified the following four priority axes:

Priority axis 1: Cooperating on innovation to make CENTRAL EUROPE more competitive

Priority axis 2 : Cooperating on low carbon strategies in CENTRAL EUROPE

Priority axis 3: Cooperating on natural and cultural resources for sustainable growth in CENTRAL EUROPE

Priority axis 4: Cooperating on transport to better connect CENTRAL EUROPE

Current state of environment

In order to depict the current state of the environment within the programme area of CE 2020, the status quo of the defined environmental issues is considered. Regarding the current state of these environmental issues a different picture of the environment in the programme area emerges. The environmental issues such as “Water”, “Soil” or “Air and Climate” are exposed to various pressures (e.g. from transport, intensive agriculture) which have an adverse effect on these issues. The effects of climate change may, for instance, lead to a further increase in flood frequency and intensity which is already high compared to other territories in the EU. It can be positively highlighted that the number of NATURA 2000 sites within the programme area amounts to 11,347 sites which together represent 43.5 % of all NATURA 2000 sites in the EU. With regard to cultural and natural heritage as both are source of cultural and local identity as well as a driving force of regional development, it can be stated that the 100 heritage sites located within the CE 2020 programme area account for more than one quarter of all UNESCO sites within the EU (374). With view to energy resources, a positive development is also observable within the programme area as the share of renewable energy sources in gross final energy consumption has increased.

Methods of assessment

The methodological approach to assessing the environmental effects of the OP CE 2020 is supported by the identified guiding questions. These guiding questions are predominantly derived from environmental protection objectives which are based on different environmental policies existent at both the EU and international levels (e.g. UN-level). The possible environmental effects of the OP CE 2020 are considered for each environmental issue and cross-cutting theme. For the environmental assessment the most detailed level of programme information is used. Thus, the assessment of likely effects resulting from the OP CE 2020 is conducted at the level of the priority axes, their corresponding specific objectives and potential transnational actions.

Possible environmental effects of the OP CE 2020 Programme

The assessment at the programme level can only provide a general outline of possible environmental effects. This is due to the fact that more detailed information on the likely environmental effects will occur at the implementation phase of the projects. Moreover, due to the fact that the OP CE 2020 is an ETC programme it must be considered that its key focus is on the promotion of “soft factors” such as the building and increasing of capacities including exchange of knowledge and good practice between the participating Member States. **Thus, the possible environmental effects of the OP CE 2020 will primarily be of indirect nature**. Nevertheless, the promotion of “soft factors” forms the basis for further investment activities.

A short description of the main environmental effects on each Priority axis identified within the environmental assessment:

Priority axis 1: Building and increasing capacities and know-how in the innovation sector will likely have no significant effect on the environment. Amongst other things, however, the build-up of skills and competences in the field of eco- and social innovation as well of low-carbon solutions could affect almost all environmental issues in a positive way.

Priority axis 2: Building and increasing capacities for low carbon strategies in different fields such as improved energy efficiency in public infrastructure, strengthened use of renewable energy resources or enhanced low-carbon mobility will contribute to a reduction of emissions (CO_2, GHG) and thus to climate change mitigation. This has in particular a positive effect on the environmental issues “Air and Climate” but also for “Population and Human Health” and “Flora, Fauna and Biodiversity”. With regard to the usage of renewable energy resources single possible negative effects could likely occur on the several environmental issues.

Priority axis 3: Building and increasing capacities for the improvement of the sustainable use of natural and cultural resources will likely have a possible effect on all environmental issues. The promotion of integrated (environmental) approaches with focus on sustainable use will likely contribute to a reduction of external pressures and usage conflicts and thus contributes to protect the natural and cultural resources.

Priority axis 4: Building and increasing capacities for the improvement of the transports system with focus on the promotion of regional public transport and multimodal environment-friendly freight solutions will likely have possible positive effects in particular on “Air and Climate” as well as an “Population and Human Health”. Due to this focus possible environmental effects will likely not occur for most of the other environmental issues.

This figure provides an overview of the possible effects on the environmental issues resulting from the OP CE 2020.

	Environmental issues					
	Water	Soil	Air and Climate	Population and Human Health	Fauna, Flora and Bio-diversity	Cultural Heritage and Land-scape
Priority axis 1: Cooperating on innovation to make CENTRAL EUROPE more competitive						
Specific objective 1.1 To improve sustainable linkages among actors of the central European innovation systems for strengthening regional innovation capacity	o	o	o	o	o	o
Specific objective 1.2 To improve knowledge and skills for advancing economic and social innovation in central European regions	o/+	o/+	o/+	o/+	o/+	o
Priority axis 2: Cooperating on low carbon strategies in CENTRAL EUROPE						
Specific objective 2.1 To develop and implement solutions for increasing energy efficiency and renewable energy usage in public infrastructure	o	o	+	o/+	o/+	o
Specific objective 2.2 To improve territorially based energy planning strategies and policies supporting climate change mitigation	o/-	o/+	+	o/+	o/+/-	o/-
Specific objective 2.3 To improve capacities for mobility planning in functional urban areas to lower CO2 emissions	o	o	+	o/+	o/+	o
Priority axis 3: Cooperating on natural and cultural resources for sustainable growth in CENTRAL EUROPE						
Specific objective 3.1 To improve integrated environmental management capacities for the protection and sustainable use of natural heritage and resources	+	+	+	o/+	+	+
Specific objective 3.2 To improve capacities for the sustainable use of cultural heritage and resources	o	o	o	o/+	o	+
Specific objective 3.3 To improve environmental management of functional urban areas to make them more liveable places	+	+	+	+	+	+
Priority axis 4: Cooperating on transport to better connect CENTRAL EUROPE						
Specific objective 4.1 To improve planning and coordination of regional passenger transport systems for better connections to national and European transport networks	o	o	+	o/+	o	o
Specific objective 4.2 To improve coordination among freight transport stakeholders for in-creasing multimodal environment-friendly freight solutions	o/-	o	+	o/+	o	o

Legend for the assessment	
+	Possible occurrence of positive environmental effects
–	Possible occurrence of negative environmental effects
+/-	Possible occurrence of both positive and negative environmental effects
o	Likely no significant environmental effects
/	Assessment is not possible due to the limited availability of information

Monitoring measures

According to Article 10 of the SEA Directive EU/2001/42, possible significant environmental effects of the implementation of the Operational Programme CE 2020, identified within the existing environmental assessment, are to be monitored in order to identify at an early stage unforeseen adverse effects and to be able to undertake appropriate remedial action. Thus, monitoring measures must form part of and be implemented within the OP CE 2020. At the programme level, the monitoring of environmental effects should be incorporated into the monitoring framework of the programme. At the project level within the quality assessment of the project proposals possible effects on the environment should be considered as a horizontal issue taking into consideration also the results of the environmental assessment within this SEA report. Furthermore, the project applicants should describe within the application forms which possible environmental effects the project will likely have. During the implementation of the projects monitoring measures should also be implemented.

1. Introduction

The **draft environmental report** is one step in the Strategic Environmental Assessment which is to be implemented as part of the programming procedure of the transnational cooperation programme CENTRAL EUROPE 2020.

The Operational Programme CENTRAL EUROPE 2014-2020 (OP CE 2020) is a **European Territorial Cooperation Programme** which aims to promote cooperation between the regions of the CENTRAL EUROPE programming area. The OP CE 2020 supports transnational cooperation projects to encourage the **building and increasing of capacities including exchange of knowledge and good practices** between the participating Member States. This means that instead of promoting hard factors such as the building of mayor infrastructures the funding priority of the OP CE 2020 is mainly the promotion of soft factors as mentioned above. Consequently, the majority of the projects will have only **limited direct effects on the environment** due to the overall goal of the Operational Programme ("Cooperating beyond borders in central EUROPE to make our cities and regions better places to live and work"). In light of the limited budget of the CE Programme compared to the size of the overall territory only very limited direct effects on the environment can be expected. Nevertheless, it must be noted that the OP CE 2020 strives to contribute to the improvement of resource efficiency and sustainability as a horizontal issue and includes one priority axis (priority axis 3 "Cooperating on natural and cultural resources for sustainable growth in CENTRAL EUROPE") which specifically refers to environmental protection and management.

The Managing Authority/Joint Technical Secretariat (MA/JTS) coordinates the development process of the OP CE 2020. With regard to the participating Member States the programme area of the OP CE 2020 is presented in chapter 3.1 of this draft environmental report.

The **Strategic Environmental Assessment** is based on the SEA Directive EU/2001/42 and pursues the following objectives (according to Article 1 of this Directive):

- "to provide for a high level of protection of the environment and
- to contribute to the **integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development**, by ensuring that, in accordance with this Directive, an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment."

Accordingly, the SEA aims to assess the **possible effects of the OP CE 2020 on the environment** and is an integral part of the whole programming process. This means that the SEA must be carried out during the preparation of the programme in order to ensure directly the integration of feedback of the consultations of the public and environmental authorities into the CE 2020 Programme. The SEA process must be completed before the approval and submission to the Commission. The SEA must be considered as a continuous process which exhibits characteristic elements. As the following figure shows, the draft environmental report is part of **the second main step within this SEA process.**

Figure 1: Main process elements and outputs of the SEA process CE 2020
Source: blue | DSN, 2013

The **content of the draft environmental report** is based on Annex I of the SEA Directive. Thus, the report

- provides a **non-technical summary**;
- outlines the **programme's main objectives**;
- sets out briefly **the scope and methods of assessment**;
- points out the **environmental policy framework** at the international and EU level which is relevant for the assessment;
- elaborates on the **current environmental state** (including existing environmental problems) of the programme area;
- demonstrates the **likely evolution of the current environmental state** without the implementation of the programme;
- evaluates **possible effects on the environment resulting from the programme's implementation**;
- proposes **recommendations identified to prevent, reduce,** and **offset likely significant negative effects** on the environment which may occur as a consequence of the programme's implementation;
- recommends **monitoring measures.**

In this draft environmental report the **OP CE 2020, draft version 3.2 (November 2013)** forms the basis for the assessment of possible effects on the environment resulting from the implementation of this programme.

Following the completion of the draft environmental report, the environmental authorities and the public will be consulted and invited to provide their feedback on this draft environmental report. The feedback given by the environmental authorities of the Member States participating in the programme and the public will subsequently be integrated into the document and ultimately result in the final environmental report.

2. Outline of core contents of the Operational Programme CE 2020

This chapter outlines the core contents of the Operational Programme CE 2020 which is based on the OP draft version 3.2 (November 2013).

2.1 General framework of the Operational Programme CE 2020

The overall strategy of the Operational Programme CE 2020 is embedded in the superordinate objectives and strategies of the EU. Particularly relevant in this regard is the **EU 2020 Strategy** of **smart, sustainable and inclusive growth** with which the programme strategy corresponds. Moreover, the OP CE 2020 must be in line with the specifications set by the **EU Common Strategic Framework** for EU Cohesion Policy. Amongst other things this framework prescribes the following five objectives which must be considered within Transnational Cooperation Programmes such as CENTRAL EUROPE 2020:

- Cooperation in R&D and ICT,
- Joint management of natural resources,
- Shared infrastructure (e.g. waste, health, R&D and innovation),
- Network infrastructures (e.g. transport infrastructure planning, electricity infrastructure, environmentally-friendly modes of transport), and
- Security issues (e.g. crime and security cooperation).

Furthermore, the OP CE 2020 is based on the experiences made within the CENTRAL EUROPE 2007-2013 Programme which already showed close links to the EU 2020 strategy.

In the context mentioned above the CENTRAL EUROPE 2020 programme has specified the following **overall goal** (technical specification) for the funding period 2014-2020:

"Transnational cooperation in central Europe is the catalyst for implementing smart solutions answering to regional challenges in the field of innovation, low carbon economy, environment, culture and transport. It builds regional capacities following an integrated bottom-up approach involving and coordinating relevant actors from all governance levels."

In addition, the following **horizontal principles** are taken into consideration for the strategic orientation of the Operational Programme CE 2020:

- Sustainable development,
- Equal opportunities and non-discrimination, and
- Equality between men and women.

2.2 Key objectives and priorities of the Operational Programme CE 2020

In order to ensure a more impact-driven and result-orientated approach of transnational programmes, article 9 of the draft of the Common Strategic Regulation identifies eleven

thematic objectives in need of consideration for the forthcoming EU funding period from 2014 to 2020.

Of these eleven thematic objectives the following four have been chosen to define the focus of the Operational Programme CENTRAL EUROPE 2020:

- Strengthening research, technological development and innovation (CSF-TO 1)
- Supporting the shift towards a low-carbon economy in all sectors (CSF-TO 4)
- Protecting the environment and promoting resource efficiency (CSF- TO 6)
- Promoting sustainable transport and removing bottlenecks in key network Infrastructures (CSF-TO 7)

The selection of these objectives is based on the challenges and needs of the CE 2020 programme area[1] and contributes to the programme's overall goal.

On the basis of these selected thematic objectives four priority axes which cover the issues innovation, low-carbon economy, natural and cultural resources and transport have been developed. The four priority axes have been further specified to form seven investment priorities which were chosen on the basis of the investment priorities pre-defined for each thematic objective as well as ten programme specific objectives. Thus, the programme specific objectives substantiate the specific changes which result from the implementation of the OP CE 2020.

The following figure provides an overview of the selected priority axes, thematic objectives, investment priorities and specific objectives of the OP CE 2020.

