Sixth Framework Programme
Specific Targeted Research or Innovation Project

(IMP)3

(IMP)3 Policy Options
D 5.2 Final Report

IMProving the IMPlementation of Environmental IMPact Assessment

funded by the Community's
Sixth Framework Programme

(IMP)3 Project team

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UBA, Umweltbundesamt (Federal Environment Agency)	Austria
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FOREWORD

The project (IMP)3 – IMProving the IMPlementation of Environmental IMPact Assessment is carried out within the 6th framework programme and investigates the application of Environmental Impact Assessment (EIA) in Europe. It ties in with the results of the report from the Commission to the European Parliament and the Council that revealed that there are still weaknesses as well as considerable variability in the Member States' implementation of the EIA Directive 85/337/EEC.

(IMP)3 focuses on the analysis and the improvement of the application of EIA concerning human health, risk assessment and project types subject to EIA. It was accompanied by an effective communication-process with DG Research and DG Environment. We would like to thank Marialuisa Tamborra, Laura Tabellini and David Aspinwall for their support.

The final report "(IMP)3 Policy Options" at hand summarizes main results of the desk research and empirical research on the implementation of the EIA Directive and the actual application of EIA on the ground across Europe and presents possible policy options in order to improve EIA application in the three different fields (human health, risk assessment and project types subject to EIA). It sums up the following three subject-specific reports of (IMP)3 that provide more detailed research results on each subject:

- The report "Human health and EIA" was elaborated by Tuija Hilding-Rydevik (work package leader), Åsa Pettersson and Arto Ruotsalainen (Nordregio); Nicola Pearce, Lynnette Thomas and Salim Vohra (WCfH); and Mária Hrnčárová, Zuzana Lieskovská and Katarína Palúchová (SAŽP).
- The report "Risk Assessment" was elaborated by Wolfgang Lexer (work package leader) and Bernhard Schwarzl (UBA); and Katarina Paluchova (SZAP).
- The report "Projects subject to EIA" was elaborated by Sabine Mayer (work package leader, UBA); Paulo Pinho, Sara Santos Cruz and Maria Rita Correia (CITTA); Mária Hrnčárová, Zuzana Lieskovská and František Parišek (SAŽP).

The team elaborating the final report included Erich Dallhammer and Antonia Cornaro (ÖIR); and Paulo Pinho, Sara Santos Cruz and Maria Rita Correia (CITTA) and the work package leaders of the thematic reports Tuija Hilding-Rydevik, Wolfgang Lexer and Sabine Mayer.

The research is based on empirical investigations of the application of EIA in the European Member States surveyed by a questionnaire spread across European EIA-stakeholders and interviews in ten European countries. Empirical research was supported by desk studies on the regulatory framework and the theoretical background of each subject. We would like to thank the 183 EIA experts who returned the questionnaire and the 53 interviewees in Europe, USA and Canada for their support. Their input formed the empirical data basis of our research.

The results of (IMP)3 shall provide decision support to the policy making process on Community level, contribute to an improved knowledge basis on EIA application and stimulate discussions within the European EIA community.

1 CONTEXT OF THE STUDY

The development of projects[1], as e.g. the construction of main roads and railway-lines, the development of industrial plants, shopping centres and theme parks, etc. can cause adverse effects to the environment. Therefore the European Union has enacted the EIA-Directive (Directive 85/337/EEC) to perform an assessment of the environmental effects of those projects which are likely to have significant effects on the environment (environmental impact assessment – EIA).

The EIA Directive has been in place for almost 20 years. A report of the Commission to the European Parliament and the Council evaluated its application and effectiveness and revealed that there are still weaknesses as well as considerable variability in the Member States' implementation.[2] As a result the Commission aimed for a deeper evaluation of problematic aspects of the EIA Directive and launched a project within the 6th framework programme.

The project IMProving the IMPlementation of Environmental IMPact Assessment – (IMP)3 is based on the results of the report from the Commission to the European Parliament and the Council on the application and effectiveness of the EIA Directive. Concentrating on some of the weak points the report outlined, (IMP)3 focuses on three main objectives:

- Objective A: a better incorporation of human health aspects into EIA;
- Objective B: a better integration and more consistency of risk assessments, regarding various sources of risks (natural hazards, accidents, sabotage); and
- Objective C: a survey of project types subject to EIA particularly focusing on various screening methods, different sets of project types and threshold values/criteria applied.

The study of (IMP)3 was carried out by an international and interdisciplinary team, consisting of members from the following institutions:

- ÖIR – Österreichisches Institut für Raumplanung (Austrian Institute for Regional Studies and Spatial Planning); Austria
- UBA – Umweltbundesamt (Federal Environment Agency); Austria
- WCH – Wales Centre for Health; United Kingdom
- Nordregio – Nordic Centre for Spatial Development; Sweden
- CITTA – Research Centre for Territory, Transports and Environment at the Faculty of Engineering of the University of Oporto, Portugal
- SAŽP – Slovenská Agentúra Životného Prostredia (Slovak Environmental Agency)

[1] For the purposes of the EIA Directive "project" means: the execution of construction works or of other installations or schemes; and, other interventions in the natural surroundings and landscape including those involving the extraction of mineral resources.

[2] Report from the Commission to the European Parliament and the Council on the application and effectiveness of the EIA Directive (Directive 85/337/EEC as amended by Directive 97/11/EC). How successful are the Member States in implementing the EIA Directive.

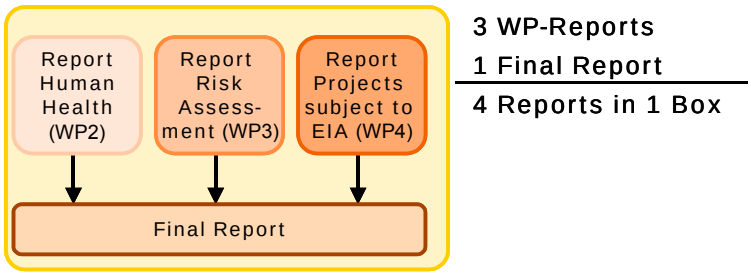
(IMP)3 shall provide an important input to the process of improving the application of EIA, also considering potential amendments to the EIA Directive and aims to stimulate discussions within the European EIA community. The suggestions for potential steps to be taken are primarily addressed to the European Commission.

1.1 Structure of the study

The final report at hand "(IMP)3 Policy Options" summarises the results of the research conducted in order to improve the EIA-application in Europe. It provides general conclusions, a discussion about the linkages between the thematic issues, and it includes an outlook about further research needed. The detailed research in the fields of human health, risk assessment and project types subject to EIA are laid down within the following three additional, sectoral reports:

- "Human Health and EIA";
- "Risk Assessment"
- "Projects Subject to EIA"

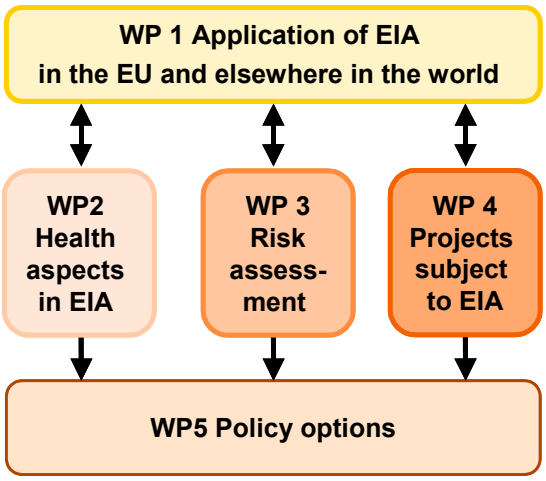
These sectoral reports comprise all relevant information about the results within each main theme of (IMP)3. So each of them can be read and understood without reading the other reports.



Structure of the study

The structure of the final report "(IMP)3 Policy Options" follows the structure of the research conducted in (IMP)3, which was organised along five work packages (WP):

- Chapter 1 sums up the general results of WP1 that focused on the gathering of empirical data about, including the dissemination of a questionnaire to EIA-stakeholders in all 25 Member States and interviews with EIA-stakeholders;
- Chapter 2 deals with the results of WP2 "Human health" focusing on a better incorporation of human health aspects into EIA;
- Chapter 3 concentrates on the results of WP3 "Risk assessment"
- Chapter 4 focuses on WP4 "Projects subject to EIA"
- Chapter 5 finally investigates the inter-relationship between the thee main issues of (IMP)3 and provides an outlook on further research needed. It concentrates on the work, done in WP5 "policy options".



Structure of the research of (IMP)3

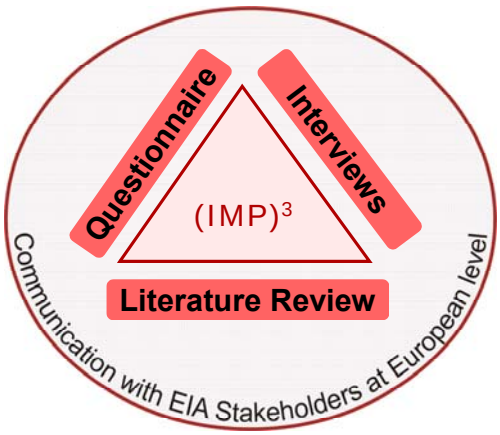
1.2 Methodology

1.2.1 The "triangle-approach" of (IMP)3

Research on the improvement of the application of the environmental impact assessment needs a sound literature review, including especially existing evaluation reports and different types of national legislation as well as a sufficient communication with EIA-stakeholders and applicants in Europe and with EIA-experts at the European level.

Even if the investigation of the three core fields of research conducted in (IMP)3 (human health, risk assessment and projects subject to EIA) requires the analysis of rather different sources in order to meet the needs of the future of each thematic field, all three are dealing with the same general issue, the application of EIA in Europe.

Thus, for gathering the data required from various sources, a kind of "triangle-approach" was developed. Thereby, the literature review forms the basis of the "research triangle", whereas both sides cover the communication-tools with the EIA-applicants in Europe: on one side a questionnaire was distributed to about 970 EIA-stakeholders and on the other side interviews have been conducted with 64 selected EIA-experts.



(IMP)3 "triangle-approach" for gathering and analysing data

Consequently, (IMP)3 deals with three different types of data available:

- qualitative data concerning the legal basis and the relevant discussions in the scientific world of EIA policy and application as laid down in the literature;
- quantitative data about the actual application of EIA in the EU Member States deriving from the analysis of the questionnaire; and
- qualitative data about the estimation of the strong and weak points of EIA-application in selected European countries gained from the analysis of the interviews conducted.

In addition to the analysis of the relevant sources and data, a communication-strategy with relevant stakeholders on EU-level was set up.

1.2.2 Literature review

The literature review covers the existing relevant literature including the main documents at European level and selected national laws concerning the application of EIA. The results of the research are presented in the WP-reports.

1.2.3 Questionnaire

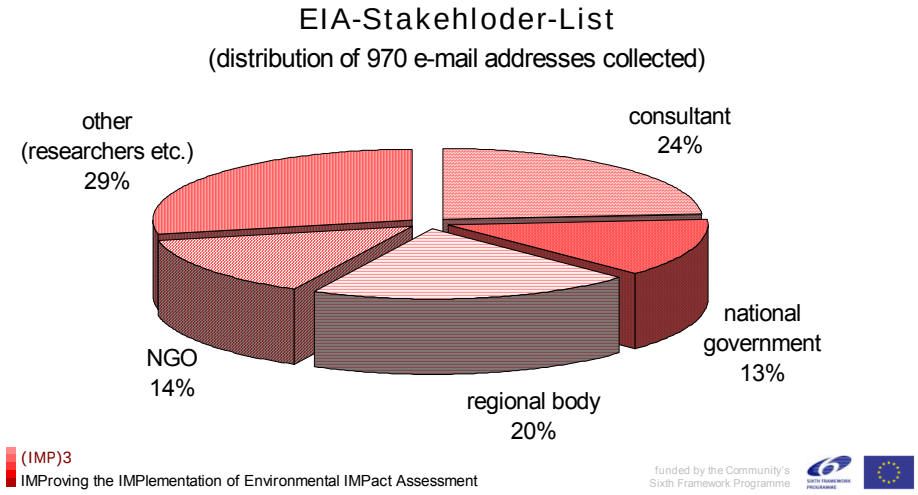
The questionnaire and the interviews aimed to provide an overview of the experience of the actual EIA implementers in Europe in terms of human health, risk assessment and EIA project types. Therefore (IMP)3 not only addressed the administrative staff at the national level who is dealing with EIAs. Moreover, it addressed the very basis of the EIA-applications including consultants and NGOs. So it was necessary to involve a broad spectrum of representatives of different types of stakeholders. The different EIA-stakeholder-groups addressed are:

- representatives of national governments,
- regional bodies with competence in EIA-issues,
- NGO's,
- representatives of the private sector as e.g. consultants,
- others as e.g. researchers.

Database: stakeholder list

A list of EIA-stakeholders in the European Member States served as a database for the distribution of the questionnaire and the selection of the interview-partners. The list was established by the use of the expert-network of the (IMP)3-team members with the support of members of the EIA/SEA expert group.

All in all, 970 EIA-stakeholders have been selected representing the different types of stakeholders. However, in statistical terms they do not represent a random sample of all actors being involved in EIA issues throughout Europe, moreover it is a list of experts directly dealing with the application of EIAs.



Types of EIA-stakeholders covered by the stakeholder list

As most of the stakeholders are practitioners, their answers reflect mainly the situation they are confronted with day by day while doing their job. Consequently, they mirror the nature and mode of application of the EIA Directive that is currently in place in national and regional legislation throughout the EU Member States.

Thus the empirical results derived from this data source are based on personal perceptions of the EIA-stakeholders and are mainly valid for the empirical sample of (IMP)3. They give indications to actual EIA practices and cannot be generalized. Nevertheless, the different approaches of the various stakeholder groups show a picture that does reflect a broad practice picture ranging from administrative practice to consultant and methodological practice.

Development and distribution of the questionnaire

As the aim of the questionnaire was to get a broad view of the situation in Europe and due to the limited time of practitioners to complete the questionnaire, it had to be kept short and simple. So it focused mainly on multiple choice answers, usually combined with one additional open question at the end. The questionnaire was developed by an interactive process between all partners of the (IMP)3-team in close collaboration with representatives of DG Environment.

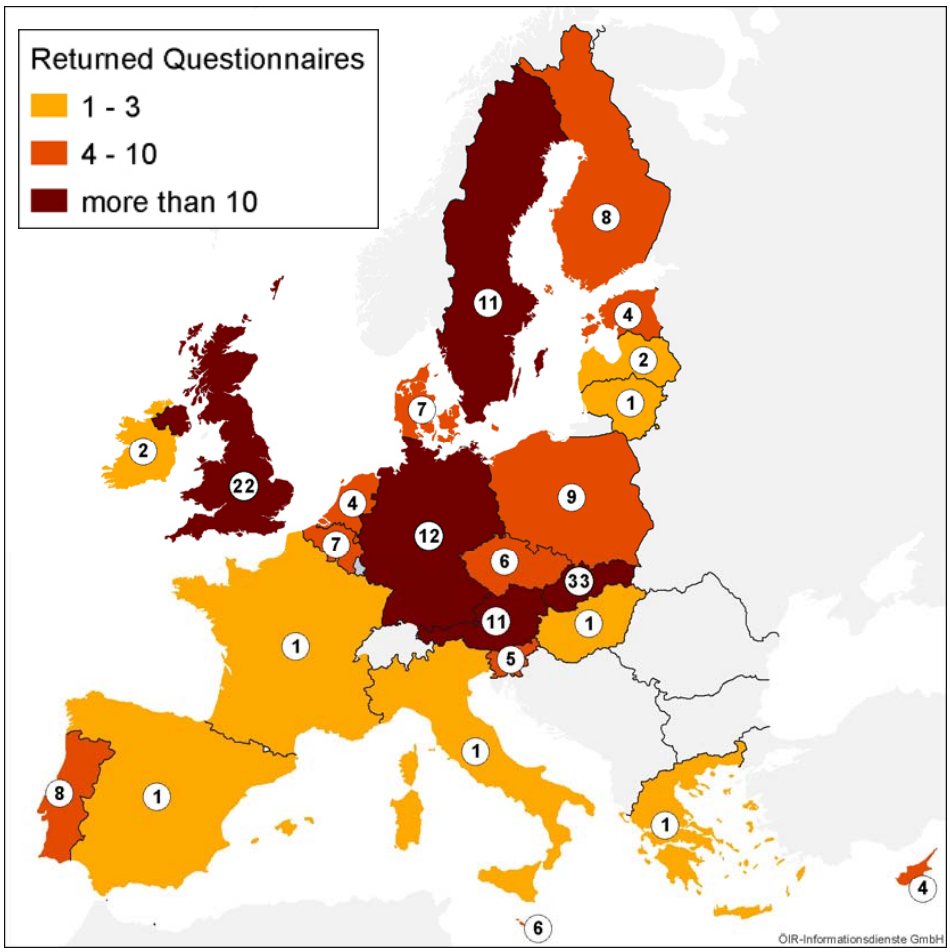
Based on the list of EIA-stakeholders, the questionnaire was disseminated via e-mail to 970 addresses. The questionnaire was attached to a covering letter prepared in eleven languages (English, Czech, Finnish, French, German, Hungarian, Polish, Portuguese, Slovak, Spanish and Swedish).