[1] cf. Operational Programme CE 2020 (draft version 2.1.2, July 2013): chapter 1.1.2 Analysis of the socio-economic situation and the main challenges and needs of central Europe

Priority axis 1: Cooperating on innovation to make CENTRAL EUROPE more competitive	
Thematic objective	
1. Strengthening research, technological development and innovation	
Investment priority	
1b. Promoting business investment in innovation and research, and developing links and synergies between enterprises, R&D centres and higher education [...]	
Specific objectives	
1.1 To improve sustainable linkages among actors of the central European innovation systems for strengthening regional innovation capacity	
1.2 To improve knowledge and skills for advancing economic and social innovation in central European regions	
Priority axis 2: Cooperating on low carbon strategies in CENTRAL EUROPE	
Thematic objective	
4. Supporting the shift towards a low-carbon economy in all sectors	
Investment priority	
4c. Supporting energy efficiency and renewable energy use in public infrastructures, including in public buildings and in the housing sector	4e.Promoting low carbon strategies for all types of territories, i.p. urban areas, incl. the promotion of sustainable urban mobility and mitigation relevant adaptation measures
Specific objectives	
2.1 To develop and implement solutions for increasing energy efficiency and renewable energy usage in public infrastructure	2.2 To improve territorially based energy planning strategies and policies supporting climate change mitigation
	2.3 To improve capacities for mobility planning in functional urban areas to lower CO_2 emissions
Priority axis 3: Cooperating on natural and cultural resources for sustainable growth in CENTRAL EUROPE	
Thematic objective	
6. Protecting the environment and promoting resource efficiency	
Investment priority	
6c. Protecting, promoting and developing cultural and natural heritage	6e. Action to improve the urban environment, regeneration of brownfield sites and reduction of air pollution
Specific objectives	
3.1 To improve integrated environmental management capacities for the protection and sustainable use of natural heritage and resources	3.3 To improve environmental management of functional urban areas to make them more liveable places
3.2 To improve capacities for the sustainable use of cultural heritage and resources	
Priority axis 4: Cooperating on transport to better connect CENTRAL EUROPE	
Thematic objective	
7. Promoting sustainable transport and removing bottlenecks in key network infrastructures	
Investment priority	
7b. Enhancing regional mobility through connecting secondary and tertiary nodes to TEN-T infrastructure	7c. Developing environment-friendly and low-carbon transport systems including river and sea transport, ports and multimodal links
Specific objectives	
4.1 To improve planning and coordination of regional passenger transport systems for better connections to national and European transport networks	4.2 To improve coordination among freight transport stakeholders for increasing multimodal environment-friendly freight solutions

Figure 2: Programme strategy of the Operational Programme CENTRAL EUROPE 2020

Source: CENTRAL EUROPE 2013a

3. Scoping and methods of assessment

3.1 Scoping

In line with Article 5 (4) of the SEA Directive EU/2001/42 the following framework has been defined for the scoping process.

Relevant geographical area and forecast horizon

Geographically, the analysis of the current state of the environment, the description of development trends (zero-option) and the assessment of possible effects resulting from the implementation of the OP CE 2020 cover the area of Austria, Croatia, the Czech Republic, Hungary, Poland, the Slovak Republic and Slovenia as well as the relevant parts of Germany[2] and Italy[3] (cf. Figure 3). Broader environmental aspects such as the effects of global climate change are, however, considered in a wider spatial context.

Figure 3: Programme area of the Operational Programme CENTRAL EUROPE 2020

Source: CENTRAL EUROPE 2013b modified from blue | DSN

[2] Baden-Württemberg, Bayern, Berlin, Brandenburg, Mecklenburg- Vorpommern, Sachsen, Sachsen-Anhalt, Thüringen

[3] Piemonte, Valle d'Aosta/Vallée d'Aoste, Liguria, Lombardia, Provincia Autonoma Bolzano/Bozen, Provincia Autonoma Trento

With regard to the forecast horizon the timeframe considered for the environmental assessment not only corresponds to the funding period of the OP CE 2020 from 2014 to 2020, but also to the anticipated completion of funded projects scheduled for 2022.

Environmental issues, including indicators

Corresponding to the SEA Directive Annex I b, the environmental report must provide information on aspects relevant to the current environmental state and its likely evolution without the implementation of the CE 2020 programme (zero-option). The description of these relevant aspects forms the basis for assessing the possible environmental effects which may result from the OP CE 2020.

In line with both the requirements defined by the SEA Directive in Annex I f and further EU legislations, the following environmental issues with relevance to the future environmental assessment are considered within this environmental report:

- Water,
- Soil,
- Air and Climate,
- Population and Human Health,
- Fauna, Flora and Biodiversity, and
- Cultural Heritage and Landscape.

In addition, issues such as “Energy Resources”, “Mobility and Transport” as well as “Waste and Material Resources” are also taken into account. As they directly or indirectly affect the selected environmental issues, these aspects are considered to be cross-cutting themes. Given the cross-cutting character of these issues, the description of their current state and likely evolution has been integrated into the appropriate environmental issues noted above.

Furthermore, corresponding indicators are used as guidelines to characterise both the aspects relevant to the description of the current state of the environment and its likely evolution without implementation of the OP CE 2020 as well as for the assessment itself.

The selection process of the environmental issues and indicators is shown in an exemplary manner for the environmental issue “Soil” below (cf. Figure 4).

Figure 4: Selection process of environmental issues and indicators for the example "Soil"

Source: blue | DSN, 2013

Data basis and depth

Alongside other data sources, the data used in the environmental report is primarily based on statistical sources. Data used for the description of the current state of the environment and its likely evolution without implementation of the OP CE 2020 (cf. Chapter 5) is, for example, primarily based on the analysis of secondary data. To ensure both sufficient availability and comparability of data for each CE 2020 Member State, the secondary data used is, among other things, provided by the statistical office of the European Union, Eurostat. As a new Member State of the EU and also a new participating country of the CE 2020 data for Croatia is considered to the extent that it is available within official European statistics.

In light of the size and complexity of the study area, national (NUTS 0) as opposed to regional level (NUTS 2) data is used. Although only parts of Germany and Italy belong to the programme area national level data will also be used in these cases in order to ensure sufficient consistency.

3.2 Methods of assessment

Environmental protection objectives and guiding questions

In order to assess the possible effects resulting from the implementation of the OP CE 2020, central questions which serve as guidelines for the environmental assessment are identified for each environmental issue. These guiding questions are predominantly derived from environmental protection objectives which are based on different environmental policies existent at both the EU and international levels (e.g. UN-level) (cf. Chapter 4). The main basis for the identification of these environmental objectives and corresponding guiding questions is provided by superordinate environmental policies at the EU-level. Consequently, the choice of environmental policies is in some cases limited to superordinate frameworks as these imply supplementary provisions which regulate particular attributes of the selected environmental issues. Due to their specific regional focus, transnational protection agreements which refer only to parts of the programme area are not taken into account.

Identification of significant effects on the environment

The methodological approach to assessing the possible environmental effects of the Operational Programme CENTRAL EUROPE 2020 is guided by the following central question:

"Do the Specific objectives (and corresponding potential transnational actions) related to the four priority axes identified in the Operational Programme CE 2020 have a significantly positive or negative effect on the environmental issues in the programme area ?"

To answer this question the assessment is supported by the identified guiding questions and is carried out on the basis of the following 5-point-scale:

Legend for the assessment	
+	Possible occurrence of positive environmental effects
–	Possible occurrence of negative environmental effects
+/-	Possible occurrence of both positive and negative environmental effects
o	Likely no significant environmental effects
/	Assessment is not possible due to the limited availability of information

Figure 5: Legend for the assessment within the SEA process CE 2020
Source: blue | DSN, 2013

Furthermore, it should be noted that the assessment will be primarily based on a **qualitative approach**. Consequently, the environmental assessment focuses on the following: (1) the description of the anticipated advantages and disadvantages of the Operational Programme CENTRAL EUROPE 2020 (2), the possible positive or negative effects resulting from its implementation (3) the interdependencies between the possible effects identified.

3.3 Discussion of alternatives and measures to minimize possible adverse effects

The examination of appropriate alternatives is particularly necessary in cases where a significant effect on the defined environmental issues is anticipated. A description of the zero-option alternative is conducted within the environmental report and can be found in chapter 5. The zero-option scenario refers to the environmental status quo after full implementation of the projects funded in the previous period 2007-2013, as well as the anticipated evolution of the environment without implementation of the OP CE 2020.

Thus, the zero-option scenario is used as a basis to compare the possible effects resulting from the implementation of the CE 2020 programme.

Furthermore, the assessment of the various versions of the OP CE 2020 can be considered as a discussion of alternatives. Within this discursive process suggestions to amend the final draft of the Operational Programme CE 2020 with regard to possible environmental effects will be integrated.

4. Environmental policy framework

This chapter provides an overview of the environmental policy framework which has an effect on environmental protection within the CE 2020 programme area. For each of the defined environmental issues and cross-cutting themes it includes various environmental policies at the EU-level and beyond (e.g. UN-level). The choice of environmental policies is based on the relevance of their objectives to each selected environmental issue and cross-cutting-theme.

Besides the specific policies for the defined environmental issues and cross-cutting themes, superordinate strategies and programmes must also be considered. These policies provide an overall framework for environmental protection and include, for example, the "Proposal for the 7th EU Environmental Action Programme (EAP)" at the EU-level as well as the UN Environmental Programme (UNEP) at the international level. General protection objectives are included within these programmes. In addition, the headline targets of the long-term strategy Europe 2020 which relate to environmental aspects will also be considered.

According to these environmentally relevant policies, the OP CE 2020 must be in line with their objectives.

Therefore, the presentation of each defined environmental issue and cross-cutting theme is accompanied by the corresponding environmental policies and their qualitative or quantitative environmental objectives as well as by the resulting guiding questions which will be considered within the environmental assessment. A summary table is provided at the end of each respective section.

4.1 Water

The main objective for the environmental issue "Water" is the protection of the different water body types[4]. Indeed, the protection of water from various pressures is reflected in several regulations at the EU-level.

The **EU Water Framework Directive (2000/60/EC)** forms the key legislation for the environmental issue "Water". The Directive aims at different aspects including the prevention and reduction of water pollution, the promotion of sustainable water resource use and the contribution to mitigating the effects of floods and droughts. Furthermore, it calls for the improvement of the ecological and chemical state of water bodies in order to achieve a "good" overall water quality status by 2015. Therefore, both the regular analysis of water bodies as well as the establishment of continuously revised management plans for river basin districts is necessary.

Groundwater is the most sensitive and largest freshwater body within the EU territory. The **EU Groundwater Directive (2006/118/EC)**[5] supplements the Water Framework Directive

[4] The term "water bodies" includes inland surface waters, transitional waters, coastal waters and groundwater.

[5] The EU Water Framework Directive (2000/60/EC) is also complemented by several directives for human-related water use. The Drinking Water Directive (98/83/EC) specifies requirements for the quality of water

in that it includes quality standards or threshold values for the chemical state of groundwater. Furthermore, the Directive also refers to the reduction and prevention of indirect pollution which may, for example, result from the penetration of pollutants into the soil.

In addition, there are supplementary provisions that specify several of the protection objectives mentioned above. The **EU Nitrates Directive (91/676/EEC)** focuses on the protection from water pollution caused by nitrates from agricultural sources. According to the Directive this is to be achieved by means of water quality monitoring and the designation of vulnerable zones. Furthermore, compulsory action programmes and a voluntary code of good agricultural practice are designed to aid the reduction of pollution caused by nitrates. The "Nitrates' sister Directive", the **EU Urban Waste Water Directive (91/271/EEC)**, not only provides for the mitigation of negative effects resulting from discharges of urban waste water and industrial recharges, but also advocates for the better management of these waste waters. As specified by the Directive, a bi-annual status report must be published by the parties, discharges must be monitored regularly and both sensitive and less sensitive areas affected by treated waters must be listed.

Amongst other things, the sustainable use of water resources, i.e. a careful abstraction of water, is also directed by the **EU Thematic Strategy on the Sustainable Use of Natural Resources (COM (2005) 670)**.

The **EU Floods Directive (2007/60/EC)** requires the reduction of possible risks posed to human health, the environment, cultural heritage and economic activities as a result of flood events. In addition, the Directive proposes the establishment of flood risk management concepts by 2015. Moreover, the Directive also provides the corresponding flood risk maps and a preliminary assessment of risks for each river basin district identified by the Member States.

The following qualitative objectives and corresponding guiding questions can be derived from the environmental policies presented above:

Environmental policy	Qualitative environmental objective	Derived guiding question
EU Water Framework Directive (2000/60/EC) **EU Nitrates Directive (91/676/EEC)** **EU Urban Waste Water Directive (91/271/EEC)**	Prevention from / Reduction of water pollution (e.g. nitrates from agricultural sources or industrial recharges)	• Will the Specifc objective have an effect on the prevention from / reduction of water pollution?
EU Water Framework Directive (2000/60/EC)	Improvement of the ecological and chemical status of water bodies	• Will the Specifc objective have an effect on the improvement of the ecological and chemical status of water bodies?

intended for human consumption, The Bathing Water Directive (2006/7/EC by 2014) calls for clean and healthy bathing water to protect human health.

Environmental policy	Qualitative environmental objective	Derived guiding question
EU Water Framework Directive (2000/60/EC) **Thematic Strategy on the Sustainable Use of Natural Resources (COM (2005) 670)**	Promotion of sustainable use of water resources (e.g. by mitigating over-exploitation of freshwater resources in agriculture)	• Will the Specifc objective have an effect on the promotion of the sustainable use of water resources?
EU Water Framework Directive (2000/60/EC) **EU Floods Directive (2007/60/EC)**	Prevention from / Reduction of flood risks (e.g. by means of flood management such as river basin management and technical measures on flood protection)	• Will the Specific objective have an effect on the prevention from / reduction of flood risks (e.g. by managing flood risks)?
EU Urban Waste Water Directive (91/271/EEC)	Promotion of management of urban waste water	• Will the Specific objective have an effect on the promotion of management of urban waste water?