Return rates

Within the first two weeks after distributing the questionnaire, 106 completed questionnaires have been returned. After a second reminder another 77 were transmitted. So, all in all, the analysis of (IMP)3 is based on 183 completed questionnaires, bringing the return rate to 19%.

Represented countries

According to the response rate, the numbers of respondents from each Member State vary largely. Most questionnaires were returned from Slovakia (33 respondents), the UK (22), followed by Germany (12) Austria (11) and Sweden (11). So 30% of respondents come from just two countries (18% from Slovakia and 12% from the UK).



Geographical distribution of questionnaires returned

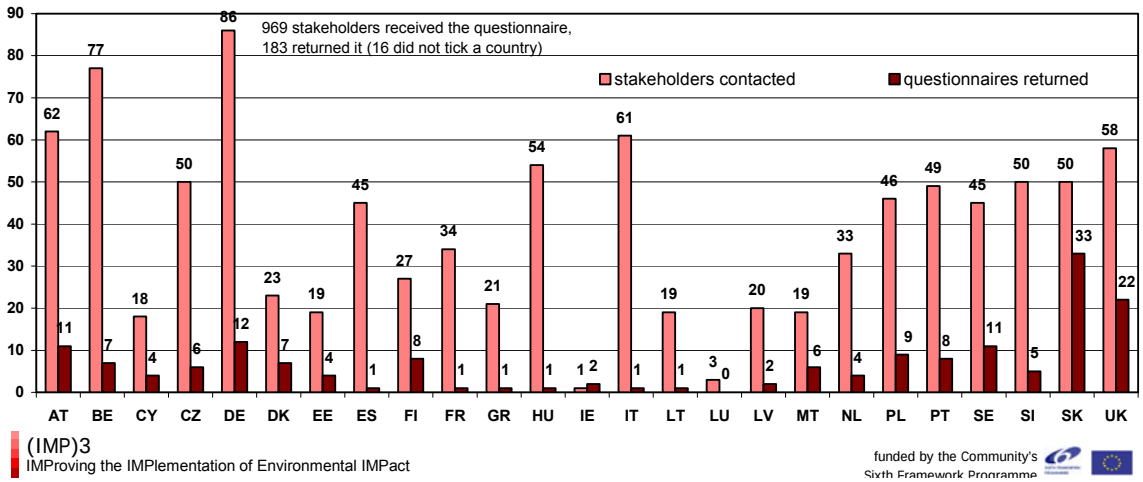
From some Member States just one completed questionnaire has been returned (Estonia, France, Greece, Hungary, Italy, Lithuania) and there was no response from Luxemburg. So Slovakia and the UK are four and three times 'over-represented' in terms of respondents while Estonia, France, Greece, Hungary, Italy, Lithuania, Ireland, Luxembourg and Latvia are 'under-represented' by a similar factor.

Statistical analysis – response rates per country	
Total no. of questionnaire respondents	183
Mean no. of respondents per country	7
Median no. of respondents per country	6
Mode	1
Range	min=0 max.=33

Statistical analysis – response rates per country

Consequently, the feedback cannot be interpreted as a representative random sample of stakeholders across the EU. Furthermore, a country-by-country analysis is not possible especially for the under-represented Member States. Therefore no calculation of any numerical results beyond the analysis of frequencies and percentages is made, and verbal descriptions are mainly used. No further statistical processing of empirical data such as average values is done. However, the database gives an impression of the view of stakeholders, that are pro-actively interested in contributing to the development of the EIA-legislation.

QUESTIONNAIRES DISSEMINATED + RETURNED



Questionnaires disseminated and returned

Represented stakeholder groups

The questionnaires returned covered answers of all different stakeholder groups. The smallest group amongst the respondents are NGO's (12 respondents/6.6%), whereas the largest group are the consultants (68 respondents/37.2%). The administrative view on EIA-application (representatives from national and regional governments) is covered by 58 respondents (31.6%).

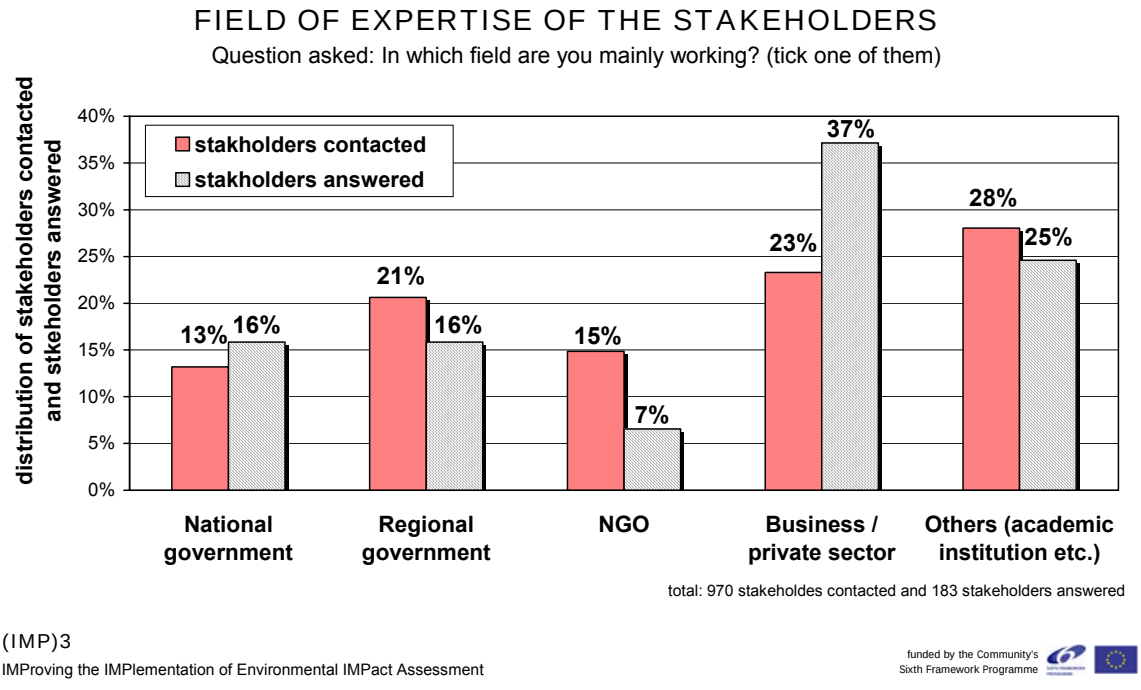
Statistical analysis – response rates per stakeholder group	
Total no. of questionnaire respondents	183
Mean no. of respondents per stakeholder group	26
Median no. of respondents per stakeholder group	26
Mode	29
Range	min=12 max.=68

Statistical analysis – response rates per country

The comparison of the frequency distribution of the stakeholders contacted with the frequency distribution of the stakeholders who answered, the business sector (consultants) is over-represented whereas the NGO's are under-represented. However, as the database was not a random sample of EIA stakeholders across the EU, statistical analysis and interpretations going beyond a calculation of frequencies and percentages were avoided.

stakeholders contacted via questionnaires and stakeholders who answered				
	stakeholders contacted		stakeholders answered	
stakeholder type	number	percent	number	percent
National government	128	13.2%	29	15.8%
Regional government	200	20.6%	29	15.8%
NGO	144	14.8%	12	6.6%
consultants	226	23.3%	68	37.2%
scientists and other proponents	272	28.0%	45	24.6%
Total	970	100.0%	183	100.0%

Stakeholders contacted via questionnaires and stakeholders who answered



Field of expertise of the stakeholders

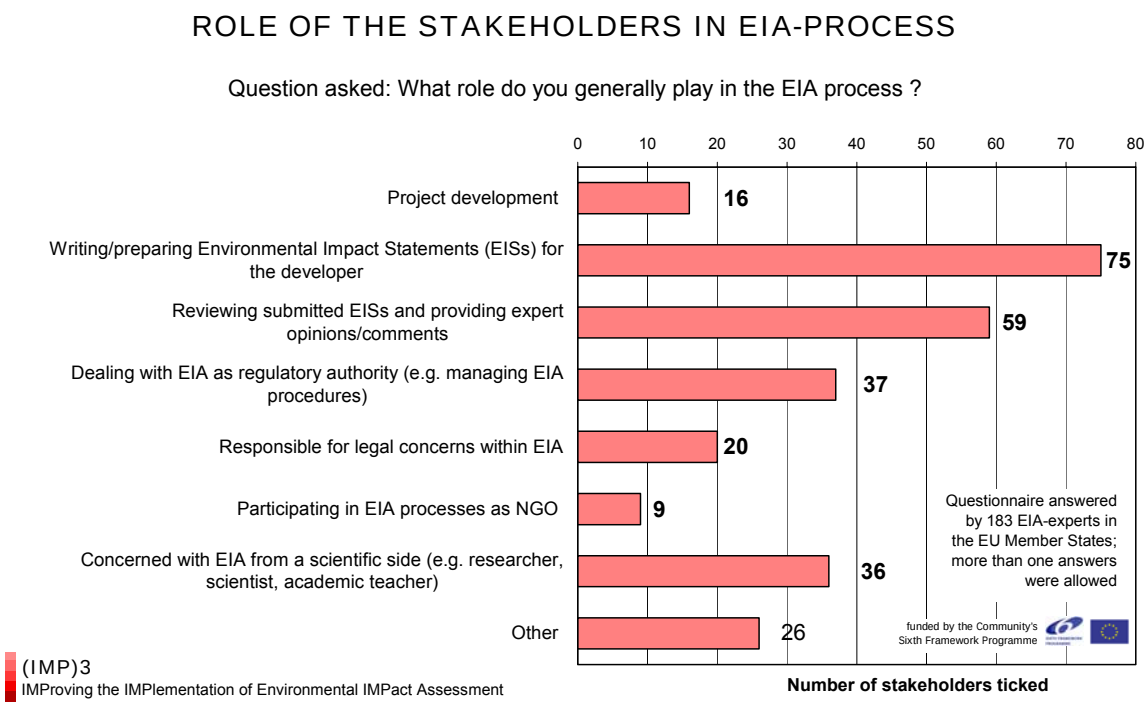
Role of the stakeholders in the EIA-process

The stakeholders responding to the questionnaire are involved in the EIA-process from very different sides[3]: 75 respondents are writing or preparing environmental impact statements (EIS) for the developer and another 16 are involved in the development of projects, both groups mirroring their experience with EIAs mainly from the proponents' side.

59 persons are reviewing submitted EISs and providing expert opinions/comments on EIS, additionally 37 ticked the category "dealing with EIA as regulatory authority". Both groups represent the views from the administrative side.

[3] As one person can be involved in the EIA-process in different roles, more than one answer was allowed. So the sum of the options ticked (278) outweighs the number of questionnaires returned (183).

Nine respondents to the questionnaire were involved in EIAs representing the position of a NGO. 36 are concerned with EIA from a scientific side (e.g. researcher, scientist, academic teacher).



Role of the stakeholders in the EIA-process

Statistical analysis – "Role of the stakeholders in EIA-process"	
Total no. of questionnaire respondents	183
Total no. of answers ticked	278
Mean no. of respondents per stakeholder group	35
Median no. of respondents per stakeholder group	31
Range	min=9 max.=75

Statistical analysis – Role of the stakeholders in EIA-process

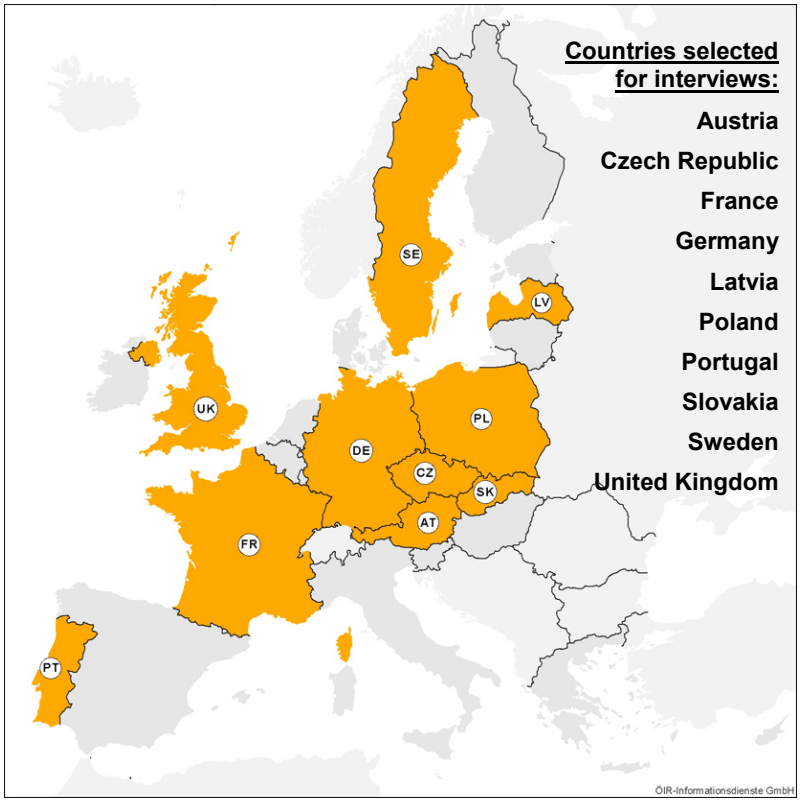
Interviews

In order to get a more detailed image of the application of EIA, interviews with selected EIA-stakeholders were conducted. This approach leads to more profound insights into the actual day-to-day difficulties in EIA implementation and a more thorough picture of which methods are in use and the pros and cons of different methods, especially because the interviewees can provide information going beyond the information gained by the very formal structure of the questionnaire. The selection of the interviewees followed two different sets of criteria: a geographical one and a stakeholder-oriented one.

Geographical criteria for the selection of the interviewees

As the results of the interviews should reflect the European situation the following criteria were taken into account:

- interviewees from new European Member States and old European Member States
- interviewees from large MS and small MS
- interviewees from MS from the southern, the northern, the eastern and the western part of the EU



Geographic distribution of the countries selected for interviews

In order to compare the EIA-application in Europe with the way countries outside Europe apply EIAs, additionally to the 10 European countries selected, two non-EU foreign countries were chosen for a more detailed investigation of their EIA application. The two selected countries are USA and Canada because of their similar conditions as highly industrialised countries and their long experience with EIA. (The National Environmental Policy Act of 1969 enacted by the Congress of the United States of America in 1969 was worldwide the first law coming up with the term “environmental impact assessment“ on a legal basis.)

Within each thematic issue several additional interviews with senior experts interviews were conducted including experts from countries additional to the ones mentioned above as e.g. Denmark, Finland and Ireland.