4.2 Soil

The **EU Soil Thematic Strategy (COM (2006) 231)** highlights the primary objectives for the protection of the environmental issue “Soil”. The strategy calls for soil protection by preventing and reducing contamination and degradation processes such as desertification, erosion or sealing. In addition, the preservation of the soil’s functionality and the sustainable use of soil resources, e.g. the responsible consumption of land, are outlined. The **Proposal for a Soil Framework Directive (COM (2006) 232)** draws on the main objectives noted above.

Furthermore, the **Thematic Strategy on the Sustainable Use of Natural Resources (COM (2005) 670)** also emphasises the balanced use of soil resources.

These regulations at the EU-level are in line with the general provisions of the **UN Convention to Combat Desertification 1994 (UNCCD)**. By addressing arid, semi-arid and dry sub-humid areas, in particular, the convention aims to prevent and reduce soil degradation and to promote a sustainable use of soil resources (e.g. by encouraging land management).

The following qualitative objectives and corresponding guiding questions can be derived from the environmental policies presented above:

Environmental policy	Qualitative environmental objective	Derived guiding question
Soil Thematic Strategy (COM (2006) 231) **Proposal for a Soil Framework Directive (COM (2006) 232)**	Prevention from / Reduction of soil contamination	• Will the Specifc objective have an effect on the prevention from / reduction of soil contamination?

Environmental policy	Qualitative environmental objective	Derived guiding question
Soil Thematic Strategy (COM (2006) 231) **Proposal for a Soil Framework Directive (COM (2006) 232)** **UN Convention to Combat Desertification**	Prevention from / Reduction of soil degradation (e.g. desertification, erosion, sealing)	• Will the Specifc objective have an effect on the prevention from / reduction of soil degradation?
Soil Thematic Strategy (COM (2006) 231)	Preservation of the soil functionality (e.g. in environmental, economic, social and cultural terms)	• Will the Specifc objective have an effect on the preservation of soil functions?
Soil Thematic Strategy (COM (2006) 231) **Proposal for a Soil Framework Directive (COM (2006) 232)** **Thematic Strategy on the Sustainable Use of Natural Resources (COM (2005) 670)** **UN Convention to Combat Desertification**	Promotion of sustainable use of soil resources (e.g. by means of sustainable land management)	• Will the Specifc objective have an effect on the promotion of the sustainable use of soil resources (e.g. by means of land management)?

4.3 Air and Climate

As for the environmental issue “Air and Climate”, pollution represents the key pressure, in particular with regard to the ambient air condition. In order to help curb climate change this pollution pressure needs to be reduced, so as to prevent acidification, eutrophication and ground-level ozone pollution. In recognition of this necessity, several regulations at the EU-level require the reduction of air pollution. First and foremost in this regard, the **EU Directive on ambient air quality and cleaner air for Europe (2008/50/EC)** must be considered, as it unites the Air Quality Framework Directive (96/62/EC) and three[6] or four of its sub-directives on particular air pollutants. The Directive stipulates the reduction of adverse effects on human health and the environment by improving the ambient air quality. For this purpose it proposes an assessment system for ambient air quality.

Additionally, the **Thematic Strategy on Air Pollution (COM (2005) 446)** specifies a number of long-term objectives for the emission reduction of certain air pollutants. In comparison to 2000 SO_2 emissions are to be reduced by 82 %, NOx emissions by 60 %, VOC (volatile organic compounds) emissions by 51 %, NH_3 by 27 % and primary particles 59% (PM 2.5 particles[7] emitted directly into the air) until 2020.

[6] First Daughter Directive to 96/62/EC: directive relating to the limitation of values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air (1999/30/EC); second Daughter Directive to 96/62/EC: directive relating to the limitation of values for benzene and carbon monoxide in ambient air (2000/69/EC); third Daughter Directive to 96/62/EC: directive relating to ozone in ambient air (2002/3/EC)

[7] PM 2.5 describes a certain category of particulate matter with an aerodynamic diameter of less than 2.5 µm.

As climate change is global in scope there are existing agreements at the international level. The **Kyoto Protocol** which relates to the United Nations Conference on Climate Change (UNFCCC) in 1997 is illustrative of this and plays a key role in combating climate change. The protocol sets internationally binding target values for GHG emissions within a specified time period, the first one of which ended in 2012. The follow-up protocol **Kyoto II** which was adopted at the UN Conference on Climate Change (Doha 2012), defines a second commitment period from 2013 to 2020. For this period the involved parties have agreed on a reduction of GHG emissions by at least 18 % below the emission values recorded in 1990.

In light of the Kyoto Protocol the EU adopted the **Strategy on Climate Change** called **"Winning the battle against global climate change" (COM (2005) 35)** which includes medium and long term strategies. First and foremost, it aims to reduce the temperature increase within the EU territory.

The following qualitative/quantitative objectives and corresponding guiding questions can be derived from the environmental policies presented above:

Environmental policy	Qualitative/quantitative environmental objective	Derived guiding question
EU Directive on ambient air quality and cleaner air for Europe (2008/50/EC) **Thematic Strategy on Air Pollution (COM (2005) 446)** **EU Strategy on Climate Change" Winning the battle against global climate change" (COM (2005) 35)**	Reduction of air pollution (e.g. to prevent acidification, eutrophication and ground-level ozone pollution)	• Will the Specifc objective have an effect on the reduction of air pollution?
Kyoto II on basis of UN Kyoto Protocol on Climate Change 1998 **EU Strategy on Climate Change" Winning the battle against global climate change" (COM (2005) 35)**	Protection of the climate (e.g. by mitigate global warming)	• Will the Specific objective have an effect on climate protection (e.g. by developing new technologies to limit the increase in temperature)?
Kyoto II on basis of UN Kyoto Protocol on Climate Change 1998	Reduction of the GHG emissions (min. 18 % below 1990 in the period 2013-2020)	• Will the Specific objective have an effect on the achievement of international emission targets (e.g. Kyoto Protocol)? • Will the Specific objective have an effect on the reduction of greenhouse gas emissions?

4.4 Population and Human Health

The prevention and reduction of adverse effects on "Population and Human Health" caused by threats related to the environment is a major protection objective at the EU-level and beyond. This objective is implied most strongly within the **EU Health for Growth**

Programme (COM (2011) 709) launched for the period 2014-2020, as it aims to prevent environmentally induced diseases and to promote good health.

Moreover, the **EU Health Strategy "Together for Health"** (2008-2013), which remains relevant for the next decade as part of the overall Strategy Europe 2020, expresses the need to protect human health by developing strategies aimed at tackling health risks and their determining factors, including the environment.

In preparation of the **7th EAP** the Council of the EU proposes that human health and the well-being of European citizens must be protected from environmental effects.

Placing particular focus on the health and well-being of children, the prevention and reduction of negative environmental effects on human health is also reflected in the **Parma Declaration on Environment and Health 2010** formulated by the World Health Organization (WHO).

The **EU Environmental Noise Directive (END) (2002/49/EC)** was adopted in recognition of the fact that the exposure of people to (permanent) noise poses a considerable health risk. Thus, the aim of this Directive is to prevent and reduce the negative effects of environmental noise on human well-being. For this reason, the Directive calls for the creation of strategic noise maps on the part of each Member State. Similarly, the WHO also considers the adverse affects noise pressures exert on human health. As specified in its 2009 **Night Noise Guidelines for Europe** specific threshold values necessary to ensure good health are recommended. According to the guidelines, the average exposure to night noise should not exceed the recommended limit of 40 decibel (dB) per year.

Furthermore, it must be noted that adverse effects caused by the other environmental issues defined within this report can also pose a threat to human health. An example would be the pollution of water bodies, as this may have a negative effect on the quality of drinking and bathing water and can thus, in turn, be harmful to human health. Similarly, transport-related emissions which may affect the ambient air condition (e.g. particulate matter) can also have a negative effect on human well-being.

The following qualitative objectives and corresponding guiding questions can be derived from the environmental policies presented above:

Environmental policy	Qualitative environmental objective	Derived guiding question
EU Environmental Noise Directive (END) (2002/49/EC) **WHO Night Noise Guidelines for Europe (2009)**	Prevention from / Reduction of environmental noise exposure	• Will the Specific objective have an effect on the prevention from / reduction of the exposure by environmental noise?

EU Health for Growth Programme (2014-2020) (COM (2011) 709) **EU Health Strategy "Together for Health" (2008-2013)**[8] **WHO Parma Declaration on Environment and Health2010** **7th Environmental Action Programme**	Prevention / Reduction of diseases / negative health effects caused by environment-related threats	• Will the Specific objective have an effect on the prevention of diseases / reduction of negative effects caused by environment-related threats?

4.5 Fauna, Flora and Biodiversity

Biodiversity describes the richness of living organisms and their respective environment. It includes both the diversity within and between species as well as the diversity of entire ecosystems. The uniqueness of this natural diversity is to be protected.

Reducing the rate of biodiversity loss and ecosystem services is the main objective of the **EU 2020 Biodiversity Strategy**. In addition, green infrastructure[9] is also to be promoted. This strategy is in line with the international commitment of the **UN Convention on Biological Diversity** (Nagoya 2010).

The protection of endangered species is another protection objective. The **IUCN Global Species Programme** plays an important role in this regard, as it provides the “Red List of Threatened Species”. In order to help protect endangered species the “Red List” assesses the conservation status of various species at the global level and highlights the degree to which they are endangered and threatened by extinction.

The **EU Habitats Directive (92/43/EEC)** generally aims to protect and promote biodiversity. Particular focus is placed hereby on both the protection of endangered species (animals and plants) as well as on the protection and promotion of natural habitats. Together with the **EU Birds Directive (2009/147/EC)** which was adopted accordingly to protect wild birds and their natural habitats, the two Directives form the vital basis for nature protection within the EU. Most notably, the Habitats Directive has resulted in the establishment of the EU-wide network of protected areas NATURA 2000 which aims to promote and assure the long-term protection of threated species and habitats.

The following qualitative objectives and corresponding guiding questions can be derived from the environmental policies presented above:

[8] The European Commission evaluated the EU Health Strategy in 2011. The evaluation recognised that the strategy acts as a reference for actions taken at national and EU levels and confirmed that the principles and objectives identified in 2007 remain valid for the next decade in the context of Europe 2020 (European Commission 2013e)

[9] Green infrastructure is characterized by its multi-functionality. It includes natural and semi-natural areas, features and green spaces in different spatial areas e.g. rural and urban areas. Green Infrastructure helps to conserve and create valuable landscape features which, in turn, contribute to the provision of ecosystem services and biodiversity (European Comission 2013a).

Environmental policy	Qualitative environmental objective	Derived guiding question
EU Habitats Directive (92/43/EEC) **EU 2020 Biodiversity Strategy** **UN Convention on Biological Diversity**	Protection and promotion of biological diversity	• Will the Specific objective have an effect on the protection and promotion of biological diversity?
EU Birds Directive (2009/147/EC) **EU Habitats Directive (92/43/EEC)** **IUCN Global Species Programme**	Protection of endangered species (animals and plants)	• Will the Specific objective have an effect on the protection of endangered species (animals and plants)?

Environmental policy	Qualitative environmental objective	Derived guiding question
EU Birds Directive (2009/147/EC) **EU Habitats Directive (92/43/EEC)**	Protection and promotion of natural habitats (e.g. within the NATURA 2000 network)	• Will the Specific objective have an effect on the protection and promotion of natural habitats (e.g. by designating NATURA 2000 or other protected areas)?
EU 2020 Biodiversity Strategy	Protection of ecosystems	• Will the Specific objective have an effect on the protection of ecosystems? • Will the Specific objective have an effect on the strengthening of the concept of ecosystem services in other relevant sectors? • Will the Specific objective have an effect on the introduction of the concept of ecological connectivity to other relevant sectors (transport, settlement, spatial planning)?
EU 2020 Biodiversity Strategy	Promotion of green infrastructure	• Will the Specific objective have an effect on the promotion green infrastructure?

4.6 Cultural Heritage and Landscape

The UNESCO **World Cultural and Natural Heritage Convention 1972** is today still the main policy for the protection and preservation of cultural and natural heritage at the international level. The convention initiated the World Heritage Programme which promotes the conservation of several tangible and intangible significant sites. At present, 962 World Heritage Properties (745 cultural, 188 natural and 29 mixed properties) are listed, of which 48 % are located in Europe and Northern America[10].

At the **European Landscape Convention 2000** the parties agreed, above all, on the protection and preservation of cultural and natural landscapes. Furthermore, the convention not only encouraged the sustainable management and planning of European landscapes, but also advocated for heightened cooperation between the EU Member States with regard to landscape related issues.

Moreover, the **EU Thematic Strategy on the Urban Environment (COM (2005) 718)** takes up issues ranging from urban sprawl to intensified soil sealing, as both can effect the appearance of urban landscapes and their surrounding areas.

[10] UNESCO 2013

The following qualitative objectives and corresponding guiding questions can be derived from the environmental policies presented above:

Environmental policy	Qualitative environmental objective	Derived guiding questions
UNESCO World Cultural and Natural Heritage Convention 1972	Protection and preservation of cultural heritage	• Will the Specific objective have an effect on the protection and preservation of cultural heritage?
European Landscape Convention 2000 **EU Thematic Strategy on the Urban Environment (COM (2005) 718)**	Protection and preservation as well as sustainable management and planning of European cultural and natural landscape	• Will the Specific objective have an effect on the protection and preservation of cultural and natural landscapes? • Will the Specific objective have an effect on the promotion of sustainable management and planning of cultural and natural landscapes? • Will the Specific objective have an effect on the integration of renewable energy use and protection of cultural landscapes?

4.7 Cross-cutting themes

“Waste and Material Resources”, “Energy Resources” as well as “Mobility and Transport” are identified as cross-cutting fields of action. Due to their influence on several of the defined environmental issues, these themes are included in specific EU policies. Thus, a clear assignment of these cross cutting themes to the defined environmental issues is difficult.

Waste and Material Ressources

Regarding the cross-cutting theme “Waste and Material Resources” regulations are primarily based on the **EU Waste Framework Directive (2008/98/EC)**. This Directive aims to reduce the amount of generated waste and to promote sustainable waste management. Thus, the EU Waste Framework Directive contributes to the protection of the environment and human health from adverse effects on the one hand and to the sustainable use of material resources (as waste is considered a secondary raw material) on the other. The objective to promote the sustainable use of these material resources is also reflected in the **EU Thematic Strategy on the Sustainable Use of Natural Resources** and the **7th EAP**.

The disposal of waste primarily concerns the environmental issues “Water” and “Soil”, as discharged harmful substances such as chemicals and pesticides pollute water and soil bodies. Furthermore, landfills take up large areas of land. The environmental issue “Air and Climate” is affected by pollutants which are released directly into the atmosphere and include CO_2 and CH_4. Ultimately, this has a negative effect on human health as well as on the flora and fauna.

The following qualitative objectives and corresponding guiding questions can be derived from the cross-cutting theme presented above:

Environmental policy	Qualitative environmental objective	Derived guiding question
EU Waste Framework Directive (2008/98/EC)	Reduction of the volume of waste	• Will the Specific objective have an effect on the reduction of the waste volume?
EU Waste Framework Directive (2008/98/EC)	Promotion of sustainable waste management to protect human health and the environment and to use waste as a resource (e.g. by recycling)	• Will the Specific objective have an effect on the promotion of sustainable waste management (e.g. by recycling)?
Thematic Strategy on the Sustainable Use of Natural Resources (COM (2005) 670) **7th Environmental Action Programme**	Promoting of sustainable use of material resources	• Will the Specific objective have an effect on the promotion of sustainable use of material resources?

Energy Resources

The newly adopted **EU Energy Efficiency Directive (2012/27/EU)** must be considered with the EU 2020 Strategy in mind. In line with one of the headline targets specified in this strategy the Directive aims to improve energy efficiency by achieving 20 % primary energy savings until 2020. As high energy efficiency is achieved by lower carbon levels, another objective is to reduce carbon dioxide emissions as one of the major GHGs by 20 % until 2020. The **EU Energy Efficiency Action Plan 2011** corresponds to the Directive, as it aims to reduce primary energy consumption and to implement low carbon systems. In preparation of the **7th EAP** energy efficiency is reflected in the second thematic priority objective “Boost sustainable resource-efficient low-carbon growth”.

Furthermore, the Energy Efficiency Directive is consistent with the **EU Renewable Energy Directive (RED) (2009/28/EC)** which promotes an increase in the share of renewable energy sources. According to the EU 2020 Strategy, a share of 20 % of renewables is to be achieved by 2020.

Measures of energy generation and consumption influence the environmental issue “Air and Climate” most intensely, as the related emissions are released into the atmosphere where they contribute to the Greenhouse effect. Depending on how energy resources are used and energy is generated other environmental issues such as “Water”, “Soil”, “Cultural and Natural Heritage and Landscape” and “Fauna, Flora and Biodiversity” are also affected. Possible effects include the exploitation of water for cooling purposes, extensive land take and soil degradation as well as the fragmentation of landscapes and ecosystems.

The following qualitative/quantitative objectives and corresponding guiding questions can be derived from the cross-cutting theme presented above:

Environmental policy	Qualitative/quantitative environmental objective	Derived guiding questions
Energy Efficiency Directive (2012/27/EU) **Energy Efficiency Action Plan (2011)** **7th Environmental Action Programme**	Improvement of energy efficiency (by 20 % by 2020)	• Will the Specific objective have an effect on the improvement of energy efficiency?
Energy Efficiency Directive (2012/27/EU)* **EU Renewable Energy Directive (RED) (2009/28/EC)** **EU Climate and Energy Package 2020**	Increase of use of renewables (20 % of renewable energy by 2020)	• Will the Specific objective have an effect on the increase of the use of renewable energy?
Energy Efficiency Directive (2012/27/EU) **Energy Efficiency Action Plan (2011)** **EU Climate and Energy Package 2020**	Reduction of GHG emissions (by 20 % by 2020)	• Will the Specific objective have an effect on the reduction of GHG emissions?

Mobility and Transport

According to the **EU White Paper 2011 – Roadmap to a Single European Transport Area** sustainable mobility and transport systems must be promoted and transport-related carbon emissions reduced. Accordingly, the White Paper aims to ensure that 50 % of medium distance intercity passenger and freight journeys be shifted from road to rail and waterborne transport by 2050. Moreover, the use of sustainable low carbon fuels in aviation and the reduction of shipping emissions are to be promoted. Taken together, these measures intend to achieve a reduction of transport-related carbon emissions by 60 % until 2050. Given that urban mobility accounts for a large share of transport-related pollution (e.g. 40 % of all CO_2 emissions in road transportation), the significance of urban mobility has been an intensely discussed issue since 2007. On the basis of the Green Paper the **EU Action Plan on Urban Mobility (COM (2009) 490)**[11] was prepared. The Action Plan proposes 20 initiatives aimed at encouraging sustainable urban mobility and includes campaigns for the promotion of sustainable mobility behaviour and intelligent transport systems (ITS).

“Mobility and Transport” is viewed as a cross-cutting theme, as the different modes of transport (road, rail, air, maritime and inland waterways) affect the corresponding environmental issues “Soil”, “Air and Climate” and “Water”. This is particular true with regard to pollution, as carbon dioxide is, for example, one of the major GHG transport-related emissions and contributes significantly to climate change. Furthermore, the construction of transportation infrastructure can lead to the fragmentation of landscapes and ecosystems.

[11] In 2012, the European Commission initiated a consultation process to conduct a review of the implementation of the Action Plan and to assess whether further actions are needed.

In addition, higher levels of mobility also effect human health, as people are increasingly exposed to emissions such as particulate matter and transport-related noise.

The following qualitative/quantitative objectives and corresponding guiding questions can be derived from the cross-cutting theme presented above:

Environmental policy	Qualitative/quantitative environmental objective	Derived guiding question
EU White paper 2011 - Roadmap to a Single European Transport Area **EU Action Plan on Urban Mobility (COM (2009) 490)**	Promotion of sustainable mobility and transport systems (e. g. by a shift of medium distance intercity passenger and freight from road to rail and waterborne modes of transport)	• Will the Specific objective have an effect on the promotion of sustainable mobility and transport systems?
EU White paper 2011 - Roadmap to a Single European Transport Area	Reduction of carbon emissions in transport (by 60 % by 2050) (e. g. by increasing the use of sustainable fuels in aviation)	• Will the Specific objective have an effect on the reduction of emissions related to transport (aviation, road traffic, shipping etc.)?

5. Current state of the environment and its likely evolution without the implementation of the OP CE 2020

This chapter provides a description of the aspects relevant to the current state of the environment within the programme area of CE 2020 and includes its likely evolution without the implementation of the OP CE 2020 (the so-called zero-option scenario). The description of the current state of the environment includes an overview of the relevant environmental characteristics which are likely to be affected as well as of existing environmental problems within the CE 2020 programme area.

5.1 Methodology

In order to depict the current state of the environment within the programme area of CE 2020, the status quo of the defined environmental issues is considered. The main characteristics of these environmental issues are described using corresponding indicators. The environmental issues and their corresponding indicators were identified on the basis of the legal framework provided by the European Union (cf. Chapter 3.1) and have been revised as part of the scoping consultation process.

Alongside other sources, the description is primarily based on data provided by Eurostat as well as on data published by the EEA and the European Commission. Further secondary sources were gathered during detailed and systematic desk research. Published by the European Environmental Agency, for example, “The European Environment - State and Outlook 2010” (EEA 2010) provides important background information in this context.

With regard to the depth of data used, the current state of the environment is described as outlined in chapter 3.1. This is particularly important to note for Italy and Germany, as only parts of these countries are participating in the CE 2020 Programme. The same goes for Croatia, as the country only recently joined the EU and is thus a new member of CE 2020.

The zero-option scenario describes the anticipated development of environmental factors in the programme area without the implementation of the Operational Programme CENTRAL EUROPE 2020. Thus, it forms the baseline for the subsequent assessment of the potential effect of OP CE 2020 on the environment. Based on data providing an appropriate forecast horizon of up until 2020 (cf. Chapter 3), the likely evolution of the environment is estimated on a qualitative basis for each of the environmental issues. Given the limited availability of trend data, however, it must be noted that a description of the future development of the CE 2020 programme area is difficult. Furthermore, the general trends identified for the whole CE 2020 programme area are difficult to isolate and break down for individual sub-regions.

The cross-cutting themes and their corresponding indicators are assigned to the environmental issues that are affected most significantly by each respective theme. Accordingly, the theme “Waste and Material Resources” is assigned to “Soil” and the themes “Energy Resources” and “Mobility and Transport” to the environmental issue “Air and Climate”.

5.2 Water

As the basis of all organic life and health, high water quality is vital for both the population and ecosystems. Thus, the achievement and maintenance of high ecological standards for all European water bodies is of central importance (cf. Chapter 4.1). As European waters are, however, often affected by pollution, water scarcity and floods a set of widely acknowledged indicators of "water quality" is used to describe the current state of the environmental issue "Water" within the CE 2020 programme area. Further indicators which refer to water resource use and flood-related risks are considered in the following.

Generally speaking, water quality is affected by organic and inorganic pollution caused by agriculture, industry and private households (e.g. fertilizer, pesticides and heavy metals). With regard to pollution pressures existent within the CE 2020 programme area, more than 50 % of the water bodies in most Member States are affected quite strongly by pollution. Austria and parts of Italy represent an exception, however, as less than 30 % of water bodies are affected by pollution pressures in these two Member States (cf. Figure 6)

Figure 6: Proportion of classified surface water bodies in different RBDs[12] affected by pollution pressures (2005-2009)

Source: European Environmental Agency 2012e

As the pollution pressures mentioned above have an effect on the water quality, the ecological status of water bodies indicates whether the water quality can be considered good or poor. As shown in an exemplary manner for rivers and lakes in Figure 6, a large proportion of water bodies in the CE 2020 programme area is characterised by a poor ecological

[12] Reference Data Base

status or potential[13] (cf. Figure 7). Particularly affected in this regard are water bodies in Poland, the Czech Republic and Hungary as well as also in the participating parts of Germany participating in the CE Programme. Less affected on the other hand are water bodies in the Slovak Republic, Slovenia and, to some extent, also in the participating parts of Italy.

Figure 7: Proportion of classified surface water bodies in different RBDs[14] characterised by less than good ecological status or potential (2005-2009)

Source: European Environmental Agency 2012d

The Water Exploitation Index (WEI) is an indicator which represents the level of water stress, i.e. how sustainably water resources are used. Figure 8 shows that the majority of water resources within the CE 2020 programme area are not or only slightly stressed as a result of unsustainable water use. An exception to this are, however, the parts of Italy and the Czech Republic which belong to the OP CE 2020 area, as some regions display an index value of 21 to 40 % and thus imply that an overexploitation of water resources is taking place. In broad comparison to the southern parts of the EU, however, the Member States of the OP CE 2020 are not greatly affected by this problem.

[13] Amongst other things, the ecological status or potential of water bodies is influenced by the nutrient input which has an effect on organisms living in the water.

[14] Reference Data Base

Figure 8: Water Exploitation Index in the smallest available data disaggregation

Source: European Environmental Agency 2012i

The occurrence of flood events is also an indicator that characterises the environmental issue "Water". Although to differing degrees, all parts of the CE 2020 programme area were affected by flood events in the period from 1998 to 2009 (cf. Figure 9). With as many as eight flood events on record, Hungary and the Slovak Republic are characterised by the highest flood frequency in this time period. Similarly, Austria, Croatia and the Czech Republic as well as the southern parts of Germany and the southern part of Poland also show an increase in the number of flood events.

Figure 9: Occurrence of major floods in Europe (1998-2009)
Source: European Environmental Agency 2012f

Zero-option scenario

Given the fact that the protection and control of water bodies is subject to several EU legislations, a positive development within the CE 2020 programme area will most likely be promoted. This is particularly true with regard to water quality. Already initiated aspects include processes geared towards the mitigation of pressures which effect the ecological status and relate, for example, to the improvement of waste water treatment and the reduction of nitrate pollution. Thus, the improvement of water quality is making steady progress. With regard to the corresponding regulation a decrease in the overexploitation of water resources can even be expected without implementation of the OP CE 2020. As for climate change and its effects on the environment, an increase in precipitation can be assumed. Accordingly, regions where flood events occur regularly are likely to be affected by a further increase in flood frequency and intensity.

5.3 Soil

Given that the environmental issue “Soil” and its diverse functions provide the basis for humans and their economic activities, the key objective is to reduce and prevent pressures on this vital resource (cf. Chapter 4.2). Adverse effects on soil can, amongst other issues, stem from degradation processes such as erosion, landslides or sealing. Moreover, soil functions are often affected by contamination caused by industrial or commercial activities as well as by waste disposal. Thus, the cross-cutting theme “Waste and Material Resources” is considered in terms of how waste is treated. The description of the current state of soil within the programme area of CE 2020 is based on indicators which correspond to the threats mentioned above.

Heavy metals are one of the main contaminants found in soil. Using the example of lead (Pb) Figure 10 shows that increasing topsoil concentrations of this heavy metal are pri-

marily located in the Southern parts of the CE 2020 programme area. Particularly high concentrations of lead are observable in Croatia, Austria and Slovenia as well as in the Eastern part of Italy and the Southern part of Germany belonging to the OP CE 2020. In contrast, the concentration of lead in topsoil is relatively low in Poland and also in most parts of Hungary. Isolated spots of extremely high lead concentrations can be identified in the participating parts of Italy, Austria, Poland and the Slovak Republic where a lead enrichment factor greater than 5 is observable.