Stakeholder-oriented criteria for the selection of the interviewees

The EIA-experts interviewed should form a comprehensive picture of the EIA-application in each of the countries selected. Thus the views of experts at national and regional level being mainly involved in the transformation of the EU-Directive into national or regional legislation should be taken into account as well as the views of persons actually dealing with projects subject to EIAs, as e.g. consultants, NGOs or representatives from the administrative side. Thus, the following EIA-stakeholder-groups have been taken into account for selection:

- representatives of national governments,
- regional bodies with competence in EIA-issues,
- NGO's,
- representatives of the private sector as e.g. consultants,
- others as e.g. researchers.

Interview guide and protocols

In order to prepare the interviews, an interview-guide has been developed by the (IMP)3 consortium and discussed with representatives of DG Environment. All in all, 50 interviews with 64 interviewees have been conducted (33 interviews in European countries and an additional 17 in USA and Canada). Each of the interviews was minuted in order to gain a well-structured basis for the analysis.

Number of EIA stakeholders interviewed

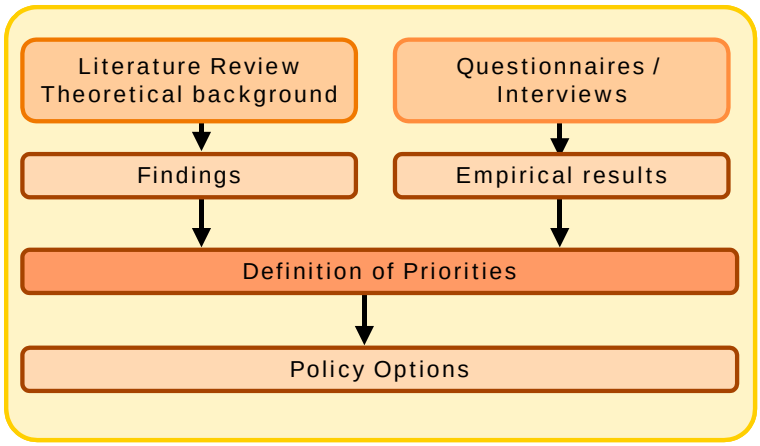
Role of stakeholders in the EIA-process

EIA-stakeholders interviewed						
Country	Stakeholder type					
	national government	regional government	NGO	consultant	others (e.g. scientists)	total
Austria	1	4	0	2	0	7
Czech Republic	2		1	2		5
Germany		2		1	1	4
France	1			1	1	3
Latvia	2					2
Poland	2					2
Portugal	1	1	1	1	1	5
Sweden	1	1	1	1		4
Slovakia	1		1	1	1	4
United Kingdom		1		1		2
Canada	2	2		3	1	8
USA	13	3	2			18
total	26	14	6	13	5	64

Number of interviewees per country and stakeholder type

1.2.4 Policy options and SWOT-Analysis

Based on the findings of the literature review, the analysis of the questionnaire and the interview results several policy options were elaborated within each of the three main themes of (IMP)3 (human health, risk assessment and projects subject to EIA) to increase the consistency of the application of EIA across the European Union.



Deduction of policy options from the results of the analysis conducted

The policy options aim at tackling the identified weaknesses of the current European EIA practice overcoming the most important barriers on the way forward. They also attempt to build on and advance the strengths that partly exist.

The policy options represent a range of different courses of actions that the European Commission could take to better exploit the full potential of EIA to act as an effective instrument of preventive

and precautionary environmental protection. The variety of the options comprises the whole range of potential measures that could be taken into account at the European level. This includes both "soft" and legislative courses of action. They are designed to operate mainly along three major axes:

- guidance;
- supportive measures;
- regulatory or legislative measures.

The development of such a range of policy options, as opposed to a simple list of recommendations, is a more robust approach as it recognizes that different levels of action are possible and that each has advantages and disadvantages.

The policy options presented in the report are addressed to the European Commission. Yet, eventually they are targeted at Member States and EIA stakeholders and are intended to influence actual implementation and application of EIA on national and regional level. Their main functions are to provide decision support to the policy making process on Community level, to assist informed decision-making on possible future amendments to European legislation, and to contribute to improvement of guidance such as supportive measures for EIA application, but also to stimulate discussions within the European EIA community.

For each policy option, a SWOT-Analysis has been conducted, which provides indicative lists of strengths and weaknesses, opportunities and threats. This form of a SWOT-Analysis is a simple, yet flexible and robust tool for decision-support that is meant as a basis for discussion outlining potential pros and cons of a decision. However, it can not substitute a more rigid cost-benefit-risk analysis to be done on part of the Commission.

1.2.5 Communication process at EU level

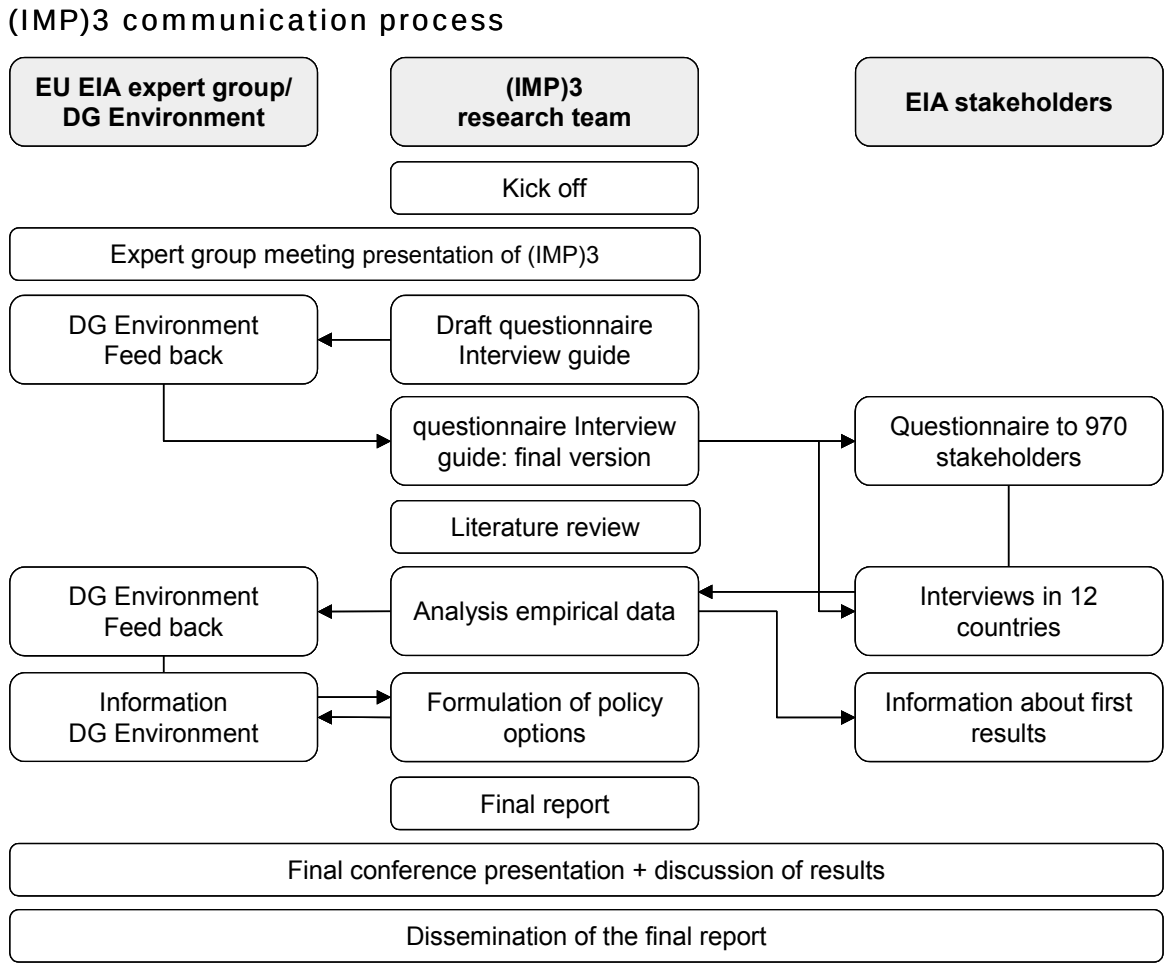
As the results of (IMP)3 shall serve for a more harmonized application of the EIA-Directive and take into account various policy options possibly being taken at European level, a close communication with relevant stakeholders at EU-level was required. Therefore, a communication process with representatives of DG Environment and the EIA/SEA expert group and DG Research was established, in order to feed back the research approach and the intermediate results with relevant stakeholders at EU-level.

SEA/EIA Expert Group

The national experts on SEA and EIA on governmental level (= SEA/EIA Expert Group) meet twice a year in order to discuss relevant issues about EIA and SEA on the European level. The meeting is chaired by a member of DG Environment.

This group of experts was informed at the start of the project about the research focus and their remarks on the research topic were taken into account at the elaboration of the details of the research of (IMP)3. Moreover, some of the group-members supported the (IMP)3-team in order to find relevant EIA-stakeholders at the national level. Intermediate results of the data-analysis were

presented to the SEA/EIA Expert Group and the final results will be presented and discussed at upcoming meetings.



(IMP)3 communication process with EIA-stakeholders at EU-level

DG Environment

In order to ensure the usability of the results of (IMP)3, serving as input for the policy making process on the European level, members of DG Environment were informed about the work plan and the progress of the project and their feed-back was incorporated into the next steps of (IMP)3. The following formal contacts were established:

- 1st co-ordination meeting at the start of (IMP)3: general information about the project and fine-tuning of the research focus of (IMP)3;
- 2nd co-ordination meeting: presentation of the draft questionnaire and the draft interview guide;
- 3rd co-ordination meeting: presentation of first results of the analysis of the empirical data coming from the questionnaire and the interviews, agreement about the form of the results of (IMP)3 (elaboration of several policy options including a SWOT-Analysis for each option); and
- pre-information about the policy options proposed by (IMP)3.

The close contact with DG Environment aimed to ensure that the results of (IMP)3 are a useful contribution to the policy making process of DG Environment concerning the improvement of EIA-application.

1.3 Contribution to policy developments

(IMP)3 goes in line with the European policy to establish a sustainable development, which is laid down e.g. in the Sixth Environment Action Programme of the European Community *"Environment 2010: Our future, Our choice"* and the European Spatial Development Perspective (ESDP).

The main goal of (IMP)3 to contribute to the process of a more harmonized application of EIAs meets directly the scientific and technological needs of the policies of the Community related to the application of the EIA-Directive (97/11/EC). In detail (IMP)3:

- provides a better understanding of "impacts" and clarifies different interpretations of environment, health, vulnerability, and risks within EU 25;
- provides a better understanding of EIA applications;
- analyses the improvement of the coherence of EIA with different assessment tools (health impact assessment etc.); and
- gives proposals for the integration of health aspects into EIA, how to come to a risk characterisation and suggestions for improving the coverage of projects types likely to have adverse effects on the environment.

Setting up policy options in the three core fields of the research human health, risk assessment and project types, (IMP)3 contributes directly to the scientific and technological needs of the policies of the Community in terms of the improvement of the application of the EIA.

2 HEALTH ASPECTS IN EIA

2.1 Theoretical and Legal Background

The human health and environmental impacts of development projects ranging from nuclear power stations and landfills to large housing estates and mobile phone base stations have generated growing public concern across the European Union (EU). Policy and decision-makers at EU, national and local levels are facing increasing pressure and protest against the siting of such projects near existing communities. This pressure and protest has fed into three strands of work. Firstly, it has led to research and evaluation that has highlighted the weaknesses of current environmental impact assessment (EIA) legislation and practice to deal adequately with the human health impacts of projects. Secondly, it has led to the use and development of quantitative health risk assessment either within or alongside EIA. Lastly, it has led to the growth of health impact assessment (HIA) as a separate and distinct form of impact assessment theory and practice, albeit one with roots in EIA.

It is at the intersection of these three strands of thinking that the differences and tensions about health and EIA come to the fore. Among the questions at the heart of this debate are:

a. should health be integrated into EIA or should it be dealt with separately?

b. if health should be integrated then what form should that integration take, in terms of the process and content of EIAs?

c. what methodologies and methods are needed to adequately assess health impacts?

And, in particular,

d. should these health impacts be assessed in largely quantitative or qualitative ways, or both,? Still relating to the method, should community experiences and knowledge be incorporated into impact assessments and, if so, how could or should it be done?

Although national and EU policies in the past few decades have led to steady improvement in the quality of the environment in Member States (MSs) much remains to be done since pressures on the environment, and in turn on human health, are continuing to increase. Consequently, there is a demand to better integrate environmental and health matters into planning and decision-making on every issue and in every sector. There are calls for a more holistic and comprehensive approach to environment and health issues with the precaution and prevention of risk being more central to environmental and health policy and decision-making.

The EIA Directive does not specifically require human health to be examined as part of the assessment process. It only refers to the need to identify, describe and assess the direct and indirect effects on, amongst other things, human beings [article 3].

The more recently published Sixth EU Environment Action Programme – Environment 2010: Our Future, Our Choice (Commission of the European Communities 2001a), on the other hand, stresses that a clean and healthy environment is vital to the quality of life, both for present and future generations, adopting the WHO's definition of health ("a state of complete physical, mental, and social well-being and not merely the absence of disease").

2.1.1 Basic Concepts

Health is not a straightforward concept. Besides having evolved over time, following increasing knowledge about the way human beings function as well as the range of factors directly and indirectly affecting health in a given moment – the so called *determinants of health* – there are still different approaches to the concept of Health, pertaining to different definitions of the term and thus to different health assessing methods.

Among existing theoretical approaches towards human health, the *Medical*, the *Holistic* and the *Wellness* or *Social* Health Models are of particular relevance to the present research. The *medical model* considers health as the absence of disease and the presence of high levels of normal physical functioning. The *holistic model* also considers the mental and social components of human health, besides physical well-being. It adopts, in this sense, the WHO's definition of human health, which is of "*a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity"*. The *social model* refers to human health in terms of the capacity to fulfil objectives, satisfy needs and be able to cope with the environment around. It is a more theoretical and difficult-to-use model than the holistic model, even though acknowledging more than one physical (physiological) dimension for human health.

Moreover, the concepts of *health* and *health determinants* are quite exchangeable. We can conceive a healthy person as someone physically and mentally sound and living a *good* social life (what ever "good" may stand for…). However, this person's health will strongly depend on his/her living in a healthy environment!

Furthermore, these general conceptualizations of health led to the concepts of *environmental health, health impact assessment (HIA)* and *Health Risk Assessment* (HRA).

Environmental health includes both the direct pathological effects of chemicals, radiation, biological agents on health and well-being, and the effects often indirect of the broader physical, psychological, social and aesthetic environment (housing, urban development, land use and transportation, … included) (WHO 1989).

There are a number of definitions for health impact assessment (HIA). The key one developed by WHO (1999), in order to create a common understanding of HIA, is known as the Gothenburg consensus paper. The main conclusions of the Gothenburg consensus paper were that:

- Health impacts are the overall effects, direct or indirect, of a policy, strategy, programme or project on the health of population.
- HIA is a combination of procedures, methods and tools by which a policy, program or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population.

Health Risk Assessment (HRA), on its turn, is defined as the quantitative evaluation of the environmental health risks resulting from exposure to a chemical or physical agent (pollutant). It is a more specific and narrower form of health assessment than HIA, once HIA can include qualitative as well as quantitative information and evidence. Therefore, health risk assessment can be part of a wider HIA but HIA cannot form a part of health risk assessment.

2.1.2 Health in the context of Environmental Impact Assessment

A prerequisite for the existence and development of good practice to including human health issues in EIA is that health is indeed perceived as a subject of environmental impact assessment. One important starting point for this good practice to develop is the existence of legislation that clearly defines human health, emphasizes the importance of assessing human health impacts and explicitly asks for its assessment within EIA.

Table1 provides a summary of the key findings among fifteen Member States, the international comparator countries and the EU in relation to EIA legislation and health.

At national level, the definition of human health in legislation and guidelines varies and tends to be quite unspecific and vague. The results show that a majority of the 13 countries studied, include, some kind of reference to impacts on humans or on human health (or related concepts) in their EIA legislation. This is done either separately or when defining concepts such as “environmental impact“ (e.g. Canada and Latvia) or setting the scope for assessment (e.g. Czech Republic and Poland).

There is also a variety of approaches. Even if the concept of *human health* prevails, other related concepts may be used, such as *health*, *public health* (Czech Republic), *affected population* (Portugal, Slovakia, UK), *humans* or *impacts on human beings* (Austria, Germany, Ireland) and *impacts on the health of the inhabitants*.

In some of the national EIA legislations human health is more closely defined and in some not at all. In most legislations human health refers to the environmental risks to health, e.g. the health impacts coming from noise, vibration, pollution, odours, etc. Examples of legislation that includes a broader definition of human health, including also economic or social impacts, are from the US, Canada, Slovakia and Czech Republic.

2.1.3 EIA Guidance

Existing legislation is an important base for practice in relation to the way that human health is considered in projects. Another important prerequisite is provided by the existence of guidance of how to include human health in EIA or of how to conduct HIA separately or as part of EIA.

A range of reports and books providing guidance exists that are linked to the EU, the national contexts and also to the general international context. However, looking at the national level among the EU countries, the results are daunting. It appears that only a few countries have national guidelines on how to assess health and social impacts within EIA. Taking all guidances into consideration and looking at the scope and definition of health in this guidance, there is a variety from risk assessment to the broader HIA approaches. In certain instances they focus on checklists and in others also on procedural issues, some are developed for a special sector or even for a certain type of development projects. The overall approach can be both qualitative and quantitative.

Table 1 EIA legislation and supporting guidance analysis

Country	Reference to human health in EIA legislation and/or supporting legislation**	Reference to physico-chemical health impacts (exposure to pollutants)	Reference to wider determinants of health and/or socio-economic impacts	Reference to precaution and/or precautionary principle	Linkage of environment and human health*
EU	✓				
Austria (AT)	✓	✓			
Czech Republic (CZ)	✓		✓		
France (FR)	✓			✓	
Germany (DE)					
Ireland (IE)	✓	✓			✓
Latvia (LV)	✓	✓			✓
Poland (PL)	✓	✓			
Portugal (PT)	✓				
Slovakia (SK)	✓	✓	✓		
Sweden (SE)	✓	✓			✓
United Kingdom (UK)	✓	✓			✓
Canada (CA)	✓		✓	✓	✓
USA (US)	✓		✓		✓

*** a statement to the effect that a project has environmental effects which affect human health as well as flora and fauna as opposed to one which states that a project has effects on health and effects on the environment i.e. that human beings are part of the environment and that human health and the environment are connected and interlinked.**

**** besides human health a number of different concepts are used in the legislations, e.g.: health, public health, impact on affected population, effects on humans, impacts on human beings and impacts on the health of the inhabitants.**

2.1.4 Results from previous evaluation studies

The present research builds on the results from previous EIA evaluation studies, at EU, country and international level.

Regarding the European Union level, the 5-year Report from the EU Commission (Commission of the European Communities 2003) concluded that health issues are still not a particularly strong feature in EIA practice, in spite of the great majority of stakeholders addressed being favourable to a more adequate treatment of human health impacts within EIA procedures.

The Report accounted for considerable variation in the coverage of health issues. Main findings were that human health definitions range from a narrow interpretation where only the health impacts of noise, air vibration and so on are assessed, to a wider one where well-being and socioeconomic effects are also included. Besides, there was "*some evidence to suggest that health impacts are considered under other headings such as pollution or risk*".

At country level, research showed an inadequate coverage of human health issues in EIA (e.g. Finland, Germany and Sweden), either because EIA practitioners lack an inadequate educational background to deal with health issues, because there is lack of practical guidance or due to a narrow notion of human health, usually ignoring its social and psychological dimensions.

At international level, a report drawing on Canadian and international experiences (Davies & Sadler, 1997), pointed out that, beyond general requirements for the potential health effects to be considered as a part of EIA, there was relatively little guidance material available. Nevertheless, the report represents the WHO Regional Office for Europe's nine-step process for integrating health into EIA, outlining the steps to be taken and a summary of limits and constraints on their application.

2.1.5 EIA and health literature

The majority of the literature reviewed for this study clearly acknowledged the need to integrate human health into EIA. However, very few examples of how health could be integrated into EIA were identified, as most of the literature referred mainly to the obstacles and challenges to including human health aspects of EIA. These include very different types of barriers, from technical, practical, political to economic ones.

Besides insufficient legal requirements to include human health issues in EIAs, main barriers identified in the literature review (Alenius, 2001; Cherp, 2002; Dora, 2004; Fehr *et al*., 2004; Franssen *et al*., 2002; Kemm, 2004; Lieskovská & Palúchová, 2004; Turnbull, 1992; Utzinger *et al.*, 2005) were:

- analytical complexity of health assessments,
- Lack of reliable and comprehensive baseline data,
- Lack of standardized and agreed-upon methods,

- Insufficient coordination between EIA and health practitioners and authorities,
- Time and cost,
- Tendency to avoid presenting health data in EISs by the proponent, and
- Health impacts assessment's results difficult to present and discuss with the target population.

The analytical complexity of health impact assessment techniques is, in fact, a strong deterrent to the broader inclusion of health impact assessments in EIA. Health impacts are often indirect or cumulative, which makes the prediction of health impacts extremely difficult. Lack of reliable and comprehensive baseline data, as well as standardized and agreed-upon methods, lead to great uncertainty at the evaluation stage of any EIA procedure and thus to the need for professional and specialized know-how. However, human health experts usually do not work well in multidisciplinary and interdisciplinary EIA teams. Besides opposing or antagonistic perspectives between health and environmental professionals, public health authorities do not have an active role, especially in what concerns the initial scoping phase and, when they do, they do not have the desired influence on the final decision.

Further, such highly technical and know-how requirements lead to longer and more expensive EIA procedures when health impacts are (adequately) addressed within EIA.

Health impact assessments results are also difficult to understand by the majority of the population and, thus, politically difficult to handle. Public discussion of health issues may also lead to the need to assess perceived risks, even if not statistically significant.

Additionally, project proponents do not like to see pollutant emissions and expected effects in the EIA final Report. This means there is usually an economic disincentive for consultants to include health impact assessments in EIA procedures.

Those that suggest a way forward to enhance the integration of health aspects in EIA argue for:

- A clearer reference to human health within EIA legislation and guidance,
- A consideration of the whole range of health determinants, the coverage of positive and negative health impacts and the differential impacts on population subgroups,
- To build systems with existing health systems so that they can provide detailed baseline health data for local populations,
- Raising the awareness of environment and health institutions and professionals about the links between environmental impact and health impacts and the wider determinants of health. There also needs for a greater awareness of EIA and HIA in both sectors,
- Methodologies and tools that can provide accurate and precise measures of health impacts need to be developed (Cole *et al,* 2004; Commission of the European Communities 2003; Dora, 2004),
- To co-ordinate and conduct EIA processes (who, when, how) from the point of view that human health information and professionals are adequately included.

2.2 Empirical Evidence and Key Findings

2.2.1 General Findings

Desk research findings were supported by questionnaire and interview results.

There was general agreement among respondents and interviewees that EIAs did cover human health issues in their respective countries. However, according to most EIA stakeholders, prime health issues covered are the environmental risks to health (such as air, water, soil and noise pollution).

Health impacts of pollutant emissions and the pathways by which they act are most often and fully considered within EIA with less consideration given to psychological and social factors. Depending on the region and the project, social, economic and well-being can be assessed within EIA but these are much less often considered and not as a matter of routine. Impacts on recreational areas, employment opportunities and effects on the local economy are considered within EIA but impacts on educational opportunities, social capital and cohesion, and the widening of health inequalities are seldom considered.

To a bigger or lesser extent, human health impacts are assessed through the use of quantitative techniques and evaluated according to legally set pollution thresholds. In the majority of countries, specific types of transport, infrastructure and industrial projects, such as rail, road, waste incinerators and nuclear power stations, are the focus for more in-depth health risk assessments.

Even when other health impacts besides environmental risks to health are included in EIAs, pollutant emissions to the air, soil and water have greater influence on the final design of the projects, than health impacts related to visual amenity or access to key services and health. In fact, very few respondents felt that social inequalities and access to services could have an influence over project design.

On the other hand, in most MSs there seems to be no separate health assessment process examining projects' impacts on communities. When there is, usually it is conducted within specific licensing procedures – mainly for industrial project types – such as IPPC, waste licensing and occupational health and safety processes.

A significant minority of the respondents within different stakeholder groups addressed from all MS, stand for a deeper inclusion of human health issues in EIA procedures, understood in a broader sense, such as physical, mental and social well-being and not just the environmental risks to human health.

A range of barriers were highlighted by Member State questionnaire respondents and interviewees to assessing human health within EIA. Lack or insufficient guidance on how to consider health issues in EIA, insufficient knowledge and understanding of health and health determinants, inadequate human health definition and non-legal obligation in national EIA legislations to include human health issues, lack of health experts in EIA teams due to different technical and theoretical approaches among EIA consultants and health professionals, lack of clear guidance indicating that

(and which) health issues should be included in EIAs and increased duration and cost of EIA procedures were the main barriers mentioned by a significant majority of the respondents. The range of barriers mentioned was also fairly similar across all Member States.

Main barriers to the deeper inclusion of health issues pointed out by most interviewees were time and cost, lack of HIA capacity, lack of baseline health data, lack of knowledge, lack of institutional and professional co-ordination and co-operation, lack of robust methods to assess health impacts, lack of research evidence for health impacts, public involvement and inadequate EIA frameworks at EU and Member State levels.

Furthermore, while a majority of interviewees could point to some good practice case studies where health aspects were well considered in EIAs only a minority of questionnaire respondents were able to do so, which implies that there are few good practice case studies where human health has been adequately assessed within EIA.

2.2.2 Discussion

There is significant overlap between the themes emerging from the desk study and key findings of the empirical study.

Although some Member States do explicitly state that human health should be considered in EIAs and implicitly define health within legislation to encompass economic, social, nuisance as well as mental and well-being impacts these have not yet translated well into EIA practice. This highlights the indirect and complex ways in which legislation actually affects and changes local level practice. The influence of legislation is rarely quick, direct and as intended.

Similarly, of the EIA guidance reviewed, there was a diversity of emphases and explicitness in the need to include and assess the human health effects of projects. This is likely to reflect the fact that these documents were advisory and so the degree to which this advice was acted upon is dependent on the interest and motivation of EIA stakeholders within each of the Member States.

There seems to persist

- a continuing refrain of the lack of adequate methods and baseline data,
- lack of institutional capacity and partnership working,
- lack of explicit statements on the importance of assessing health within EIA in national legislations,
- still significant resistance by project proponents in assessing health impacts, either from little awareness of the important role played by health issues in EIAs, or due to the implied financial and political costs.

More than a decade after the amendment to the EIA Directive these complaints and criticisms are still with us.

However, there are signs that small but significant shifts have occurred in most Member States. A significant minority of EIA stakeholders in each of them recognises and acknowledges the importance of human health and the need to assess not just the environmental risks to health but the wider social determinants and the mental, social and well-being impacts. There are also signs that human health within EIAs is being assessed but the majority of these either tend to be detailed health risk assessments of emissions into the air, water and soil or are separate HIAs undertaken after the EIA has already been completed. The questionnaire and interviews also give a picture that there already exists, to a certain extent, a political and more practical momentum in relation to promoting inclusion of human health in EIA. Legislation and ministerial orders are being prepared, professional networks are being created and education and training are conducted. The question is whether it is enough to rely on this momentum?

Both the literature review and the desk study show that there is considerable recognition that the assessment of human health is a part of EIA. This is manifested in the EIA legislations, guidelines and in the professional EIA practice. There was almost unanimous agreement among the interviewees in (IMP)3 that, wherever possible, human health impacts of a project should be assessed within an EIA rather than through a separate HIA. The difference emerges in where the boundaries are set on what health impacts are to be assessed. There are however a small but significant number of EIA stakeholders who feel that separate HIAs after an EIA is done is the best way forward.

The EIA practice and discourse so far imply that the main option, in relation to impacts on human health, is to include these as part of the EIA implementation.

The question of integration though is embedded in a larger question. This concerns the current state of the overall EU and national legislative and professional practice picture in relation to how human health is treated in the planning and approval processes of development projects. Are human health issues and impacts dealt with in the realms of other environmental or human health legislations or not? The results from the five-year report from the Commission (Commission of the European Communities 2003) indicated that human health issues are partly covered by other legislation. Considering the wider picture makes it appropriate to not only explore the integration into EIA option but to also explore the option of not integrating human health issues in EIA.

There are several arguments supporting the inclusion of human health issues in the EIA process (Health Canada 1999). Integration of health into EIA provides better possibilities to address public concerns of the development project as the public's main concern about projects is frequently related to health, well-being and the quality of life. On the other hand, integrating health assessment into EIA ensures that decision-makers obtain concurrent information on economic, social and health issues, instead of waiting for a set of consecutive assessments on the various aspects of a project which would be both time-consuming and costly. Besides, legislation and guidelines focusing on the need to assess human health issues within EIA, as well as professional networks setting and training are already in place and could be used for improvement.

Including human health considerations in EIA may also be more cost-effective than the eventual costs on society for provision of curative and treatment services because health effects were not previously foreseen and assessed adequately. Early identification of negative impacts on human

health, before a project is implemented, allows for these impacts to be eliminated or mitigated through changes to the design of the project.

Lastly, addressing health concerns together with other social, environmental and economic issues supports the concept of sustainable development.

The benefits of including health impacts in EIA vary depending on the subject of the assessment and its physical and institutional setting. Not all EIAs need or ought to encompass health effects, but there is a strong argument that all initial scoping procedures should examine the possibility that the project under review might have an impact on health (Turnbull, 1992).

On the other hand, one of the main arguments supporting separate and independent HIA procedures is that it provides for more thorough and complete analysis of health impacts, given the analytical complexity of this kind of assessment. Furthermore, health impact assessments are also difficult to present and discuss, which means their inclusion in EIA procedures could lead to a more time-consuming and politically costly public discussion of a given EIS. Even if human health issues were adequately addressed, extended EIA procedures could be counterproductive, due to the overload of administrative resources.

The question of whether or not to integrate health impact assessments into EIA is also one of effectiveness. Those who stand for separate health assessments argue that addressing all and every type of impact in EIA can lead to inefficient procedures. Besides, having in mind that health issues are partly covered by other (sectoral) regulations, according to the results of the five-year report of the European Commission (Commission of the European Communities, 2003), the question of including health impacts assessments in EIA we think is most appropriate to EIA pertains to which role, in promoting mitigation and prevention of human health impacts.

Maybe the indications of the low effectiveness of EIA in general (e.g. Barker & Wood, 1999; Council on Environmental Quality, 1997; Emmelin & Lerman, 2004; Hokkanen, 2001; Hilding-Rydevik, 2001; Hilding-Rydevik, 2005; Stenstadvold, 2001; Wallentinus & Päiviö, 2001; Wood, 1999) and that there still exist problems among EU member countries with the conformity of national measures and the existence of bad application of the EIA Directive (Commission of the European Communities, 2003) point at a direction where human health issues should be assessed separately.

For the sake of the discussion one could argue for a solution that clearly narrows down the range of health issues included in EIA. At the same time the regulation and promotion of a separate HIA process could be launched, encompassing a HIA process with a broad human health definition.

EIA may not be the only relevant context and tool for promoting and integrating human health issues in project planning. There is always the risk of overburdening EIA with too many issues and expectations as regards outcomes – outcomes like the promotion of integration of environmental and health issues, the promotion of sustainable development and achieving implementation effectiveness (having direct impact on changes of projects or on the direction of the decisions taken).