Figure 10: Soil contamination by heavy metals in agricultural soils and pasture lands (2006)

Source: European Environmental Agency 2012g

Degradation processes of soil erosion are primarily induced by water and wind. With regard to erosion by water, the whole CE 2020 programme area is only slightly affected (cf. Figure 11). Whereas in most parts of the programme area the erosion rate induced by water is lower than 5 tonnes/ha/year, isolated areas where soil erosion induced by water has increased can be identified in the participating parts of Italy, Austria and Slovenia.

Figure 11: Estimated soil erosion by water in Europe (2006)

Source: European Environmental Agency 2012h

With regard to soil erosion by wind a similar situation is observable. Particularly noticeable in this case is, however, the strong effect wind has on the coastal areas of the programme area which include Croatia, Poland and the participating parts of Germany.[15]

As for susceptibility to landslides, the regions of the CE 2020 programme area characterised by mountain ranges such as the Alps and the Carpathians are particularly affected. Thus, a very high landslide risk can be identified for Austria, Slovenia and the participating parts of Italy.[16]

With respect to soil degradation as a result of sealing, urban agglomerations such as the capital regions of the Member States show a particularly high degree of surface sealing. This is due to the fact that these areas are commonly characterised by extensive sealing processes.[17]

Regarding the cross-cutting theme “Waste and Material Resources” it must be noted that municipal waste in Europe is primarily treated by land filling (cf. Figure 12). Whereas the landfill share of total waste is particularly high in Croatia, the Czech Republic and the Slovak Republic waste in Germany and Austria is rarely disposed of in land-fill sites. Instead, Germany is characterised by the highest share of waste recycling and Austria the highest share of waste composting.

[15] European Environmental Agency 2012j

[16] Institute for Environment and Sustainability 2013

[17] European Environmental Agency 2012k

Member State of the OP CE 2020	Treatment of waste in %			
	Landfilled	Incinerated	Recycled	Composted
Czech Republic	65	18	15	2
Germany	1	37	45	17
Italy	49	17	21	13
Hungary	67	11	17	5
Austria	3	35	28	34
Poland	71	1	11	17
Slovenia	58	2	34	6
Slovak Republic	78	11	5	6
Croatia	92	0	8	1

Figure 12: Municipal waste treatment within the programme area of CE 2020 (2011)

Source: Eurostat 2013a

Zero-option scenario

Soil resources within the CE 2020 programme area are exposed to several risks. Whereas contamination tends to affect soil most strongly, erosion pressures are likely to have only a limited effect on soil resources in the CE 2020 programme area in the future. With regard to landslides, further effects on regions in which landslides are already quite common can be expected. Given that extensive soil sealing activities are primarily concentrated in urban agglomerations, it can be assumed that this trend will continue. Although the environmental issue "Soil" is threatened by a number of factors, it is still insufficiently considered within specific regulations.

The cross-cutting theme "Waste and Material Resources" plays a special role. In light of specific regulations for waste treatment existent at the EU-level, further efforts geared towards both the reduction of land filling as the main form of waste treatment and the encouragement of recycling can be expected within the CE 2020 programme area.

5.4 Air and Climate

Given that clean air is vital for both human health and the environment, the EU continually strives to improve the air quality (cf. Chapter 4.3). As a result of large-scale industrial and energy production as well as increasing levels of traffic and fossil fuel combustion, however, human activities are effecting the ambient air quality and thus inducing adverse effects on both the environment and the well-being of the population. Amongst others, the main pollutants include sulphur dioxide, carbon monoxide and benzene. Widely acknowledged as the key cause of the green house effect, so-called greenhouse gases (GHG) such as carbon dioxide, ozone, methane and nitrous oxide also play a role. Taken together, they not only exert a strong effect on climate conditions, but also contribute greatly to global warming.

For the characterisation of the environmental issue "Air and Climate" the indicators considered primarily relate to the emission values of several air pollutants.

Given that energy production and traffic are identified as two main sources of pollution, the emission-related characteristics of the cross-cutting themes “Energy Resources” and “Mobility and Transport” are analysed.

Within the CE 2020 programme area, the air pollution caused by sulphur dioxide[18] is used as an exemplary indicator for the ambient air quality. As shown in Figure 13 the majority of the Member States within the CE 2020 programme area do not exhibit extremely high sulphur dioxide concentrations. Having said this, isolated spots in the Czech Republic, the Slovak Republic, Hungary, and Austria as well as in the participating parts of Italy exhibit slightly higher concentration levels. Regarding some parts of Poland (in particular towards the Southern border), these parts indicate a relative high sulphur diooxid concentrations.

Figure 13: Annual mean SO_2 concentrations (µg/m³) (2010)

Source: European Environmental Agency 2012a

Looking at the development of GHG emissions within the CE 2020 programme area, a decrease in GHG emission values since 2000 is observable for all Member States except Poland, Austria and Slovenia (cf. Figure 14). With regard to achieving the Kyoto targets specified for the period 2008-2012, the majority of CE 2020 Member States have not exceeded the defined threshold values (based on the GHG emissions recorded for 2010). Only Austria, Italy and Slovenia failed to comply with the defined Kyoto targets for the period 2008-2012.

[18] Amongst others, sulphur dioxide is produced by the energy sector. It contributes to acid rain which has a negative effect on the environment and the well-being of humans.

Member State of the OP CE 2020	2000	2005	2010	Kyoto targets 2008-2012
Czech Republic	75	75	72	92.0
Germany	84	81	76	79.0
Italy	107	111	97	93.5
Hungary	67	69	59	94.0
Austria	102	118	107	87.0
Poland	68	69	71	94.0
Slovenia	92	100	96	92.0
Slovak Republic	68	71	64	92.0
Croatia	n.a.	n.a.	n.a.	n.a.

Figure 14: Total greenhouse gas emissions 2000-2010 compared with the Kyoto targets 2008-2012 (Kyoto base year = 100)

Source: Eurostat 2013b

With regard to the cross-cutting theme “Energy Resources”, energy consumption levels are less relevant to drawing conclusions on emissions released into the ambient air. More suitable in this case is the share of energy consumption attributable to the various energy sources. As renewable energies are considered a more efficient and low GHG emission energy source, the share of renewable energies in the gross final energy consumption is presented in the following. As shown in Figure 15 all CE 2020 Member States achieved an increase in the share of renewable energies in the gross final energy consumption from 2005 to 2011. Particularly high in this regard is the share of renewable energies in Austria (30.9 %), Slovenia (18.8 %) and Croatia (15.7 %) in 2011.

Member State of the OP CE 2020	2005	2008	2011
Czech Republic	6.1	7.6	9.4
Germany	6.0	8.4	12.3
Italy	5.1	6.9	11.5
Hungary	4.5	6.5	9.1
Austria	23.8	28.3	30.9
Poland	7.0	7.9	10.4
Slovenia	16.0	15.0	18.8
Slovak Republic	6.6	8.1	9.7
Croatia	14.1	12.2	15.7

Figure 15: Share of renewable energies in gross final energy consumption in % (2005-2011)

Source: Eurostat n.d. b

With regard to the cross-cutting theme “Mobility and Tansport” conclusions on transport-related emissions can be derived, for example, from the indicator “modal split”. A differen-

tiation must hereby be made, however, between “freight transport” and “passenger transport”.

With view to the modal split of inland freight transport Figure 16 shows that inland freight transport within the CE 2020 programme area is clearly dominated by road transportation, followed at some distance by railway transportation. With the exception of Germany and Croatia, inland waterways play a less significant role. Apart from Austria and Germany, where the significance of rail transport has grown, the share of freight transport by road has increased in the CE 2020 Member States from 2000 to 2010. In Poland and the Slovak Republic, in particular, the share of road transportation has increased by almost 25 %. This high proportion of freight transport conducted by road results in increasing CO_2 emissions which have an adverse effect on both the climate and air quality.

Member State of the OP CE 2020	2000			2010		
	Roads	Rail-ways	Inland water-ways	Roads	Rail-ways	Inland-water-ways
Czech Republic	68.0	31.9	2,6	79.0	21.0	0.1
Germany	65.3	19.2	15.5	64.9	22.2	12.9
Italy	89.0	11.0	0.1	90.4	9.6	0.1
Hungary	68.1	28.8	3.1	75.1	19.6	5.3
Austria	64.8	30.6	4.5	56.3	39.0	4.7
Poland	57.4	42.6	0.9	80.6	19.4	0.1
Slovenia	71.9	28.1	n.a.	82.3	17.7	n.a.
Slovak Republic	53.0	41.7	5.3	74.8	22.0	3.2
Croatia	n.a.	n.a.	n.a.	71.2	21.2	7.6

Figure 16: Modal split in inland freight transport (% of total inland tkm) 2000 and 2010

Source: Eurostat 2012a

Figure 17 provides an overview of the modal split in inland passenger transport for the CE 2020 Member States. As shown in the table below the majority of passengers travel by car followed by buses, railways, trams and metros. As shown for 2000 and 2010, the share of passenger cars and buses remains relatively stable, with the former exhibiting a slight increase. With the exception of Austria, Croatia and Germany, the relevance of railways, trams and metros as modes of transport has decreased from 2000 to 2010.

Member State of the OP CE 2020	2000			2010		
	Passen-ger cars	Buses	Railways, Trams and Met-ros	Pas-senger cars	Buses	Railways, Trams and Met-ros
Czech Republic	73.1	18.6	8.3	73.7	18.7	7.6
Germany	85.2	7.1	7.7	85.9	6.1	8.0
Italy	83.5	10.8	5.7	82.3	12.2	5.5
Hungary	62.1	25.0	12.9	63.1	25.1	11.8
Austria	79.2	11.0	9.8	78.2	10.6	11.2
Poland	72.8	15.4	11.7	88.4	6.4	5.2
Slovenia	82.9	14.3	2.9	86.8	10.8	2.5
Slovak Republic	64.4	27.8	7.7	77.8	15.5	6.7
Croatia	81.4	13.6	5.1	85.4	9.0	5.6

Figure 17: Modal split in passenger transport (% in total inland passenger-km) 2000 and 2010

Source: Eurostat 2012b

Zero-option scenario

Ensuring a clean ambient air condition and mitigating negative climatic effects are one of the central European topics. Existing efforts aimed at reducing the concentration of air pollutants such as SO_2 already exhibit positive results and render higher pollution concentrations somewhat rare. For this reason, the continuation of this positive development can be deemed likely, even without implementation of the OP CE 2020. Whilst a similarly positive trend is also observable with regard to the reduction of GHG emissions, potential for further reductions still exist. With regard to “Energy Resources”, the share of renewable energies in the gross final energy consumption has increased which has also had a positive effect on the pollution levels of ambient air. In light of recent EU legislation with explicit links to renewable energy sources, further attempts to promote renewable energies alongside the CE 2020 can be expected. Given that transportation via road dominates the transport sector, the development of sustainable forms of transport will most likely require further promotion, even in the absence of the OP CE 2020.

5.5 Population and Human Health

Humans are constantly exposed to environmental influences. Due to this close relationship, environmental factors can have an adverse effect on human health and well-being in multiple ways. Particular risk factors in this regard relate to (permanent) noise pollution and ambient air pollution caused, for example, by particulate matter or ozone. In recognition of these risks, various regulations at the EU and international level aim to improve human health and well-being by creating cleaner and healthier environmental conditions (cf. Chapter 4.4).

With regard to the environmental issue “Population and Human health” the current state within the CE 2020 programme area is depicted using indicators which refer to the health risks mentioned above.

Noise pollution belongs to the risk factors that effect human health most significantly. Noise exposure tends to vary throughout the day and is particularly problematic during the night, as it often results in sleep disturbances[19]. Furthermore, noise pollution is accompanied by effects ranging from simple irritation to complex psychophysiological effects, but can also result is more serious consequences including cardiovascular diseases such as hypertension[20].The main sources of noise are traffic (air, railway and road), construction works and industry. Within the Member States of the OP CE 2020 an average of almost one fifth of the population (own calculation based on Eurostat data) living in households feels exposed to noise. Figure 18 provides a differentiated picture of noise exposure within the CE 2020 programme area: The highest noise exposure ratio of 25.8 % is observable in Germany, followed by 20.8 % in Italy and 19.1 % in Austria. In contrast, the effect of noise pollution on people in Croatia (10.9 %) and Hungary (9.8 %) is substantially lower.

Figure 18: Proportion of population living in households that feel exposed to noise in % (2011)

Source: Eurostat n.d. c

Furthermore, emissions in ambient air also pose a threat to human health. An example of an air pollutant which influences human health and well-being negatively is ozone. High ozone values in ambient air not only result in breathing difficulties and asthma symptoms, but can also trigger more severe lung and heart diseases[21]. As shown in Figure 19 increased levels of ozone pollution can be identified in some parts of the CE 2020 programme area. Ranging from 4497.0 µg/m^3/day to 5530.0 µg/m^3/day, the pollution values

[19] European Commission 2013b

[20] World Health Organization 2013a

[21] World Health Organization 2013b

are particularly high in the urban areas of Italy and the Slovak Republic as well as in Austria and Slovenia. In contrast, the lowest levels of ozone pollution in urban areas are observable in Poland (2814.0 µg/m^3/day) and Germany (3435.0 µg/m^3/day).

Figure 19: Exposure of urban population to air pollution caused by ozone matter in µg/m^3/day (2010)

Source: Eurostat n.d. c

Zero-option scenario

Environmental threats to human organisms are also a growing concern within the CE 2020 programme area. In line with increasing public mobility and the further depletion of atmospheric ozone, the resulting noise and rising ozone as well as fine particulate matter levels will continue to have an adverse effect on human health. In recognition of the need to reduce these existing pressures, specific threshold values have already been defined at the EU and international level (cf. Chapter 4.4). Thus, it can be assumed that measures designed to improve the environmental conditions for human well-being will most likely be taken into account, even in the absence of the OP CE 2020.