On the other hand, if health should be integrated into EIA then how should this integration take place? The answer to this question will depend on which human health definition we choose to work with. The majority of stakeholders in Member States agree that the environmental risks to human health are well covered and that mental, social and well-being impacts are not well covered. Where they do not agree is on the need to widen and broaden the implicit definition and boundary for what is considered a health impact. There are stakeholders of all types who recognise the need to broaden the scope of what is considered in the assessment of human health impacts within EIA but, though growing, they are small in number. The results from WP2 thus show that presently a narrow range of the overall health determinants from development projects are being treated in EIA. As a basis for choosing policy options, one needs to consider the implications for EIA implementation of choosing different human health definitions. At least three different approaches can be outlined:

- EIA only cover risks to human health.
- EIA includes only human health determinants related to impacts on the environment (environmental health). The impact assessment takes into consideration the direct pathological effects of chemicals, radiation, biological agents of well-being and the often indirect effects of the broader physical, psychosocial, social and aesthetic environment, which includes housing, urban development, land use and transportation.
- EIA should be developed into Environmental and Health Impact Assessment (EHIA). This includes covering a broad range of human health determinants and, thus, implies that also economic and social impacts of the project must be described as a basis for the HIA, as it is already done in some countries.

A further question of relevance here is, what methodologies and methods are needed to adequately address health impacts within EIA? The literature and this study provide no easy or simple answer to this question. Apart from possible variations according to the type of project or the legal and administrative background of health matters, both the literature review and desk research suggest the adoption of a) both quantitative and qualitative methodologies that can be scientifically robust, b) in a form that is as legally robust as EIA in the planning system within which it is being undertaken, and c) consensually agreed upon by both health and environmental professionals and institutions both within each Member State and across the EU.

As for the role played by the community, there is already a call for more public participation but the reasons for undertaking it tend to be unclear. Public discussion in EIA may be carried out (1) just to inform local people that a project is being submitted for planning permission, (2) to be aware of the local population's general opinion about the project, (3) for the improvement of the project design from people's feedback or even (4) to get to know about how people work, the current environmental and health problems within the community, what projects have succeeded or failed in the past.

While there is general understanding and agreement about the first two reasons there is less consensus and agreement among EIA stakeholders about the value and validity of the latter two reasons for community participation and involvement.

The EIA Directive and most HIA methodologies strongly argue for the need to involve and engage with local communities. Community concerns are unlikely to be allayed if the perceived health impacts as understood by the community are not dealt with and hence any methodology that integrates human health assessment into EIA should involve local communities and take serious account of perceived health impacts. The existing literature on HIA highlights some of the key approaches to involving communities and taking into account the health impacts that they perceive and their knowledge and experience of the local area.

2.2.3 Best practice and guidelines

The answer to what constitutes *best practice* is complex, mainly for two reasons. The first is related to the idea that a so called best practice can be formulated out of the implementation context (national, regional, local etc). The second reason is related to the impossibility of $(IMP)^3$ advocating one or the other of the policy options proposed in the following section and a formulation of best practice is by necessity related to a specific policy option.

Research on how to make environmental issues an integral part of decisions and action has traditionally been perceived as a question of providing different kinds of decision-makers and agents with an adequate information base (based on the belief that a better environmental information basis, more or less automatically, will lead to more environment friendly decisions, or at least provide better possibilities to do so) in line with the planning thoughts based on instrumental rationality ("goal oriented behaviour within a means-end structured problem area" and "it tells how to best combine means to achieve ends when no preferences are attached to the means" (Sager, 2001)).

Consequently, great focus and emphasis has been put on developing and providing effective tools to measure and present environmental information (Hilding-Rydevik & Bjarnadóttir, 2005). The results from this study do however, effectively demonstrate that the barriers to inclusion are not just about a lack of information concerning human health issues in the EIA process. A whole range of other factors have been put on the table, which need to be taken into consideration for furthering how human health issues are treated in project planning and decision-making. Which of these factors that constitute the main barriers in a country specific context varies e.g. in relation to how human health issues in general are treated in legislation and professional practice in project planning and decision-making. This implies that "best practice" and guidelines for this in fact can be formulated out of context and on a general level.

One must however have in mind that this formulation may not capture all the specific country context issues that are crucial for enhancing best or good practice in a specific country context (Hilding-Rydevik & Bjarnadóttir, 2005). One can also argue that what is considered to be "good practice" in one national context may not self-evidently be good practice in another national context. What is good practice will be related to what is currently in place in a specific context. In order for the promotion of inclusion of human health issues in EIA to be effective there needs to be both EU Commission activities and regulations as Country specific activities and regulations. The country specific measures can thus target the crucial context specific barriers (assuming here that integration of human health issues are to be integrated in EIA, the arguments are however also

valid for the option of having a separate HIA process). One can thus identify good practice in different contexts ("this is what we apprehend as good in our country taking our legislation, education, data situation, etc., into account"). This practice may not however need to be best practice. By best practice we thus mean an outline of some general and ideal situation.

We include here in the *best practice* concept also capacity building aiming at the promotion of a human health perspectives in project planning and decision-making, in which EIA and HIA could be important measures.

The list below is mainly derived from the barriers identified and solutions proposed in the guidelines in this study and it thus represents a maximum list of all possible good "things" that could promote best practice in relation to impact assessment and human health in project planning and decision-making. This list is not a prescriptive list of all actions and measures that are needed in order to promote improvement of how human health issues are included in EIA. It is simply a list of all the proposed possible measures and approaches that can be derived from our results. As stated above, different measures are of more or less crucial importance depending on the implementation context.

EU level:

- EU Directive is clear on the importance of including human health in EIA, also the annexes are formulated to be relevant from a human health perspective and in relation to the human health definition chosen in the directive,
- EU Directive has a clear human health definition or/and,
- EU EIA guidance has a clear human health definition,
- EU EIA guidance includes clear instructions concerning how to include human health in EIA e.g. concerning the procedures in relation to screening case-by-case and the scoping procedure but also in relation to public participation,
- Motivation and awareness raising actions are taken in order to promote the human health perspective in planning and decision-making in general and in EIA. Since there already exists an overall policy commitment and policy targets for this at the EU level there is a good foundation to build on,
- EU Commission targets research funds for exploring the links between the overall project impacts (economic, social, environmental) and human health and for furthering methods for prediction and evaluation of human health impacts,
- EU Commission monitors the progress concerning the inclusion of human health impacts in EIA,
- Joint working between DG Environment and DG Health and Consumer Protection,
- Identification and dissemination of best practices.

National level:

- National EIA legislation is clear on the importance of including human health in EIA and the legislation is formulated also from a human health perspective
- National legislation has a clear human health definition or/and,
- National EIA guidance has a clear human health definition,
- National EIA guidance includes clear instructions concerning how to include human health in EIA, e.g. concerning the procedures in relation to screening case-by-case and the scoping procedure but also in relation to public participation,
- Improving the amount of human health experts and training in HIA,
- Human health competence is provided by consent authorities and EIA competent authorities in early consultations with proponent, the scoping phase and in the review of the EIA),
- Baseline data is provided that is useful and updated in relation to impact assessment of human health (which exact measures that are needed in each country will differ) and,
- Actions are taken in order to promote the human health perspective in project planning and decision-making in general and in EIA. The existence of national human health policies and programmes is an important basis for this work,
- National research ear-marked funds for exploring the links between the overall project impacts (economic, social, environmental) and human health and for furthering methods for prediction and evaluation of human health impacts,
- Monitoring of progress in relation to how human health issues are treated in the overall context of project planning and decision-making and more specifically in EIA.

Project level EIA and professional issues:

- Human health experts are an integral part of the EIA work and the EIA team from the very beginning of the EIA work through out the whole procedure,
- EIA screening procedures are formulated and conducted also with a human health perspective,
- EIA scoping procedures are designed and conducted also with a human health perspective,
- Impact Assessment of environmental and health impacts are conducted in an cost-efficient manner in order to capture the most important human health impacts and not to over burden the EIA process and at the same time having effectiveness as a goal (to have an impact on the project planning and the decision-making),
- The EIA process is used and functions as a cooperation platform where different professions and disciplines work together with a common language,

- Citizens should be given the possibility to actively declare their views, concerns and expectations,
- Improve the awareness as regards the linkages between human–environment interaction through education and pilot projects,
- Use lay and non-technical language and avoid professional jargon. Undertake more open communication,
- Human health impacts are considered equal to other types of impacts within an EIA.

2.2.4 Monitoring progress

Lastly, attention must be drawn to the need to carry out a more detailed assessment of the primary and secondary legislation and key guidance within Member States in relation to human health and EIA. There is also the need to undertake more regular questionnaire surveys of EIA stakeholders on the health aspects in EIA to survey what changes, if any, are occurring within Member States and across the EU with regard to the adequacy of the incorporation and assessment of human health within EIA.

2.3 Policy Options

2.3.1 Introduction

Based on the findings of the desk research and the analysis of the empirical data concerning human health and EIA, this chapter presents a series of policy options, from an EU Commission point of view, that are designed to enhance the integration of human health aspects in EIA and to increase the consistency of the various approaches across the European Union.

They aim at tackling the identified weaknesses of the current European EIA practice in terms of covering human health issues and at overcoming the most important barriers. They also attempt to build on and advance the partly existing strengths.

Building on the IMP3 research results, six policy options have been developed:

- Policy option 0: Zero option: 'Do nothing'
- Policy option 1: Preparation of a new health in EIA guidance package
- Policy option 2: Supporting measures plus new health in EIA guidance package
- Policy option 3: Minor amendment to EIA Directive plus supporting measures plus new guidance package
- Policy option 4: Major amendment to EIA Directive plus supporting measures plus new guidance package
- Policy option 5: New HIA Directive Guidance plus supporting measures plus new guidance package

Each policy option is to be understood as an entire package of individual measures to be taken. These measures comprise both "soft" and legislative courses of action that are designed to operate mainly along three major axes: guidance, supporting measures, and regulatory or legislative measures.

For each policy option, a SWOT-Analysis has been conducted, which provides indicative lists of strengths and weaknesses, opportunities and threats. While this represents a solid basis for decision-support, it can not substitute a more rigid cost-benefit-risk analysis to be carried out by the Commission.

2.3.2 Option 0: Do nothing

This policy option assumes that nothing is done from a European Commission and European Union perspective. There is no further work on health and EIA issues, no new guidance, no active awareness raising measures, no new research and no changes to the EIA Directive. This policy option assumes that what is currently in place at EU level continues and that the actions taken of Member States themselves in the field of health and EIA will not be significant.

SWOT-Analysis Policy Option 0: Do nothing	
Strengths	Weaknesses
▪ No cost ▪ No additional work required ▪ Comfortable and acceptable to most Member States and the majority of EIA stakeholders ▪ No change to existing legislative, guidance and institutional frameworks ▪ There is some momentum already within many Member States	▪ Commission does not take a leadership role in this area ▪ Lack of co-ordination between Member States ▪ Take-up of best practice guidance is dependent on willingness of Member States and EIA stakeholders to act ▪ Does not put health at the forefront of impact assessment practice
Opportunities	Threats
▪ Individual countries can go their own way within bounds of Directive ▪ Member States can develop at their own pace and in a way that suits their own national circumstances	▪ No or slow progress within Member States ▪ Loss of momentum within Member States ▪ Increasing divergence of approaches between Member States ▪ Divergent approaches between Member States leads to lack of co-operation and conflict especially when dealing with transboundary and global issues ▪ Divergent progress could lead to the widening of inequalities and inequities between citizens in different Member States ▪ Practice does not change significantly across the EU ▪ Importance of human health ignored or undervalued ▪ Failure of the Commission to fulfil obligations on integrating health into policies and activities ▪ Existing guidance continues to be ignored or underused ▪ Potential of assessing health impacts within EIA not realised ▪ HIA does not develop at all or develops as a completely autonomous assessment process to EIA ▪ Lack of or fragmented and disjointed progress on key barriers especially those to improve methodology and methods

Table 2 SWOT-Analysis of Option 0: Do nothing

2.3.3 Option 1: Preparation of a new health in EIA guidance package

Option 1 would enhance the health aspects of the Commission's existing guidance on EIA by developing a new package of guidance. Currently there are four guidance documents related to EIA, each of them repeating and going over material that is in one or the other of the guidance documents. There is potential to streamline this guidance, highlight and emphasise the role of assessing health impacts within EIA, and linking this to existing EU and international best practice.

The guidance would:

- Provide explicit definitions of health, environmental health, health impacts and the determinants of health.
- Identify and describe the quantitative and qualitative methods currently in existence to assess health impacts including health risk assessment.
- Identify and provide links to good practice case studies, literature and resources.

Dissemination and awareness raising about this document will involve electronic media only via the Europe website and the websites of other public, NGO and private sector websites as well as email dissemination to key stakeholders across the EU. However this would not be one-off, but would involve regular re-disseminations to ensure that as many stakeholders as possible are aware of the new guidance.

SWOT-Analysis Policy Option 1: Preparation of a new health in EIA guidance package	
Strengths	**Weaknesses**
▪ Relatively simple and low cost ▪ Builds on what already exists ▪ Goes some way to addressing the concerns about assessing health impacts within EIA ▪ Provides an opportunity to bring together, review and highlight best practice at EU and international levels ▪ Guidance is likely to be more easily taken up by Member States (low levels of resistance from EIA stakeholders) ▪ Commission takes a leadership role ▪ There is some momentum already within many Member States	▪ Commission's leadership role is minimal ▪ Continuing lack of co-ordination between Member States ▪ Take-up of new guidance is dependent on willingness and active interest of Member States and EIA stakeholders ▪ Puts health on the EIA agenda but at a minimal level and not at the forefront of impact assessment practice
Opportunities	**Threats**
▪ Member States can use the guidance to enhance their own national guidance ▪ Stakeholders within Member States can use the guidance to advocate for and improve EIA practice ▪ Member States can develop at their own pace and in a way that suits their own national circumstances	▪ No or slow progress in the majority of Member States because this is guidance only ▪ Loss of existing momentum within Member States ▪ Continuing potential for divergent progress between Member States ▪ Divergent approaches between Member States leads to lack of co-operation and conflict especially when dealing with transboundary and global issues ▪ Divergent progress could lead to widening of inequalities and inequities between citizens of different Member States ▪ Practice does not change significantly across the EU ▪ Importance of human health ignored or undervalued ▪ Failure of the Commission to fulfil obligations on integrating health into policies and activities ▪ New guidance continues to be ignored and underused ▪ Potential of adequately assessing health impacts within EIA not fully realised ▪ HIA develops as a completely autonomous assessment process ▪ Lack of or fragmented and disjointed progress on key barriers especially those to improve methodology and methods

Table 3 SWOT-Analysis of Option 1: Preparation of a new health in EIA guidance package

2.3.4 Option 2: Supporting measures plus new health in EIA guidance package

Option 2 builds on the new guidance package and passive dissemination strategy described in Option 1. It consists of the new guidance package described in Option 1 plus,

- the rejuvenation through full or part-funding of national EIA centres within Member States to act as focal points and links within and between Member States on EIA issues;
- the funding and recognition of health impact leaders or 'champions', based within national EIA centres, to promote the integration of health into EIA;
- the development and implementation of a systematic, widespread and long term awareness raising programme for environmental and health professionals from the public, private and NGO sectors about the environmental and health impacts and the links between them;
- the development and implementation of a systematic, widespread and long term training programme for environmental and health professionals from the public, private and NGO sectors on health impacts, HIA, health risk assessment and how to incorporate these into EIA;
- the development and implementation of a systematic research programme to tackle the barriers to the assessment of health impacts within EIA focussing especially on data and methodological issues;
- the co-ordination and development of national and European level health datasets that can be used at the small area level to provide a baseline for the health of communities and populations affected by development projects;
- the development of a programme of monitoring and evaluation of the implementation of the supporting measures within and between Member States; and
- the creation, co-ordination and maintenance of an online repository or library of good practice case studies of the incorporation of health into EIA along the lines of the HIA gateway, potentially as part of the programme of work of national EIA centres.