5.6 Fauna, Flora and Biodiversity

The CE 2020 programme area is characterised by a large variety of flora and fauna. The protection of this rich variety of species and ecosystems as well as the reduction of the rate of biodiversity loss form a key element of European and international species protection (cf. Chapter 4.5). For the description of the current state of the environmental issue “Fauna, Flora and Biodiversity” indicators relating to the protection of species and habitats, endangered species and biodiversity are considered.

With NATURA 2000, an extensive network of nature conservation areas within the EU has been established. The number of NATURA 2000 sites within the programme area amounts to 11,347 sites which together represent 43.5 % of all NATURA 2000 sites in the EU (cf. Figure 20).

Designated area	Total sites	Total area (km^2)	% of national area
CE 2020	11,347	276,076	43.5 %
EU-27	26,106	949,910	100 %

Figure 20: NATURA 2000 sites within the EU (based on Birds and Habitats Directive) (2011)

Source: European Commission 2011a

With regard to the NATURA 2000 sites within the CE 2020 programme area, a differentiation between absolute and relative data must be made. In absolute terms, the largest number (5,266 sites) and area (80,729 km^2) of NATURA 2000 sites can be identified in Germany, followed by Italy (2,549 sites and 62,623 km^2) and Poland (958 sites and 68,043 km^2) (cf. Figure 21). Although the Czech Republic has a large number of NATURA 2000 conservation areas, the total area amounts to only 11,072 km^2. Moreover, the smallest number of NATURA sites can be found in Slovenia (286 sites) and Austria (220 sites), whereby the former also exhibits the smallest total area of 7,205 km^2. With regard to the proportion of the respective national area designated as NATURA 2000 a different picture emerges. From this perspective the largest proportion of national area designated as NATURA 2000 conservation area is observable in Slovenia (35.5 %). In contrast, only 15.4 % of the national area in Germany is designated as NATURA 2000 sites.

Member State of the OP CE 2020	Total sites	Total area (km^2)	% of national area
Czech Republic	1,125	11,072	14.0 %
Germany	5,266	80,729	15.4 %
Italy	2,549	62,623	19.2 %
Hungary	523	19,939	21.4 %
Austria	220	12,324	14.7 %
Poland	958	68,043	19.4 %
Slovenia	286	7,205	35.5 %
Slovak Republic	420	14,141	29.0 %
Croatia[22]	n.a.	n.a.	n.a.

Figure 21: NATURA 2000 sites within the programme area of CE 2020 (based on Birds and Habitats Directive) (2011)

Source: European Commission 2011a

[22] As Croatia has only been Member of the EU since 1st July 2013, data for NATURA 2000 sites is not yet available. It is however, anticipated that 738 sites in Croatia will be integrated into the NATURA 2000 network (European Commission 2013c).

The conservation status of animals and plants can be identified on the basis of the IUCN regional Red List for Europe. With regard to the relevance for the CE 2020 programme area, the following highly endangered animal groups identified in Europe in 2011 must be considered: freshwater fish (37 %), amphibians (23 %) and mammals (15 %)[23]. Within the programme area, the endangered freshwater fish species are concentrated in the Slovak Republic, Croatia and Hungary as well as in the participating parts of Italy, Croatia and the Danube region of Austria. Threatened amphibians and mammals can primarily be found in Slovenia, Croatia and the participating parts of Italy. With regard to mammals, a further concentration of threatened species can be found in the Czech Republic, the Slovak Republic and Hungary. With regard to the conservation of plants, the most threatened populations in Europe include policy plants[24] (38.4 %), aquatic plants (15.8 %) and crop wild relatives (10.9 %). Within the programme area, threatened policy plants are primarily located in Austria, the Czech Republic, Hungary and Slovenia as well as in the participating parts of Italy and Germany. Whereas threatened aquatic plants are primarily located in Croatia, Slovenia and in the participating parts of Italy, endangered crop wild relative species can mainly be found in the participating parts of Italy.

As the diversity of bird species largely correlates with the total biodiversity, the Farmland Bird Index (FBI) serves as an indicator for biodiversity. The FBI consists of population trends for birds species primarily found in cultural landscapes. As shown in Figure 22 Hungary (105.3) and Italy (104.6) display the highest index values among the CE 2020 Member States. Compared to the baseline of 2000 a slight increase of roughly 5 index points can be noted, thus indicating a slight increase in biodiversity within each of these Member States. In Austria (77.4) and Germany (75.7), the index values are about one quarter below the baseline, indicating that the biological diversity in these Member States has decreased since 2000. In Poland (99.3) and the Czech Republic (97.3) the FBI has remained relatively stable since 2000.

Member State of the OP CE 2020	Index (2000 = 100)
Czech Republic	97,3
Germany	75,7
Italy	104,6*
Hungary	105,3
Austria	77,4
Poland	99,3
Slovenia	n.a.
Slovak Republic	n.a.
Croatia	n.a.

* data from 2007

Figure 22: Farmland Bird Index (FBI) (2008)

Source: Eurostat n.d. a

[23] European Commission 2013d

[24] The term „policy plants“ refers to plant species and subspecies listed within European or international policies.

Due to the fact that natural or semi-natural areas as well as green spaces are on the decrease in urban settings, efforts to develop and incorporate green areas are to be intensified. Amongst other things, the share of this so-called “green infrastructure” can be described in terms of the percentage green spaces constitute within urban areas. Figure 23 shows a differentiated picture for the percentage of green urban areas in core cities of the CE 2020 Member States. Ranging from 20 % to 40 % the majority of core cities within the programme area is characterised by a rather moderate share of green spaces. For Hungary, the Czech Republic and the Slovak Republic as well as for the participating parts of Italy, however, some core cities are characterised by a 60 % to 70 % share of green urban areas. In contrast, several core cities in the Czech Republic, Hungary and Poland as well as in the participating parts of Italy and Germany are characterised by a lower share of green spaces (10 % - 20 %).

Figure 23: Percentage of green urban areas in core cities (n.d.)
Source: European Environmental Agency 2012c

Zero-option scenario

The CE 2020 programme area is characterised by a large variety of species and natural areas which are to be preserved. Amongst other issues, the European ecological network NATURA 2000 has been established for this purpose and already covers a large area within the CE 2020 programme area. Thus, it is likely that the NATURA 2000 network will continue to expand, even without implementation of the OP CE 2020. In light of the relatively greater decrease in species richness throughout many parts of the CE 2020 programme area, efforts designed to reduce the rate of biodiversity loss must be continued. In line with a recently adopted EU strategy (COM 2013/0249 Enhancing Europe’s Natural

Capital) the further encouragement and promotion of green infrastructure development within urban areas can be assumed.

5.7 Cultural Heritage and Landscape

Generally speaking, cultural and regional identities and values are reflected in cultural properties and landscapes. Thus, applied to the CE 2020 programme area, the existing cultural and natural heritage and diversity must be protected. Illustrative of this diversity is, for example, the number of cultural and natural heritage sites which are part of the "UNESCO World Heritage List". Furthermore, the preservation of landscape diversity can be captured by the degree of landscape fragmentation.

According to the "UNESCO World Heritage List", 100 cultural and natural properties, including cross-border properties, associated with each member country can be identified within the CE 2020 programme area. Most of these sites are situated in the parts of Italy (21 sites) and Germany (20 sites) belonging to the CE Programme area (cf. Figure 24). With regard to the remaining CE 2020 Member States, the number of existing cultural and natural properties ranges from 3 to 13 sites. Measured against the total number of heritage sites located in the EU-27 and candidate countries (374)[25] the 100 sites located within the CE 2020 programme area account for more than one quarter of all UNESCO sites.

Member State of the OP CE 2020	Cultural sites	Natural sites	Total sites
Czech Republic	12	-	12
Parts of Germany participating in the CE Programme	19	1	20
Parts of Italy participating in the CE Programme	19	2	21
Hungary	7	1	8
Austria	9	-	9
Poland	12	1	13
Slovenia	2	1	3
Slovak Republic	5	2	7
Croatia	6	1	7

Figure 24: UNESCO World Heritages Sites within the programme area of CE 2020 (2013)

Source: UNESCO 2013

With view to the degree of landscape fragmentation within the CE 2020 programme area a differentiated picture emerges (cf. Figure 25). Compared to the other CE 2020 Member States, the degree of landscape fragmentation is particularly high in the Czech Republic (up to 35 meshes per 1.000 km^2) and the parts of Germany belonging to the CE Programme area (up to 75 meshes per 1.000 km^2). In contrast, the degree of landscape fragmentation is substantially lower in Austria and the Slovak Republic which exhibit a maximum of 7 meshes per 1.000 km^2.

[25] Besides Croatia, Turkey is another candidate country.

Figure 25: Landscape fragmentation per country (2009)

Source: European Environmental Agency 2012b

Zero-option scenario

As cultural and natural heritage is a source of cultural and local identity, it is an important factor for the development of a region. Thus, the protection of corresponding heritage sites within the CE 2020 programme area must be ensured. A large number of cultural and natural properties are already listed in the “UNESCO World Heritage List” and further properties within the CE 2020 programme area are included in the “Tentative List”. The heritage sites appear to be in a good condition which implies that this will remain so in the future. Besides the UNESCO which operates worldwide, there are also a variety of national and regional conservation programmes. Nevertheless, the preservation of landscapes within the CE 2020 programme area continues to be limited by fragmentation processes such as urban sprawl.

6. Possible effects on the environment resulting from the implementation of the CE 2020 programme and recommendations to mitigate significant negative effects

This chapter provides an overview of possible environmental effects of the OP CE 2020 which result from the environmental assessment.

As already mentioned in chapter 3.2 the methodological approach to assessing the environmental effects of the Operational Programme CENTRAL EUROPE 2020 is guided by the following central question:

"Do the Specific objectives (and corresponding potential transnational actions) related to the four priority axes identified in the Operational Programme CE 2020 have a significantly positive or negative effect on the environmental issues in the programme area ?"

To answer this question the assessment is supported by the identified guiding questions (cf. Chapter 4) and is carried out on the basis of the following 5-point-scale:

Legend for the assessment	
+	Possible occurrence of positive environmental effects
–	Possible occurrence of negative environmental effects
+/-	Possible occurrence of both positive and negative environmental effects
o	Likely no significant environmental effects
/	Assessment is not possible due to the limited availability of information

Figure 26: Legend for the assessment within the SEA process CE 2020

Source: blue | DSN, 2013

For the environmental assessment the most detailed level of programme information is used. Thus, the assessment of likely effects resulting from the OP CE 2020 is conducted at the level of the priority axis, their corresponding specific objectives and potential transnational actions. It must be noted in this context that the assessment at the programme level can only provide a general outline of possible environmental effects. This is due to the fact that more detailed information on the likely environmental effects will occur at the implementation phase of the projects.

Moreover, due to the fact that the OP CE 2020 is a ETC programme it must be considered that its key focus is on the promotion of “soft factors” such as the building and increasing of capacities including exchange of knowledge and good practice between the participating Member States. **Thus, the possible environmental effects of the OP CE 2020 will primarily be of indirect nature**. Nevertheless, the promotion of “soft factors” forms the basis for further investment activities.

The possible environmental effects of the OP CE 2020 are considered for each environmental issue and cross-cutting theme. The assessment of cross-cutting themes has been integrated into the appropriate environmental issues. The results of this assessment will be presented by providing “Findings” which present the potential effects on the respective

environmental issue and “Recommendations” which present recommendations to mitigate possible negative environmental effects.

6.1 Water

Environmental issue: Water			
Priority axis 1: Cooperating on innovation to make CENTRAL EUROPE more competitive			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 1.1: *To improve sustainable linkages among actors of the central European innovation systems for strengthening regional innovation capacity*	**o**	The Specific objective will likely have no significant effect on the environmental issue “Water”.	No recommendation
Specific objective 1.2: *To improve knowledge and skills for advancing economic and social innovation in central European regions*	**o/+**	For the most parts the Specific objective will likely have no significant effect on the environmental issue “Water”. Amongst other things, however, the build-up of skills and competences for eco-innovative technologies and processes could potentially have positive implications with regard to reducing water consumption. Given that the number of funded projects within this field is uncertain, however, the extent of positive effects cannot be sufficiently predicted.	No recommendation
Priority axis 2: Cooperating on low carbon strategies in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 2.1: *To develop and implement solutions for increasing energy efficiency and renewable energy usage in public infrastructure*	**o**	The Specific objective will likely have no significant effect on the environmental issue “Water”.	No recommendation

Priority axis 2: Cooperating on low carbon strategies in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 2.2: *To improve territorially based energy planning strategies and policies supporting climate change mitigation*	**o/-**	For the most parts the Specific objective will likely have no significant effect on the environmental issue "Water". Amongst other things, however, the likely construction of hydropower plants, as part of the promotion of renewable energy resources, could have an adverse effect on the river eco-system and result in the associated consequences (e.g. degradation of the ecological status of water).	In case a submitted project foresees the concrete planning or feasibility studies for hydropower plants specific attention should be placed on the ecological status of the water body following the national legislation and procedures in place.
Specific objective 2.3: *To improve capacities for mobility planning in functional urban areas to lower CO_2 emissions*	**o**	The Specific objective will likely have no significant effect on the environmental issue "Water".	No recommendation

Priority axis 3: Cooperating on natural and cultural resources for sustainable growth in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 3.1: *To improve integrated environmental management capacities for the protection and sustainable use of natural heritage and resources*	**+**	The Specific objective will likely have a positive effect on "Water" as the promotion of integrated environmental approaches will contribute to the protection and sustainable use of water resources. This could likely lead, for example, to an enhanced ecological and chemical status of water bodies in protected natural areas.	No recommendation
Specific objective 3.2: *To improve capacities for the sustainable use of cultural heritage and resources*	**o**	The Specific objective will likely not significantly affect the environmental issue "Water".	No recommendation

Priority axis 3: Cooperating on natural and cultural resources for sustainable growth in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 3.3: *To improve environmental management of functional urban areas to make them more liveable places*	+	The improvement of the quality of urban environment which is addressed by the Specific objective will likely have a positive effect on "Water". An integrated environmental management could, for example, contribute to a reduction of water pollution and thus to an enhanced ecological/ chemical status of water bodies in functional urban areas.	No recommendation

Priority axis 4: Cooperating on transport to better connect CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 4.1: *To improve planning and coordination of regional passenger transport systems for better connections to national and European transport networks*	o	The Specific objective will likely have no significant effect on the environmental issue "Water".	No recommendation
Specific objective 4.2 *To improve coordination among freight transport stakeholders for increasing multimodal environment-friendly freight solutions*	o/-	For the most parts the Specific objective will likely have no significant effect on the environmental issue "Water". Amongst other things, however, irrespective of whether river and sea transport is considered as most sustainable transport mode, it has to be considered that the promotion of this transport mode could contribute to an increased water pollution as well as to adverse effects on hydromorphology.	In case a submitted project foresees the promotion of river and sea transport specific attention should be placed on the ecological status of the water body and its hydromorphology following the national legislation and procedures in place.

6.2 Soil

Environmental issue: Soil[26]			
Priority axis 1: Cooperating on innovation to make CENTRAL EUROPE more competitive			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 1.1: *To improve sustainable linkages among actors of the central European innovation systems for strengthening regional innovation capacity*	**o**	The Specific objective will likely have no significant effect on the environmental issue "Soil".	No recommendation
Specific objective 1.2: *To improve knowledge and skills for advancing economic and social innovation in central European regions*	**o/+**	For the most parts the Specific objective will likely have no significant effect on the environmental issue "Soil". Amongst other issues, however, the build-up of skills and competences for eco-innovative technologies and processes could potentially have positive implications with regard to enhanced resource efficiency. Given that the number of funded projects within this field is uncertain, however, the extent of positive effects cannot be sufficiently predicted.	No recommendation
Priority axis 2: Cooperating on low carbon strategies in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 2.1: *To develop and implement solutions for increasing energy efficiency and renewable energy usage in public infrastructure*	**o**	The Specific objective will likely have no significant effect on the environmental issue "Soil".	No recommendation

[26] The cross-cutting theme "Waste and Material Resources" is considered within the assessment of possible effects on the environmental issue "Soil".

Priority axis 2: Cooperating on low carbon strategies in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 2.2: *To improve territorially based energy planning strategies and policies supporting climate change mitigation*	**o/+**	For the most parts the Specific objective will likely have no significant effect on the environmental issue "Soil". Amongst other issues, however, in case waste is used as an energy source the volume of landfill could be reduced and thus likely have a positive effect on soil resources.	No recommendation
Specific objective 2.3: *To improve capacities for mobility planning in functional urban areas to lower CO_2 emissions*	**o**	The Specific objective will likely not significantly affect the environmental issue "Soil".	No recommendation

Priority axis 3: Cooperating on natural and cultural resources for sustainable growth in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 3.1: *To improve integrated environmental management capacities for the protection and sustainable use of natural heritage and resources*	**+**	The Specific objective will likely have a positive effect on "Soil" as the promotion of integrated environmental approaches will contribute to the protection and sustainable use of soil resources. This could likely lead, for example, to reduced soil degradation in protected natural areas. In addition, the Specific objective will promote efficient management of natural resources which will likely contribute to a sustainable use of material resources.	No recommendation
Specific objective 3.2: *To improve capacities for the sustainable use of cultural heritage and resources*	**o**	The Specific objective will likely not significantly affect the environmental issue "Soil".	No recommendation

Priority axis 3: Cooperating on natural and cultural resources for sustainable growth in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 3.3: *To improve environmental management of functional urban areas to make them more liveable places*	+	The Specific objective could positively affect the environmental issue "Soil". Improving environmental management in functional urban areas could contribute, for example, to reduce soil sealing and land consumption as well as to promote the revitalisation of contaminated/brownfield sites.	No recommendation

Priority axis 4: Cooperating on transport to better connect CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 4.1: *To improve planning and coordination of regional passenger transport systems for better connections to national and European transport networks*	o	The Specific objective will likely have no significant effect on the environmental issue "Soil".	No recommendation
Specific objective 4.2 *To improve coordination among freight transport stakeholders for increasing multimodal environment-friendly freight solutions*	o	The Specific objective will likely not significantly affect the environmental issue "Soil".	No recommendation

6.3 Air and Climate

Environmental issue: Air and Climate[27]			
Priority axis 1: Cooperating on innovation to make CENTRAL EUROPE more competitive			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 1.1: *To improve sustainable linkages among actors of the central European innovation systems for strengthening regional innovation capacity*	**o**	The Specific objective will likely have no significant effect on the environmental issue "Air and Climate.	No recommendation.
Specific objective 1.2: *To improve knowledge and skills for advancing economic and social innovation in central European regions*	**o/+**	For the most parts the Specific objective will likely have no significant effect on the environmental issue "Air and Climate". Amongst other issues, however, the build-up of skills and competences in the field of eco-innovation and innovation for low-carbon solutions could potentially have positive implications with regard to the reduction of air pollutants/GHG and the enhancement of energy efficiency in general. Given that the number of funded projects within this field is uncertain, however, the extent of positive effects cannot be sufficiently predicted.	No recommendation.

[27] The cross-cutting themes "Energy Resources" and "Mobility and Transport" are considered within the assessment of possible effects on the environmental issue "Air and Climate".

Priority axis 2: Cooperating on low carbon strategies in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 2.1: *To develop and implement solutions for increasing energy efficiency and renewable energy usage in public infrastructure*	+	The Specific objective will have a positive effect on the environmental issue "Air and Climate". Improving energy efficiency and strengthening the usage of renewable energy sources of public infrastructure including buildings will likely lead to a reduction of harmful emissions, in particular GHG-emissions. The expected reduction of GHG could contribute to climate change mitigation.	No recommendation
Specific objective 2.2: *To improve territorially based energy planning strategies and policies supporting climate change mitigation*	+	The Specific objective will affect "Air and Climate" in a positive way. For example, by promoting strategies to increase the use of renewable energies ant to improve the energy performance in general air pollutants (such as GHG-emissions) will most likely decrease. Consequently, this could contribute to climate change mitigation.	No recommendation
Specific objective 2.3: *To improve capacities for mobility planning in functional urban areas to lower CO_2 emissions*	+	The Specific objective will have a positive effect on "Air and Climate". The strengthening of low carbon mobility in functional urban areas will lead to lower concentrations of air pollutants and GHG. The expected reduction of GHG could contribute to climate change mitigation.	No recommendation

Priority axis 3: Cooperating on natural and cultural resources for sustainable growth in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 3.1: *To improve integrated environmental management capacities for the protection and sustainable use of natural heritage and resources*	+	The Specific objective will have a positive effect on "Air and Climate". The protection and sustainable use of natural resources such as air will contribute to achieving better air quality.	No recommendation
Specific objective 3.2: *To improve capacities for the sustainable use of cultural heritage and resources*	o	The Specific objective will likely not significantly affect the environmental issue "Air and Climate".	No recommendation
Specific objective 3.3: *To improve environmental management of functional urban areas to make them more liveable places*	+	The Specific objective could positively affect the environmental issue "Air and Climate". Improving environmental management in functional urban areas could contribute, for example, to a decrease in the concentration of air pollutants such as particulate matters.	No recommendation

Priority axis 4: Cooperating on transport to better connect CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 4.1: *To improve planning and coordination of regional passenger transport systems for better connections to national and European transport networks*	+	The Specific objective will likely effect the environmental issue "Air and Climate" in a positive way. For example, the Specific objective focuses on improving regional public transport systems which could lead to a reduction of motorised private transport. As a consequence CO_2 emissions will likely decrease.	No recommendation

Priority axis 4: Cooperating on transport to better connect CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 4.2 *To improve coordination among freight transport stakeholders for increasing multimodal environment-friendly freight solutions*	**+**	The Specific objective will likely have a positive effect on "Air and Climate". Promoting the multimodality and the environmental sustainability of freight transport will likely contribute to the reduction of air pollutants and GHG in a positive way.	No recommendation

6.4 Population and Human Health

Environmental issue: Population and Human Health			
Priority axis 1: Cooperating on innovation to make CENTRAL EUROPE more competitive			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 1.1: *To improve sustainable linkages among actors of the central European innovation systems for strengthening regional innovation capacity*	**o**	The Specific objective will likely have no significant effect on the environmental issue "Population and Human Health".	No recommendation
Specific objective 1.2: *To improve knowledge and skills for advancing economic and social innovation in central European regions*	**o/+**	For the most parts the Specific objective will likely have no significant effect on the environmental issue "Population and Human Health". Amongst other issues, however, the strengthening of competences in the field of social innovation - as for example health care - could likely have a positive effect on "Population and Human Health". Given that the number of funded projects within this field is uncertain, however, the extent of positive effects cannot be sufficiently predicted.	No recommendation

Priority axis 2: Cooperating on low carbon strategies in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 2.1: *To develop and implement solutions for increasing energy efficiency and renewable energy usage in public infrastructure*	**o/+**	The Specific objective will likely have no significant effect on the environmental issue "Population and Human Health". Amongst other issues, however, it has to be considered that air pollution caused by fossil fuels will be reduced by promoting energy efficiency and renewable energy usage in public infastructure. This could positively affect human well-being.	No recommendation
Specific objective 2.2: *To improve territorially based energy planning strategies and policies supporting climate change mitigation*	**o/+**	The Specific objective will likely have no significant effect on the environmental issue "Population and Human Health". Amongst other issues, however, a positive effect of the Specific objective on "Population and Human Health" could be expected due to the better exploitation and enhanced use of renewable energy sources. The resulting reduction of emissions caused by fossil fuels will contribute to lowering health risks.	No recommendation
Specific objective 2.3: *To improve capacities for mobility planning in functional urban areas to lower CO_2 emissions*	**o/+**	The Specific objective will likely have no significant effect on the environmental issue "Population and Human Health". Amongst other issues, however, the improvement of air quality by strengthening low-carbon mobility in functional urban areas is particularly likely to benefit human health	No recommendation

in a positive way.

Priority axis 3: Cooperating on natural and cultural resources for sustainable growth in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 3.1: *To improve integrated environmental management capacities for the protection and sustainable use of natural heritage and resources*	**o/+**	The Specific objective will likely have no significant effect on the environmental issue "Population and Human Health". Amongst other issues, however, the protection and sustainable use of natural resources could contribute to human well-being by improving healthy living conditions. This could be the case as natural areas are, for example, used as recreation areas.	No recommendation
Specific objective 3.2: *To improve capacities for the sustainable use of cultural heritage and resources*	**o/+**	The Specific objective will likely have no significant effect on the environmental issue "Population and Human Health". Amongst other issues, however, a better management of cultural heritage can contribute to more attractive cultural offers being relevant for human wellbeing.	No recommendation
Specific objective 3.3: *To improve environmental management of functional urban areas to make them more liveable places*	**+**	The Specific objective will likely have a positive effect on "Population and Human Health". A general improvement of environmental quality in urban areas will induce healthier living conditions for humans. This can be most notably achieved by reducing air, soil and water pollution.	No recommendation

Priority axis 4: Cooperating on transport to better connect CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 4.1: *To improve planning and coordination of regional passenger transport systems for better connections to national and European transport networks*	**o/+**	The Specific objective will likely have no significant effect on the environmental issue "Population and Human Health". Amongst other issues, however, the improvement of the regional public transport system could contribute to a reduction of emissions which could positively affect human well-being	No recommendation
Specific objective 4.2 *To improve coordination among freight transport stakeholders for increasing multi-modal environment-friendly freight solutions*	**o/+**	The Specific objective will likely have no significant effect on the environmental issue "Population and Human Health". Amongst other issues, however, promoting the multimodality and the environmental sustainability of freight transport within this Specific objective will likely have a positive effect on "Population and Human Health" as fossil fuel emissions will be reduced. Moreover, potential noise pollution will also most likely be reduced.	No recommendation

6.5 Fauna, Flora and Biodiversity

Environmental issue: Fauna, Flora and Biodiversity			
Priority axis 1: Cooperating on innovation to make CENTRAL EUROPE more competitive			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 1.1: *To improve sustainable linkages among actors of the central European innovation systems for strengthening regional innovation capacity*	**o**	The Specific Objective will likely have no significant effect on the environmental issue "Fauna, Flora and Biodiversity".	No recommendation
Specific objective 1.2: *To improve knowledge and skills for advancing economic and social innovation in central European regions*	**o/+**	For the most parts the Specific objective will likely have no significant effect on the environmental issue "Flora, Fauna and Biodiversity". Amongst other issues, however, the build-up of skills and competences in the field of eco-innovation and innovation for low-carbon solutions could potentially have positive implications with regard to the reduction of air pollutants/ GHG. This could lead to a reduction of acid rain and thus to an enhanced ecological status of flora and fauna. Given that the number of funded projects within this field is uncertain, however, the extent of positive effects cannot be sufficiently predicted.	No recommendation

Priority axis 2: Cooperating on low carbon strategies in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 2.1: *To develop and implement solutions for increasing energy efficiency and renewable energy usage in public infrastructure*	**o/+**	The Specific Objective will likely have no significant effect on the environmental issue "Fauna, Flora and Biodiversity". Among other issues, however, promoting more energy efficient solutions and renewable energy usage helps to reduce CO_2 emissions and with this, it helps to mitigate climate change effects which affect in particular biodiversity.	No recommendation
Specific objective 2.2: *To improve territorially based energy planning strategies and policies supporting climate change mitigation*	**o/+/-**	For the most parts the Specific objective will likely have no significant effect on the environmental issue "Flora, Fauna and Biodiversity". Amongst other issues, however, if the use of renewable energy sources is too one-sided (e.g. cultivation of corn monocultures for biomass production) a loss of biodiversity could occur, for example, where biomass production is based on corn monocultures. Nevertheless the use of solar fields in the landscape could have a positive effect on biodiversity since they serve as extensive grassland areas.	The OP CE 2020 should contractually (e.g. in the subsidy contract) remind the respecting of environmental legislation in the implementation.