SWOT-Analysis Policy Option 2: Supporting measures plus new health in EIA guidance package	
Strengths	**Weaknesses**
▪ Builds on what already exists ▪ Goes a significant way towards addressing the majority of concerns about assessing health impacts within EIA ▪ Commission takes a significant leadership role ▪ Comprehensive package that addresses the majority of identified weaknesses ▪ Likely to be cost-effective in terms of the time, money and personnel involved and the likelihood of effecting change ▪ Supports Member States to progress and therefore likely to be taken up by most stakeholders ▪ Builds on and uses existing regulatory and institutional frameworks ▪ Building on existing momentum already within many Member States ▪ Less chance of divergence between Member States ▪ Strategic use of Commission programmes in DG Consumer Protection and Health and DG Environment ▪ Demonstrates joint working between Directorate Generals ▪ Systematic and co-ordinated approach ▪ Puts health on the EIA agenda at a significant level	▪ Concerted, sustained and long term effort required ▪ Long term financial, personnel and resource support needed ▪ Take-up of supporting measures and new guidance is dependent on willingness and active interest of Member States and EIA stakeholders
Opportunities	**Threats**
▪ Significant progress on health in EIA ▪ Better co-ordination between Member States ▪ Increase and enhance co-operation between EU Directorate Generals (DGs), between DGs and Member States and between Member States ▪ Member States can continue to develop at their own pace and in a way that suits their own national circumstances ▪ Goes a significant way towards realising the potential of adequately assessing health impacts within EIA ▪ Improves EIA practice significantly ▪ Improves awareness and understanding of environmental and health linkages ▪ Builds commitment and confidence to go further on health within EIA within Member States	▪ No or slow progress in the some Member States because these are supporting measures and guidance only ▪ Some continuing potential for divergent progress between those Member States who take up the guidance and support and those who do not (but less than for Options 0 and 1) ▪ Some continuing potential that divergent progress leads to widening of inequalities and inequities between citizens between those Member States who take up the guidance and support and those who do not (but less than for Options 0 and 1)

Table 4 SWOT-Analysis of Option 2: Supporting measures plus new guidance package

2.3.5 Option 3: Minor amendment to EIA Directive plus supporting measures plus new guidance package

Option 3 builds on the supporting measures and new guidance package described in Option 1 and 2.

It consists of:

- The new guidance package described in Option 1.
- The supporting measures described in Option 2.

Plus,

- a change to the wording of the current EIA Directive so that there would be an explicit reference in the main part of the Directive of the need to consider the positive and negative impacts on human health; and
- an explicit reference in the descriptive part of the Directive to a broad definition of health that incorporates the influence of the wider determinants of health, e.g. the WHO definition of human health;
- the development of a programme of monitoring and evaluating the implementation of the amendments to the Directive and change in EIA practice within and between Member States.

SWOT-Analysis Policy Option 3: Minor amendment to EIA Directive plus supporting measures plus new guidance package	
Strengths	**Weaknesses**
▪ All the strengths of Option 2 ▪ Member States obliged to take action ▪ Makes explicit what was already implicit in the Directive ▪ Will not require major changes to the EIA legislation of Member States ▪ Strong and significant demonstration of the Commission's commitment to improving the health of its citizens ▪ More consistent approach across Member States ▪ Greater progress towards Amsterdam Treaty obligations ▪ Responds to public concerns ▪ Will drive change and hence be even more effective than Options 1 and 2 at effecting change in EIA practice ▪ Puts health at the forefront of the EIA policy and practice agendas	▪ More effort and resources needed than Options 1 and 2 ▪ Will take longer to implement than Options 1 or 2
Opportunities	**Threats**
▪ All the strengths of Option 2 ▪ Deeper and more sustained progress with regard to the health aspects of EIA	▪ Some Member States and EIA stakeholders are likely to be very resistant to amending the Directive ▪ Changes to the Directive may still lead to little or no change in EIA practice within Member States

Table 5 SWOT-Analysis of Option 3: Minor amendment to EIA Directive plus supporting measures plus new guidance package

2.3.6 Option 4: Major amendment to EIA Directive plus supporting measures plus new guidance package

Option 4 builds on the directive amendments, supporting measures and new guidance package described in Option 1, 2 and 3.

It consists of:

- The new guidance package described in Option 1.
- The supporting measures describe in Option 2.
- The minor amendments described in Option 3.

Plus,

- a change to the wording of the current EIA Directive so that there would be an explicit reference in the main part of the Directive of the need to consider the determinants of health in influencing impacts on human health; and
- an explicit reference in the main part of the Directive to a broad definition of health.
- an explicit reference in the main part of the Directive to the areas that need to be considered to assess social, health and environmental equity and inequalities.
- an explicit reference in the main part of the Directive to the reporting requirements for health impacts within environmental statements.

SWOT-Analysis Policy Option 4: Major amendment to EIA Directive plus supporting measures plus new guidance package	
Strengths	Weaknesses
▪ All the strengths of Option 3 ▪ Most likely to achieve significant change in terms of integrating HIA into EIA ▪ Provide the clearest understanding of what human health means within in EIA ▪ Creates a legislative basis for health in EIA	▪ More effort and resources needed than Options 1, 2 and 3 ▪ Will take longer to implement than Options 1, 2 and 3 ▪ Will require considerable negotiation and agreement between the Member States
Opportunities	Threats
▪ Great possibilities for improving health and equity among EU citizens	▪ Many Member States and EIA stakeholders are likely to be very resistant to making major changes to the Directive ▪ Changes to the Directive may still lead to little or no change to EIA practice within Member States

Table 6 SWOT-Analysis of Option 4: Major amendment to EIA Directive plus supporting measures plus new guidance package

2.3.7 Option 5: New HIA Directive Guidance plus supporting measures plus new guidance package

There are concerns that fully integrating health assessment into EIA will overburden a process that is already long, costly and complicated. Option 5 involves the creation of a new HIA Directive.

It consists of:

- the preparation of a new and separate HIA Directive;
- the preparation of separate guidelines for HIA according to this directive;
- the development and implementation of a range of supporting measures involving awareness raising measures, training, institution building and research; and
- the development of a programme of monitoring and evaluation of the implementation of the Directive and HIA practice within and between Member States.

SWOT-Analysis Policy Option 5: New HIA Directive Guidance plus supporting measures plus new guidance package	
Strengths	**Weaknesses**
▪ Member States obliged to take action ▪ Strong and significant demonstration of the Commission's commitment to improving the health of its citizens ▪ Puts health at the forefront of the EU's and Member States' agendas ▪ Goes a significant way to addressing all of the concerns about assessing health impacts within project planning and decision-making ▪ Commission takes a significant leadership role ▪ Comprehensive package that addresses the majority of identified weaknesses ▪ Building on existing momentum already within many Member States ▪ Less chance of divergence between Member States ▪ Strategic use of Commission programmes in DG Consumer Protection and Health and DG Environment ▪ Demonstrates joint working between Directorate Generals ▪ Systematic and co-ordinated approach ▪ Puts health on the EIA agenda at a significant level	▪ More effort and resources needed than Options 1, 2, 3 and 4 ▪ Will take longer to implement than Options 1, 2, 3 and 4. ▪ Will require considerable negotiation and agreement between the Member States ▪ Does not build on what already exists like Options 1, 2, 3 and 4 Requires new institutions and frameworks ▪ Will require major changes to the legislation of Member States
Opportunities	**Threats**
▪ Greatest possibilities for improving health and equity among EU citizens ▪ Significant progress on assessing the health impacts of development projects ▪ Goes a significant way towards realising the potential of HIA	▪ Many Member States and EIA stakeholders are likely to be very resistant to making major changes to the Directive, ▪ Could create conflict and contradictions for policy and decision-makers and between EIA and HIA practitioners ▪ May overburden the project planning and decision-making procedures by introducing a separate HIA process parallel to EIA (all depending on how EIA and HIA is implemented) and thus not be cost-effective

Table 7 SWOT-Analysis of Option 5: New HIA Directive Guidance plus supporting measures plus new guidance package

3 RISK ASSESSMENT

3.1 Theoretical and legal background

EIA and **risk assessment** are based on very similar concepts and broadly have the same goals (Brookes, 2001). They both deal with the prediction of future consequences arising from human activities or planned interventions. Uncertainty about the exact nature, likelihood and magnitude of those consequences is inherent to both EIA and risk assessment (ADB, 1997). They both seek to inform decision-makers about adverse consequences and are decision-supporting tools for measures to mitigate, reduce or eliminate adverse impacts, or the risk of those impacts. Both instruments are essentially interdisciplinary, and their application involves a number of similar procedural steps.

But while EIA normally fails to adequately address the probability and the range of magnitude of adverse consequences, environmental risk assessment is in particular able to answer these two questions and to quantify risk (ADB, 1997; Kjorven, 1998). The strength of a systematic (quantitative) risk assessment, compared to mere straight-forward impact predictions, is that it can make uncertainty explicit by expressing the likelihood or frequency of an outcome and by generating a probability distribution for a range of possible outcomes of different magnitudes (Covello & Merkhofer, 1993; Kolluru, 1996). Risk assessment is particularly effective in providing a sound information basis for decision-making on risk management in situations where risk is significant, risk issues are complex, and uncertainties are large. Risk management involves developing and evaluating alternative risk management options, balancing risks against the costs and benefits of measures, and selecting and implementing the most effective risk reduction and control measures, aiming at achieving the greatest reduction of the most unacceptable risks in the most cost-efficient way (Kolluru, 1996).

The overall **objective** of the research in the field “risk assessment within EIA” of (IMP)3 is to make substantial contributions to more consistency, enhanced coverage and better integration of risk assessment in EIA practices in the European Union Member States. The focus is on **extraordinary** (abnormal, non-standard, non-routine) **hazards** and **risks** that are associated to projects subject to EIA, as opposed to those effects of a project that are related to routine operating conditions. In particular, project-related risks due to the following hazard categories are examined:

- natural hazards: earthquakes, floods, avalanches, landslides, heavy weather conditions etc.;
- internal accidents: accidents within the proposed project caused by technological failure, human failure (error, mismanagement, etc.), or a combination of both (man-technology interactions), including various degrees of non-standard/abnormal modes of operation (disturbances of normal operating conditions, hazardous incidents, major accidents);
- external accidents: exposure of the proposed project to accidents in other existing installations in the project environment that could affect the project;
- sabotage, including various forms of unauthorised interferences (vandalism, etc.);
- impacts of the proposed project on the hazard potential and damage potential (vulnerability) that is pre-existent in the area of project location.

In general terms, "risk" can be defined as a measure that combines the probability, or frequency, of the occurrence of a particular hazard and the magnitude of the adverse consequences or harm arising to the quality of human health or the natural and man-made environment as a result from exposure to that hazard. Risk increases as the probability, or magnitude, or both, increase. (Brookes, 2001; Calow, 1998; Kolluru, 1996; DEFRA, 2000, Crawford-Brown, 1999).

3.1.1 Risk in the context of the EIA Directive

The ***EIA Directive*** is a key instrument of European Union environmental policy. EIA shall contribute to achieving equal levels of **environmental protection and safety** of citizens across all Member States.

In principle, the concept of risk is inherent to the EIA Directive. EIA deals with the possibility of future impacts on the environment, and while the scope of the Directive does include the possibility of positive effects, in practice it focuses on potential adverse effects, which are the focus of risk assessment, too. Thus, all vital elements required by the general definition of risk are present:

- hazards (associated with the existence of a project),
- the possibility of an adverse outcome (damage or harm to man and the environment),
- uncertainty about the occurrence (likelihood) and magnitude of that adverse outcome.

Main tasks of an EIA are the prediction of the impacts that are likely to be caused by a project, an evaluation of the significance of those impacts, which involves a judgment on magnitude and probability of impacts, and the development of mitigation measures to reduce negative impacts. These are also main tasks within a risk assessment and risk management process. Furthermore, the Directive uses many risk-related terms, such as "*magnitude and complexity of the impact*", "*probability of the impact*", and "*duration, frequency and reversibility of the impact*" (Annex III.3). Therefore, the Directive itself is deeply rooted in a risk-based concept.

However, the EIA Directive mainly refers to risks under normal conditions, i.e. to impacts connected to the planned – standard or routine – operation of a project. The scope of the EIA Directive is much less clear with regard to extraordinary, or abnormal, risks, i.e. with regard to the possibility that implementation of a project might lead to significant adverse environmental consequences under exceptional circumstances, under non-routine or non-standard modes of operation, or due to any unplanned hazardous incidents. There are arguments in the Directive itself that speak for and against a wide interpretation.

So, there is much evidence that a close material interrelationship between the objectives of EIA, according to the Directive, and risk assessment exists. Article 3 and Annex IV para. 4 require EIA to assess the "*direct and indirect effects*" of a proposed project on, *inter alia*, the environment, human beings, and material assets resulting from, *inter alia*, "*the existence of the project*" and "*the emission of pollutants*". If such effects are caused by an accident within a project, e.g. by an accident leading to an unplanned release of pollutants, this may clearly be understood as a "*direct effect*". If negative impacts on the environment are caused by natural hazards or external accidents that may occur in the project environment and impact on the project, this may, at least, be understood as an "*indirect effect*", which would not have happened without the "*existence of the project*". Analogously, any environmental impact generated by sabotage or otherwise unauthorized interferences is an "*indirect effect*" of "*the existence of the project*". Thus, the Directive may be interpreted in a broad way with an obligation to consider *all* direct and indirect significant environmental effects that could arise from the implementation of a project, i.e. both impacts caused by its standard operation and such caused by extraordinary hazardous incidents.

The mere "*existence of a project*" may increase the hazard potential present at the site, either because an accident-prone project itself poses a technological hazard, or because a project is exposed to external hazards, which in case of their occurrence might in turn cause the project to release hazards into the environment. Such external hazards may either be natural hazards pre-existent at the site or man-made hazards (accidents) in other existing projects. Another mechanism through which a project could influence the hazard potential is by increasing the likelihood of

occurrence of a natural hazard. For example, construction might destabilize a slope and increase the risk of a landslide, deforestation or soil sealing might increase surface water runoff and increase the risk of flood build-up areas that may be far off, or changes to vegetation cover might increase the risk of avalanches and mudflows. If the implementation of a project increases the hazard potential of an area, this can be understood as a "*significant effect*" on man and the environment (Greiving, 2005).

Moreover, exposure of a project to an external – natural or technological – hazard increases the vulnerability of the area of the project location to that hazard. Thus, through its mere existence, a project may increase the damage potential or vulnerability of the area where it is sited. Possible environmental impacts on a project may lead to, amongst others, damage to, or destruction of the project and the injury or loss of lives of employees. Environmental impacts on the project may also cause the project itself to become a hazard to the environment and residents, i.e. the project may become a risk source and a link in a 'risk chain': external hazards impacting on the project, which in turn causes "*significant effects*" on the environment. Thereby, an increase in the damage potential would result in the increase of the hazard potential of the project location area. If the implementation of a project increases the damage potential of an area, this can also be understood as a "*significant effect*" on man and the environment (Greiving, 2005).

Annex IV.3, in accordance with Article 5 (1), requires the EIS to consider the "*aspects of the environment likely to be affected by the proposed project*." Likewise, Annex III.2 requires that "*the environmental sensitivity of geographical areas likely to be affected by projects must be considered*" in screening. Both, the changes to the hazard potential and the damage potential, can be understood as "*aspects of the environment*" and as part of "*the environmental sensitivity of geographical areas*" likely to be affected.

The material interrelationships argued above provide evidence in support of the hypothesis that the concept of 'extraordinary' risks and their consideration and assessment in EIA is within the material scope of the Directive. However, these material interrelationships are to a large extent implicitly hidden in the Directive and do seldom become manifest in explicit verbal terms.

However, close analysis of the Directives' text also reveals much evidence that the manifest and explicit scope of the Directive in terms of extraordinary risks is limited: While the Directive does not exclude consideration of extraordinary hazards, explicit reference to the consideration of risks under non-standard operation of a project, or under exceptional conditions, is restricted to Annex III.1 to the Directive. Annex III, which has been introduced with the amending Directive in 1997 (Directive 97/11/EC), lists selection criteria that are to be applied in accordance with the provisions of the screening Article 4 (3). These criteria cover the characteristics of projects, the location of projects and the characteristics of the potential impacts. Under 'characteristics of projects', the screening criteria provided by Annex III.1 include the criterion

> "*the risk of accidents, having regard in particular to substances or technologies used*."