Priority axis 2: Cooperating on low carbon strategies in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 2.3: *To improve capacities for mobility planning in functional urban areas to lower CO_2 emissions*	**o/+**	The Specific Objective will likely have no significant effect on the environmental issue "Fauna, Flora and Biodiversity". Among other issues, however, promoting capacities for mobility planning aim to lower CO_2 emissions and according to this, it helps to mitigate climate change effects which affect in particular biodiversity.	No recommendation

Priority axis 3: Cooperating on natural and cultural resources for sustainable growth in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 3.1: *To improve integrated environmental management capacities for the protection and sustainable use of natural heritage and resources*	**+**	The Specific objective will likely affect "Fauna, Flora and Biodiversity" in a positive way due to the protection and sustainable use of natural heritage and resources. The implementation of integrated strategies which focus on the preservation and protection of eco-systems could, for example, lead to a positive development of species populations.	No recommendation
Specific objective 3.2: *To improve capacities for the sustainable use of cultural heritage and resources*	**o**	The Specific objective will possibly have no significant effect on "Fauna, Flora and Biodiversity".	No recommendation

Priority axis 3: Cooperating on natural and cultural resources for sustainable growth in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 3.3: *To improve environmental management of functional urban areas to make them more liveable places*	+	The Specific objective could potentially have a positive impact on "Fauna, Flora and Biodiversity". The improvement of environmental quality with regard to air, soil and water could contribute to "Fauna, Flora and Biodiversity" in a positive way as these resources form the basis of animal and plant life.	No recommendation

Priority axis 4: Cooperating on transport to better connect CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 4.1: *To improve planning and coordination of regional passenger transport systems for better connections to national and European transport networks*	o	The Specific objective will likely have no significant effect the environmental issue "Fauna, Flora and Biodiversity".	No recommendation
Specific objective 4.2 *To improve coordination among freight transport stakeholders for increasing multimodal environment-friendly freight solutions*	o	The Specific objective will likely have no significant effect on "Fauna, Flora and Biodiversity".	No recommendation

6.6 Cultural Heritage and Landscape

Environmental issue: Cultural and Natural Heritage and Landscape			
Priority axis 1: Cooperating on innovation to make CENTRAL EUROPE more competitive			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 1.1: *To improve sustainable linkages among actors of the central European innovation systems for strengthening regional innovation capacity*	**o**	The Specific objective will likely have no significant effect on the environmental issue "Cultural Heritage and Landscape".	No recommendation
Specific objective 1.2: *To improve knowledge and skills for advancing economic and social innovation in central European regions*	**o**	The Specific objective will likely have no significant effect on the environmental issue "Cultural Heritage and Landscape".	No recommendation
Priority axis 2: Cooperating on low carbon strategies in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 2.1: *To develop and implement solutions for increasing energy efficiency and renewable energy usage in public infrastructure*	**o**	The Specific objective will likely have no significant effect on "Cultural Heritage and Landscape".	No recommendation
Specific objective 2.2: *To improve territorially based energy planning strategies and policies supporting climate change mitigation*	**o/-**	For the most parts the Specific objective will likely have no significant effect on the environmental issue "Cultural Heritage and Landscape". Amongst other issues, however, the enhanced use of renewable energy resources such as wind energy plants could lead to adverse modifications of the characteristic natural and cultural landscape.	The OP CE 2020 should contractually (e.g. in the subsidy contract) remind the respecting of environmental legislation in the implementation.

Priority axis 2: Cooperating on low carbon strategies in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 2.3: *To improve capacities for mobility planning in functional urban areas to lower CO_2 emissions*	**o**	The Specific objective will likely have no significant effect on "Cultural Heritage and Landscape".	No recommendation

Priority axis 3: Cooperating on natural and cultural resources for sustainable growth in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 3.1 *To improve integrated environmental management capacities for the protection and sustainable use of natural heritage and resources*	**+**	The Specific objective will likely have a positive effect on the protection and preservation of cultural or natural landscapes. Due to the fact that landscapes are subject to various pressures (e.g. from transport or intensive agriculture) sustainable planning and management could, for example, lead to a reduction of land consumption and fragmentation. This is particularly relevant to the eastern parts of the programme area, as preservation potential still exists for extensive and intact landscape areas.	No recommendation
Specific objective 3.2 *To improve capacities for the sustainable use of cultural heritage and resources*	**+**	The Specific objective will have a positive effect on the environmental issue "Cultural Heritage and Landscape", for example, by promoting integrated approaches with focus on sustainable use of cultural heritage and resources.	No recommendation.

Priority axis 3: Cooperating on natural and cultural resources for sustainable growth in CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 3.3 *To improve environmental management of functional urban areas to make them more liveable places*	+	The Specific objective will have a positive effect on "Cultural Heritage and Landscape. For example, urban challenges such as land consumption due to on-going urbanisation processes or the regeneration of brownfields are tackled within the Specific objective.	No recommendation

Priority axis 4: Cooperating on transport to better connect CENTRAL EUROPE			
Specific objective	**Assessment**	**Findings**	**Recommendations**
Specific objective 4.1: *To improve planning and coordination of regional passenger transport systems for better connections to national and European transport networks*	o	The Specific objective will likely have no significant effect on "Cultural Heritage and Landscape".	No recommendation
Specific objective 4.2 *To improve coordination among freight transport stakeholders for increasing multimodal environment-friendly freight solutions*	o	The Specific objective will likely have no significant effect on "Cultural Heritage and Landscape".	

6.7 Overview of possible effects of the OP CE 2020 on the environmental issues

This figure provides an overview of possible effects on the environmental issues resulting from the OP CE2020. The cross-cutting themes have been integrated into the assessment of the respective environmental issue. Accordingly, the theme “Waste and Material Resources” is assigned to “Soil” and the themes “Energy Resources” and “Mobility and Transport” to the environmental issue “Air and Climate”.

It has to be noted that the possible environmental effects of the OP CE 2020 will **primarily be of indirect nature** (cf. Chapter 6)**.**

	Environmental issues					
	Water	Soil	Air and Climate	Population and Human Health	Fauna, Flora and Biodiversity	Cultural Heritage and Landscape
Priority axis 1: Cooperating on innovation to make CENTRAL EUROPE more competitive						
Specific objective 1.1	o	o	o	o	o	o
Specific objective 1.2	o/+	o/+	o/+	o/+	o/+	o
Priority axis 2: Cooperating on low carbon strategies in CENTRAL EUROPE						
Specific objective 2.1	o	o	+	o/+	o/+	o
Specific objective 2.2	o/-	o/+	+	o/+	o/+/-	o/-
Specific objective 2.3	o	o	+	o/+	o/+	o
Priority axis 3: Cooperating on natural and cultural resources for sustainable growth in CENTRAL EUROPE						
Specific objective 3.1	+	+	+	o/+	+	+
Specific objective 3.2	o	o	o	o/+	o	+
Specific objective 3.3	+	+	+	+	+	+
Priority axis 4: Cooperating on transport to better connect CENTRAL EUROPE						
Specific objective 4.1	o	o	+	o/+	o	o
Specific objective 4.2	o/-	o	+	o/+	o	o

Legend for the assessment	
+	Possible occurrence of positive environmental effects
–	Possible occurrence of negative environmental effects
+/-	Possible occurrence of both positive and negative environmental effects
o	Likely no significant environmental effects
/	Assessment is not possible due to the limited availability of information

6.8 Supplementary suggestions

The following figure provides an overview of "Suggestions" which arose additionally from the environmental assessment. These suggestions are not obligatory to consider within the OP CE 2020 in order to ensure that the OP CE will not affect the environment in a negative way. These "Suggestions" can rather be understood as supplementary advice to several Specific objectives and environmental issues without a direct linkage to a negative assessment. Thus, the "Suggestions" contrast with the "Recommendations" which have been deduced from a potentially negative effect on the corresponding environmental issue.

Specific objective(s)	Environmental issue(s)	Supplementary suggestions
2.2	-	In general, it should be considered that renewable energy resources are used in a balanced mix which depends on specific locational factors and conditions.
3.1	Cultural Heritage and Landscape	In general, it should be considered that the sustainable use of natural heritage and resources as a driving force for regional development often results in land-use conflicts. Most commonly, these conflicts occur between protection objectives on the one hand and economic objectives such as tourism on the other. Thus, in order to ensure the sustainability of the overall project, the project applicants should describe the contribution of the project to the horizontal issue of sustainability within the application form.
3.2	Cultural Heritage and Landscape	In general, it should be considered that the sustainable use of cultural heritage and resources as a driving force for regional development often results in land-use conflicts. Most commonly, these conflicts occur between protection objectives on the one hand and economic objectives such as tourism on the other. Thus, in order to ensure the sustainability of the overall project, the project applicants should describe the contribution of the project to the horizontal issue of sustainability within the application form.
3.2	Water, Soil, Air and Climate, Flora, Fauna and Biodiversity	In general, it should be considered that in cases where a cultural heritage site is surrounded by natural (sensitive) areas, an intensification of tourism could have negative effects on the site's surrounding areas and thus on several environmental issues. As a consequence, if a cultural heritage site is located in natural (sensitive) areas, possible effects on its surroundings should be considered in projects which focus on sustainable tourism in cultural heritage areas. In this way, a sustainable development as well for the surrounding of the cultural heritage will be ensured.
4.1/4.2	-	The Specific objective 4.1 could go hand in hand with Specific objective 4.2. Thus, the improvement of passenger transport systems could consider solutions linked to the freight transport system in order to allow for the best possible use of transport routes.

7. Monitoring measures

According to Article 10 of the SEA Directive, possible significant environmental effects of the implementation of the Operational Programme CE 2020, identified within the existing environmental assessment, are to be monitored in order to identify at an early stage unforeseen adverse effects and to be able to undertake appropriate remedial action.

In the following, different types of measures which contribute to identification and monitoring of possible significant environmental effects on the environmental issues resulting from the implementation of the OP CE 2020 are presented for both the programme and project levels. When setting up monitoring measures it has to be basically considered that "exisiting monitoring arrangements may be used if appropriate with a view to avoiding duplication of monitoring"[28].

Programme level

- The monitoring of the identified possible significant environmental effects should form an integral part of the OP CE 2020 implementation structure throughout the entire duration of the programme. In order to achieve this, the monitoring of the identified possible significant effects on the environment should be incorporated into the monitoring framework of the programme.

Project level

- Within the quality assessment of the project proposals possible effects on the environment should be considered as a horizontal issue taking into consideration also the results of the environmental assessment within this SEA report. In this way, possible negative effects could be identified before implementation and appropriate mitigation measures designed to address potential adverse effects of the projects.
- With regard to this it has to be ensured that assessment of project applications is carried out by assessors (JTS and external experts) with the necessary environmental expertise. The choice of experts should be done based on the necessary expertise in relation to the project topic. In the event that possible environmental effects of the proposed projects are difficult to determine additional external environmental experts should be consulted. In case a project concerns a Specific objective for which potential negative effects have been identified in the SEA, this will be considered for the choice of experts.

[28] SEA Directive Article 10, paragraph 2

- Furthermore, the project applicants should describe within the application forms which possible environmental effects the project will likely have. This could for example be supported by the guiding questions derived from environmental protection objectives such as developed for each environmental issue within this environmen-tal report or be supported by an self-assessment by the projects such as exampla-tory presented below. A brief evaluation scheme within the application documents could be:

Assess (please mark with a cross) the likely effect of the project on the environment

Environmental issues	Possible positive environmental effects	No significant environmental effects	Possible negative environmental effects
Water			
Soil			
Air and Climate			
Population and Human Health			
Fauna, Flora and Biodiversity			
Cultural Heritage and Landscape			

(It could be emphasized that the Program management like to see proposals for interventions that counteract possible negative effects or mitigate these.)

- All projects have to comply with the relevant EU and national environmental legislation and therein foreseen procedures during the implementation phase of the projects. The obligation to comply with the relevant legislation should be included in the subsidy contract of each project.
- Monitoring measures implemented at national level (if applicable) should be made use of to the possible extent and should be included in the Final Report of the project where the project partners should describe the environmental effects of the project and if applicable the adherence to EU and national environmental regulations.
- Data collected as part of the application form (description of possible environmental effects) during the application phase as well as data from the implementation phase of the projects should be considered within the monitoring framework of the programme.

Annex

Annex A: List of abbreviations

Annex B: Bibliography

Annex A: List of abbreviations

CE	Central Europe
CE 2020	CENTRAL EUROPE Programme 2014-2020
CPR	Common Provision Regulation
CSF	Common Strategic Framework
EAP	Environmental Action Programme
ETC	European Transnational Programme
FBI	Farmland Bird Index
GHG	greenhouse gas
IUNC	International Union for Conservation of Nature
JTS	Joint Technical Secretariat
MA	Managing Authority
OP	Operational Programme
OP CE 2020	Operational Programme CENTRAL EUROPE 2020
PM	particulate matter
RDB	Reference Data Base
SEA	Strategic Environmental Assessment
SG	Steering Group for the CENTRAL EUROPE Programme 2014+
TO	Thematic objective
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
WEI	water exploitation index
WHO	World Health Organization

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