Apart from Annex III.1, no further explicit mentioning is made of extraordinary hazards or risks in the Directive.

Besides "risk of accidents", indirectly the screening criteria listed under "location of projects" in Annex III.2 to the Directive, bear potential relevance to risk-based considerations. By stating that the "*environmental sensitivity of geographical areas likely to be affected by projects*" must be considered in screening decisions, both the hazard potential and the vulnerability of the project environment, including the damage potential present at the site and its coping capacity, are implicitly touched upon (cf. above). By listing densely "*populated areas*", the "*existing land use*" and various types of naturally sensitive areas as screening criteria, Annex III.2 may be interpreted as

making indirect reference to the exposure to hazards and to the magnitude of potential adverse consequences of a risk event occurring. However, none of these possible implicit meanings are stated explicitly in the Directive.

External impacts of the environment on the project are not mentioned explicitly in the Directive, either. These would include both natural hazards and accidents in other existing installations impacting on the proposed project. In contrast, the Canadian Environmental Assessment Act is much more explicit about that point by including "*any change to the project that may be caused by the environment*" (CEAA, 1992). Canadian guidance in EIA points out that *"potential effects of the environment on the project must be examined using the same criteria for significance as used in the assessment of effects of the project on the environment"* (CEAA, 1994). However, no such concept can be found in the EIA Directive.

The function of Annex III is to determine if an EIA is required. For that purpose, the relevant selection criteria must be considered by Member States when drawing up their legislation, i.e. in the setting of thresholds and criteria for projects subject to mandatory EIA, and/or by competent authorities when making screening decisions for Annex II projects, i.e. in deciding on the need for an EIA in case-by-case examinations. The field of application of Annex III is restricted to screening provisions or decision-making related to Annex II projects. Annex I projects, which are subject to mandatory EIA, are out of the scope of application of Annex III. An explicit obligation to apply the criterion "risk of accidents" throughout the entire EIA procedure and in particular to the identification, description and assessment of significant effects in the EIS is not present in the Directive. Thus, it may be concluded that the Directive does not require in a manifest way to consider "risk of accidents" in other stages of the EIA procedure than screening.

The concept of risk expressed in the Directive is narrow. Besides the "*risk of accidents, having regard in particular to substances or technologies used*", no other risk category is mentioned. The risk concept appears to be confined to internal accidents within the proposed project that might cause the release of chemical hazards. Evidence gathered by the (IMP)3 project supports the hypothesis that there is a tendency among Member States and stakeholders towards such a narrow interpretation. Nevertheless, the semantic meaning of the term "accidents" may also be interpreted in a much wider sense as meaning 'anything that can go wrong and might have significant effects on the environment', which would comprise various hazard categories that could affect a project, including external risk sources and sabotage. However, as neither the term "risk" nor the term "accidents" is defined or specified further in the Directive, it would appear that the European legislator has left his exact purpose largely up to discretion.

Consideration of the "*likely significant effects*" of a project, as required by Article 1.1, Article 2.1, and Annex IV. 4, is a key concept of the EIA Directive. Interpretation problems exist with regard to the issue of 'risk'. The expression "*likely*" appears to be in contradiction to the inherent nature of risks, which are characterised by uncertainty and limited likelihood of occurrence, and are thus per definition more or less "unlikely". This wording of the Directive may be seen as excluding low probability risks from assessment, irrespective of the magnitude of potential adverse consequences, and it tends to favour and justify an interpretation that defines "extraordinary risks" as being largely out of the scope of the Directive[4]. There is solid evidence provided by national implementing regulations, as well as by the last five-year review of the implementation of the EIA Directive (EC, 2003a), that there are Member States that understand and interpret the Directive in the narrow way that there is no requirement in the Directive to cover hazardous incidents that can

[4] But also a wider interpretation could reasonably be argued: the English adjective "likely" carries semantic connotations in the sense of "possible", and there are officially approved translations of the Directive's text into non-English languages that in fact use this meaning.

be rated as “unlikely”, while yet the same Member States still acknowledge that "risk of accidents" is a screening criterion.

3.1.2 EC’s guidance on EIA

In theory, EC’s guidance on EIA (2001a, 2001b, 2001c) reflects a comprehensive and wide concept of risk in the EIA context. In all three checklists, explicit references to the consideration of extraordinary risks are repeatedly made. It is recommended to consider impacts of various kinds of natural hazards and exceptional external conditions on the project, accidents and hazardous incidents during construction and operation, and exposure of projects to external accidents. Only sabotage is not mentioned explicitly. Effects of abnormal events on human health and all relevant environmental receptors should be considered and, where appropriate, quantified.

The guidance materials demonstrate that good application of the Directive should cover most of the hazard categories and risk types that are relevant during the major stages of the EIA process (screening, scoping, EIS, mitigation measures). Moreover, the guidance recommends addressing various categories of major social and economic impacts in EIA, such as changes in social structure, resettlement of people, in-migration of new residents, employment and quality of employment, etc.

3.1.3 National EIA systems

A number of different risk concepts and varying requirements for consideration of extraordinary risks in EIA are to be found in EIA legislations of the Member States, reflecting the considerable amount of discretion European EIA legislation leaves in interpreting its scope in terms of risk. Consequently, inconsistencies in coverage of risks in national EIA practices must not surprise.

Although differing types of implementation approaches exist, the majority of examined Member States have chosen to adopt the narrow risk concept and the narrow field of its application from the EIA Directive, i.e. to restrict explicit references in their EIA regulations to “risk of accidents” and to confine its application primarily to screening decisions. Apart from fulfilling that minimum requirement of the Directive, no further legal obligations to consider extraordinary risks throughout the EIA procedure, including the EIS, exist in those countries.

In some rare instances, Member States have chosen to implement more detailed or more comprehensive requirements for risk assessment into their EIA legislation, or in closely related sectoral legislation, which exceed the explicit scope of the Directive. Relevant provisions in those few Member States include:

- use of a wider risk concept in screening procedures;
- consideration of “risk of accidents” according to Annex III.1 to the Directive beyond screening, i.e. throughout the EIA process;
- definition of a wider and more detailed concept of risk beyond “risk of accidents”;
- comprehensive requirements for applying a wide risk concept in all relevant stages of the EIA process that arise from other applicable legislation related to EIA in a few Member States, but these provisions do not apply to all projects subject to EIA.

However, most of these requirements do by far not fully reflect the wide risk concept put forward in EC’s guidance (2001a, 2001b, 2001c). In many Member States, albeit not in all, national guidance on EIA makes more explicit and more extensive references to the coverage of risks in EIA than is

required by national legislation. Yet, compared to EC's guidance on EIA, very few Member States have issued recommendations that are similarly comprehensive and detailed. In this respect, the impact of EU guidance on Member States appears to have been rather limited. Moreover, practice-related specific methodical and technical guidance on how to apply risk assessment in EIA does not exist in any of the sample countries.

There are considerable **inconsistencies** in the **project-level regulatory framework** and corresponding **licensing procedures** related to risk assessment. The ways the Seveso II and IPPC Directives have been implemented in the examined Member States are highly varied and diversified. Models with a certain degree of integration of EIA procedures and IPPC/Seveso II procedures in a minority of Member States can be differentiated from prevailing models that practice separation of procedures.

In general, most risk assessments are required by legislation outside EIA, and they are applied in procedures separate from, or parallel to, EIA. Requirements for risk assessment and risk management are much stronger under Seveso II- and IPPC-related licensing regimes than in EIA procedures; in addition, many sectoral regulations for specific project types exist (e.g., for nuclear plants, contaminated sites), often with an emphasis on safety risks. In a few Member States, EIA is a dependent part of other procedures under applicable sectoral legislation; for projects that are simultaneously subject to EIA and certain subject specific regulations that require risk assessment, both an EIS and separate risk studies are submitted. In a number of countries, procedures follow a sequential order, with Seveso II and IPPC procedures subsequent to EIA and requiring the EIA permit. All mentioned models of organising procedures are associated with inconsistencies that cause coordination problems.

Discrepancies in the fields of application of the EIA, IPPC and Seveso II Directives in terms of project lists cause potential gaps in the coverage of risk-relevant projects. Discrepancies imply that certain projects are subject to only one procedure; since the field of application of the EIA directive in terms of project types is more comprehensive than that of the other two Directives, Member States that rely much on Seveso II and IPPC procedures to address hazards and risks may fail to properly examine risks of such projects that are only subject to EIA, i.e. they are in danger of failing to cover all potentially risky developments. Moreover, the material scope of the Directives is different: For example, the Seveso II Directive focuses on chemical safety hazard assessments (risk of accidents) and on response measures (accident prevention policy, emergency plans, inspections, etc.), with not much attention dedicated to the environmental consequences of an accident occurring, which is the domain of EIA. Thus, there is a need for better coordination and streamlining of procedures in order to make project-level risk assessment more efficient and to avoid gaps in the coverage of projects.

3.2 Empirical evidence and key findings

The analysis of the empirical data is based on 183 completed questionnaires returned by European EIA-stakeholders and on 50 interviews with various EIA-stakeholders in Europe, the USA and Canada. The following discussion sums up and interprets the results of the analysis that is elaborated in detail in the report "Risk Assessment and EIA".

3.2.1 Coverage of extraordinary hazards, risks and risk assessment in EIA practice

The different potential risk sources are dealt with very differently across the European Union. A considerable range of variability in coverage of most types of **extraordinary hazards** persists

across hazard categories and for the same hazard categories, both within individual Member States as well as between Member States. The EIA performance profile appears to be best with regard to natural hazards and internal technological accidents. These two risk sources are addressed more regularly than other hazard categories, albeit notable differences between countries exist. Which hazard type gets considered in EIA to what extent depends much on project types, less on project locations.

The coverage of "more likely" **technological accidents** is often a matter of routine, but it is mostly restricted to projects involving accident-prone high-risk technologies or substances and/or to certain classes of project types (chemical industries, power and incineration plants, nuclear installations, fuel storage and pipelines, etc.)., which in both cases are often subject to specific legislation outside EIA. The focus is often on safety risks; the environmental consequences of accidents are rather seldom assessed.

Different national priorities are attributed to the different types of **natural hazards**, apparently depending much on differing environmental conditions and risk perceptions. While some natural hazard types are quite often assessed (e.g., floods, landslides, seismic risks), others are very seldom an issue (e.g., forest fires, heavy weather conditions). Natural hazards are often identified prior to submission of the EIS, making use of hazard maps where existent, and avoided by choosing more suitable locations. Impacts of a project on the hazard potential pre-existent at the site were hardly mentioned.

Accidents due to human error and **exposure of projects to external accidents** are rather seldom considered. **Sabotage** is almost completely out of scope of EIA practice, even in the only sample country where a respective requirement in EIA-related legislation exists.

Some project types, although risk-relevant, were frequently felt to be missing on the EU and/or national project lists. Most applications of (formalised or quantitative) risk assessment are **human health risk assessments** related to radiation or chemical hazards, but not necessarily associated with abnormal conditions. Effects on non-human environmental receptors and ecosystem wellbeing and integrity are strongly underrepresented.

In general, even in those cases where extraordinary risks get some consideration, risk assessment is often a side issue in EIA procedures and in the EIS. Stakeholders could not identify many good practice examples for applying risk assessment in EIA.

3.2.2 Procedural and methodical aspects of risk assessment approaches in EIA

In general, in most Member States the risk assessment process within EIA tends to lack consistency and completeness, and may sometimes even appear patchy. Empirical results show that risk assessment in EIA is often much **hazard-based** and heavily oriented on **risk management approaches**. According to stakeholder responses of the questionnaire at EU-level, the two steps that are conducted most often are **hazard identification** and **mitigation measures.** This implies in formal terms that a number of analytical key steps in the stages between hazard identification and risk management are often lacking, compared to a comprehensive risk assessment that would involve analysing exposure and consequences and an evaluation and/or estimation of risk. Too often, the environmental consequences of accidents are not assessed, or only for human health effects. Not having an estimate of the probability of a hazard occurring, a prediction of the exact nature and magnitude of adverse consequences, and a judgement about the significance of a risk makes designing appropriate risk control and reduction measures and setting the right priorities among them difficult. However, there are a few Member States where data suggest a more systematic and coherent approach to a complete risk assessment process.

Public participation was perceived to be ambivalent: the public may actively point out at risks and stress the need to tackle them, but it may also complicate the scientific-technical risk assessment. A lack of public involvement should raise concerns, given the fact that public participation is a key feature of EIA, whose significance has even been strengthened with the last amendment to the EIA Directive. Involving the public in risk-related decision-making is particularly important because risk perceptions of experts, decision-makers and the public affected often are significantly different, and because evaluation of the significance of a risk entails value judgments and touches on social, cultural, and political factors (Covello, 1998). Risk-related issues are usually highly sensitive to the ones who feel affected. A lack of involvement of the public can lead to distrust and threaten the acceptance of projects.

With some exceptions, an **assessment of residual risk** and its consideration in decision-making on acceptability or tolerability of risk appears also to be a seldom practised task within EIA in most countries. Although the assessment methods applied were often considered technically adequate, too little attention is given to limitations and uncertainties inherent to each method. The effectiveness of risk assessment in terms of integrating its outcome into final decision-making was questioned. Standards or criteria for evaluating the acceptability of risks are largely lacking.

The empirical findings suggest a need for more systematic and deliberate approaches and more methodical coherency of risk assessments in EIA, including strengthening of risk communication and involvement of the public as well as of risk-based decision-making.

3.2.3 Influence of risk assessment in EIA on project modifications

The empirical results indicate that influences of risk assessment in EIA on project modifications exist, but that influences generally vary, depending on hazard categories and Member States. Even when extraordinary hazards are considered in EIA, the influence of hazard assessment on project designs and decision-making on risk avoidance, risk reduction and risk control measures is generally limited. In comparison, the consideration of **risks of accidents** has a higher perceived effectiveness on project design than other hazard categories. These results are basically much in accordance with the findings of Wende (1998) and of more general previous studies, which have repeatedly shown that the effectiveness of EIA is much lower than it could be (e.g., Kobus & Lee, 1993; Lee et al., 1994; Frost, 1994, 1997; Wood & Jones, 1991, 1997; Reeder, 1994; Sadler, 1996).

Generally, **mitigation measures** are a standard feature of EIA in all countries, but not necessarily specific **risk reduction** and **control measures**. It is often unclear if the implementation of risk management measures is a result of the EIA process as such, and if they are based on results of a systematic preliminary risk assessment.

Risk sources are often identified and eliminated through **internal risk assessments** done by developers or as a result of preliminary consultations with authorities prior to EIS submission, which indicates that there is some effectiveness of EIA in terms of anticipatory project planning under the premise of EIA. However, risks that are not recognized because no assessment is applied cannot be mitigated.

Technological risk prevention measures integrated into the project design (e.g., process safety systems) are more often implemented than **precautionary measures** to limit the consequences of a **hazardous incident** occurring (e.g., alarm and emergency plans). Sometimes, mitigation measures in the EIS are aimed mainly at demonstrating that risks have been assessed and designed out.

Due to largely non-existent **post-project monitoring**, **compliance** with prescribed mitigation measures is seldom checked. Stakeholders could identify only a few cases where development consent had been refused because of unacceptable risks, partly because such risks are usually clarified in earlier stages of EIA procedures. However, these examples demonstrate that timely consideration of significant risks can save costs for developers.

In principle, effectiveness of risk assessment in EIA depends on its integration and outcome in decision-making; otherwise, it is a waste of time and money. Thus, if the aim is to increase the importance and weight of risk assessment in EIA, improving the coverage of hazards and risks and including risk sections to EIS is simply not enough. What is required is the proactive integration of the results of risk assessment into decision-making processes, provided that risk is considered significant. Besides, evidence from previous studies exists that project modifications in early stages of the EIA process are generally highly favourable, because changes to designs in later stages may render obsolete impact prediction and mitigation proposals (Cashmore et al., 2004) and increase overall cost and duration of EIA. Awareness-raising could help promote such early integration of risk assessment in project planning.

3.2.4 Barriers towards a better integration of risk assessment into EIA

In general, perceptions of barriers in the different Member States appear to be highly varied, but across all Member States some were mentioned frequently by questionnaire respondents and interviewees. These include in particular the following:

- missing technical guidance on how to apply risk assessment in EIA;
- lack of know-how, expertise, practical experience and training;
- missing legal requirements for consideration of risks in EIA;
- missing definition of the concept of risk in the context of EIA;
- lack of adequate methods;
- application of risk assessments in other project authorisation procedures, and deficits in coordination;
- difficulties in integrating outcomes of risk assessment in decision-making processes, in particular with regard to evaluating acceptability of risk;
- fears about overburdening EIA, increase in duration and cost of procedures;

Among other barriers that were mentioned by respondents from individual countries were:

- difficulties in communicating risk issues and handling them in public participation;
- fear of EIA authorities and EIS review agencies regarding the reactions of the public during public consultation;
- lack of awareness for significance or probabilistic nature of many hazards (such that have not occurred recently);
- lack of communication between risk assessors, EIA practitioners and competent authorities, partly due to unclear institutional arrangements;
- lack of willingness to fund appropriate studies or address risks on the part of project proponents.

The two proposed barriers that were affirmed by the lowest shares of questionnaire respondents were that *'addressing risk issues would make public participation more complicated'*, and that *'risk*

issues are too complicated to be included in EIA'. However, the significance of individual barriers on Member State-level varies, and none of the above mentioned barriers can be regarded as irrelevant, depending on the country-specific context situations. In order to enhance the coverage of extraordinary risks in EIA, at least the most often identified barriers should be tackled in a deliberate and coordinated approach, bearing the importance of country-specific factors in mind.

3.2.5 Need for more coverage or deeper integration of risk assessment in EIA

Positive and negative answers to the question on the need for more coverage and deeper integration of risk assessment in EIA were evenly divided between the countries. No interviewee stated '*less need for risk assessment'*, with one exception: the obligatory use of health risk assessment for all projects in one country was felt to be 'overdoing'. Negative answers were mostly justified with the existence of risk assessment requirements in other procedures.

Others strongly recommended extending application of risk assessment in EIA also to projects that are not subject to such requirements under specific applicable legislation. Many experts stated that **more systematic and comprehensive approaches** were needed, but mainly for **accident-prone technologies** or dependent on locations. Yet, to avoid overburdening EIA and to ensure focus on the significant issues, most experts preferred case-based approaches instead of making **risk assessment mandatory for all projects**. More coverage in EIA was requested for **technological risks** (industrial accidents, all risk technologies) and for specific **health risk agents** (high-frequency radiation, electromagnetic smog, radioactivity from spent fuel), but distinctly less often for ecological risks (ecosystems well-being).

3.2.6 Major social risks: coverage and effectiveness

According to the empirical results, risks of major social and socio-economic impacts (migration, unemployment, impoverishment, etc.) are to a large extent a marginal or even a non-existent issue in European EIA systems. They may sometimes be mentioned formally in the EIS, but mostly only positive socio-economic effects are mentioned to justify the need for a project. Even when **major social risks** are addressed, the perceived effectiveness in terms of project modifications is modest. Nearly two thirds of all respondents of the questionnaire saw no or little influence on EIA outcome. Yet, sometimes social issues may enter the EIA process via public participation. There was much support for the view that the assessment of social impacts should be kept outside EIA.

3.2.7 Coordination with risk assessment under other licensing regimes

Most risk assessments occur under other project licensing regimes parallel to, or separate from, EIA, in particular under project-level authorisation regimes that are subject to the Seveso II and IPPC Directives, or under sectoral regulations for specific project types. However, the EIA Directive has the broadest field of application and essentially covers all project categories likely to have significant effects on the environment.

A variety of ways the licensing procedures under the Seveso II and IPPC Directives are organised in relation to EIA procedures are in operation in Member States, with differences in organisation and timing of procedures, institutional arrangements and working routines. Due to inappropriate timing and organisation of procedures, institutional barriers and a lack of cooperation between involved experts and authorities, coordination between EIA procedures and Seveso II-/IPPC-related procedures is mostly poorly developed and there is little real information exchange. This was recognized and regretted by many experts, although some saw no need to duplicate risk assessment in EIA.

There are often no or insufficient linkages between EIA procedures and risk assessments in other procedures. Even in those few institutional and legal systems where some degree of formal integration of procedures exists, effectiveness of coordination in practice appears to depend to some extent on the cooperation of EIS reviewers. In a few Member States, EIA is a dependent part of other procedures under applicable sectoral legislation; for projects that are simultaneously subject to EIA and certain subject specific regulations that require risk assessment, **both an EIS and a separate risk study are submitted**. However, in practice these are **parallel processes** and risk studies are **seldom fully incorporated into the EIS**, but mostly only referenced or briefly summarized in, or annexed to the EIS. In some Member States, EIA and IPPC/Seveso are completely independent procedures with no linkage whatsoever. In a number of countries, procedures follow a sequential order, with Seveso II and IPPC procedures subsequent to EIA and requiring the EIA permit. There is much evidence that those Member States practicing a consecutive approach have particular difficulties in integrating the results of the different processes: The outcome of risk assessments under later procedures can hardly be integrated into EIA, and safety risks estimated for Seveso II, IPPC or other purposes tend to be not evaluated for their environmental consequences. On the other hand, the design of risk management measures under later procedures lacks appropriate information on the environmental effects of hazardous incidents.

3.2.8 Empirical results and desk research: Context

Analysis confirms that the EIA Directive is inexplicit in its wording about the need and extent to which extraordinary hazards and risks should be considered in EIA. This gives way to ambiguity, causes technical interpretation problems, and appears to be in favour of a large amount of discretion in handling the Directive on the part of Member States, national authorities and EIA stakeholders. Our empirical evidence suggests that such ambiguity and discretion is apparently not in favour of a broad and consistent coverage of risks in EIA across the Member States. Contrary to that, the European Court of Justice has consistently ruled that the Directive should be interpreted as having a wide scope and a very broad purpose (EC, 2003a). EC's guidance on EIA (2001a, 2001b, 2001c) indicates that the Commission has a much wider interpretation in mind than is explicitly stated in the Directive. It would thus appear that the policy design of the Directive is imperfect and produces 'pre-programmed' implementation deficits.

The overall results of the desk research provide strong evidence that there are considerable inconsistencies in the ways the Directive has been implemented and interpreted by Member States in terms of risk. Both national EIA legislation and EIA guidance reflect a variety of approaches to dealing with extraordinary risks in EIA. The risk categories covered fluctuate along a broad spectrum, ranging from risk of accidents as a screening criterion to virtually all risk categories that are of interest within this report. Albeit being in compliance with or sometimes exceeding the EIA Directive, in general rather narrow concepts of risk focusing on accidents predominate; sabotage is only mentioned once in one single country. In none of the reviewed EIA legislations, social and socio-economic impacts are ever mentioned. In general, the wide understanding of the Directive's scope put forward in EC's guidance on EIA appears to have had little impact on Member States. Given the fact that the European EIA legislation is not very clear about its scope in terms of risk, it must not come as a surprise that a number of different risk concepts and varying requirements for consideration of extraordinary risks in EIA are to be found in EIA regulatory frameworks of the Member States. Consequently, inconsistencies in coverage of risks in national EIA practices must not surprise, either.

As national EIA legislation and guidance often make very divergent statements on the issue of risk in EIA, the desk research results are difficult to correlate with the empirical results, because it is impossible to determine if EIA practice is influenced stronger by (the lack of) legal requirements, or by indicative recommendations in guidance, or by neither nor.

Nevertheless, in general it can be said that often risks are covered better in EIA practice as EIA legislation would suggest. The study results also show, however, that the impact of neither legislation nor guidance on EIA practice appears to be strong enough to clearly translate into action on the ground.

3.2.9 Integration of risk assessment into EIA

Both results of the desk study and of the empirical surveys have identified inconsistencies in the risk-relevant regulatory framework and have highlighted the need for better coordination of risk assessment under different procedures. Stronger integration of procedures would clearly favour material coordination, and the point of time at which documentation and information has to be presented is important to use synergies (IMPEL, 1998). To make project-level risk assessment more efficient and to avoid both gaps in coverage of projects and threats of double work, better streamlining of procedures would be needed. Proper timing of certain procedural stages, integration of relevant risk assessment results required under one procedure into the information and documentation submitted under another procedure, ensuring exchange of information and documentation between involved authorities in due time, and making it available to the decision-making process appears to be crucial.

EIA offers an appropriate legal and procedural framework for the integration of risk assessment (Greiving, 2005). In many cases, risk-based considerations may even be required to fulfil the substantive objectives of EIA as an instrument of precautionary and preventive environmental protection. However, up to now risk assessment has not been widely used in European EIA practice. This may partly be due to a predominating view on part of the EIA community that risk assessment is complicated, difficult to understand and communicate, and usually costly. Yet, this is not necessarily the case. Risk assessment consists of highly adaptive and flexible tools that have many benefits to offer to EIA both as supportive and complementary techniques. With regard to integrating risk assessment into EIA, it is important to recognize that there are different levels of sophistication, complexity and, hence, costliness for risk assessment. If applied to particular problems, it may not need to progress as far as a detailed quantitative stage and therefore may not involve large costs (Brookes, 2001). A complete quantitative risk assessment will be performed as a part of the EIA process only when uncertainties are large and important for prudent decision making (ADB, 1997), and when there are arguments that risk is significant, i.e. when potential damage is severe and/or the likelihood of its occurrence is high.

Applying a tiered procedure where the level of effort and sophistication that is put into risk assessment is at each tier determined by the magnitude and significance of the risk studied, the sensitivity of human or environmental receptors, and the quality of available data offers a pragmatic approach to integrate risk assessment into EIA, because it can transform what is perceived to be a sometimes complex and resource-intensive process into a practical aid for decision-making. A purely qualitative risk screening that is conducted at the screening and/or scoping stage of an EIA procedure may in many cases be sufficient. Only if risk screening provides evidence that there are significant risks, it would be required and justified to proceed with a more detailed risk assessment. Depending on the priority of identified risks, it may be decided to apply a more detailed generic risk assessment or even a "full-blown" tailored quantitative risk assessment (Brookes, 2001; EA, 1997; ADB, 1997; DEFRA, 2000). However, taking decisions on whether some kind of more or less extensive risk assessment is justified or not requires giving risk issues at least some consideration in the EIA process.

A broad variety of methods, techniques and tools exist that suit diverse application purposes. However, knowledge on how to apply risk assessment must be made available to the EIA community. At present, in Europe there is still a lack of professional expertise in risk assessment.

On the one hand, specialised risk assessors and risk managers are not easily available in many countries, and on the other hand, both EIA practitioners and competent authorities often lack training and experience in issues of risk assessment, management and communication. This may also cause communication problems between risk assessors and EIA experts. There is clearly a need for both groups to familiarize themselves with each other's field of knowledge.

Moreover, though a wealth of methods for applying risk assessment to environmental issues exists, this knowledge needs adjustment to the specific requirements of EIA. There is a need for developing operational, practicable and cost-efficient "real world" methods to be applied in EIA and to elaborate specific technical guidance. This could be fostered by knowledge transfer from various fields of application that are more experienced and advanced in risk assessment and targeted research aiming at cross-fertilization between EIA and risk assessment.

3.3 Policy Options

3.3.1 Introduction

Based on the findings of the desk research and the analysis of the empirical data concerning risk assessment and EIA, this chapter presents a series of policy options that are designed to enhance the integration of risk assessments in EIA and to increase the consistency of the various approaches across the European Union.

The policy options represent a range of different courses of actions that the European Commission could take to better exploit the full potential of EIA to act as an effective instrument of preventive and precautionary environmental protection by identifying, assessing and managing project-related risks. They aim at tackling the identified weaknesses of the current European EIA practice in terms of covering extraordinary hazards and risks and at overcoming the most important barriers. They also attempt to build on and advance the partly existing strengths.

The policy options presented hereafter are addressed to the European Commission. Yet, ultimately they are targeted at Member States and EIA stakeholders and are intended to influence actual implementation and application of EIA at national and regional levels. Their main functions are to provide decision support to the policy making process at a Community level, to assist informed decision-making on possible future amendments to the European legislation, and to contribute to the improvement of guidance on EIA application, but also to stimulate discussions within the European EIA community.

Building on the IMP3 research results, seven policy options have been developed:

- Policy option 0: Zero option: ‘Do nothing’
- Policy option 1: Guidance ‘light’: Enhancement of existing EC guidance
- Policy option 2: Preparation of a new technical guidance package plus pro-active dissemination activities
- Policy option 3: Set of supporting measures
- Policy option 4: Launching of a risk assessment initiative with a broader perspective
- Policy option 5: Minor amendment to the EIA Directive plus new technical guidance package plus support for implementation
- Policy option 6: Major amendment to the EIA Directive plus new technical guidance package plus support for implementation

Each policy option is to be understood as an entire package of individual measures to be taken. These measures comprise both “soft” and legislative courses of action that are designed to operate mainly along three major axes: guidance, supporting measures, and regulatory or legislative measures. While some options are located on the same axes, they may be situated at different points of those axes regarding intensity and strength of intervention. With the exception of option 0, which excludes all other options, the logical relationship between the policy options should be seen as complementary in allowing combinations with one another. In fact, taking an additive approach and combining several policy options is not only possible, but may offer a variety of advantages and increase their effectiveness. At any rate, any amendments to the EIA directive would require accompanying supportive measures and additional guidance. Thus, some policy options are proposed that incorporate other options, or sub-sets of relevant actions thereof.

The policy options suggest interventions at different stages of the EIA policy process and the EIA policy implementation cycle (Bussman et al., 1997; Windhoff-Heritier, 1987). While some options focus primarily on improvement of implementation and application of the existing EIA regulatory framework, others propose changes to the European EIA policy design.

For each policy option, a SWOT-Analysis has been conducted, which provides indicative lists of strengths and weaknesses, opportunities and threats. While this represents a solid basis for decision-support, it can not substitute a more rigid cost-benefit-risk analysis to be carried out by the Commission.

3.3.2 Policy Option 0: Zero option: 'Do nothing'

The “zero option” represents the “business as usual” scenario. It assumes that no particular actions of any kind are taken by the European Commission, neither on the level of Community legislation nor along the axis of guidance enhancement nor regarding supportive measures, such as awareness-raising, knowledge-sharing, or targeted research.

It is anticipated that the full range of weaknesses and insufficiencies of European EIA practice in terms of risk assessment having been identified by the IMP3 project will continue to persist, including, *inter alia*, the following:

- extraordinary hazards and resulting risks for man and the environment will continue to be addressed inconsistently, with considerable variability in terms of coverage of different risk sources, and with significant differences in consideration of each hazard category both between and within Member Sates;
- methodological and technical approaches to the practical application of risk assessment and risk management in EIA will continue to often lack coherence, deliberateness, systematic coverage, technical soundness and adequacy;
- existing barriers to the enhancement of risk assessment in EIA will not be tackled systematically;
- coordination between EIA procedures and risk assessment under other development consent procedures that are subject to different regulatory and environmental control regimes will continue to be partly ineffective and inefficient, and the full potential of synergies will remain unexploited;
- even when risk assessment is applied in EIA, its effectiveness in terms of influence on decision-making, project designs, project modifications, and appropriate risk management measures to prevent, reduce, control and mitigate risks will remain limited.

The "zero option" would also imply that strengths and promising approaches that partly exist will not be consciously built on and encouraged.

SWOT-Analysis Policy Option 0: Zero option: 'Do nothing'	
Strengths	Weaknesses
▪ No financial cost neither for Commission nor for Member States ▪ No additional effort required ▪ No political negotiations with Member States and economic interest groups required ▪ No change to existing national regulatory frameworks, institutional arrangements and working routines required ▪ Comfortable to most Member States as existing EIA systems can be retained unchanged	▪ The full range of existing weaknesses of current EIA practice in terms of risk assessment continues to persist ▪ No incentives for those MS where good practices partly exist to develop and expand their strengths ▪ No progress, or progress is likely to be slow and incidental ▪ Commission fails to live up to its own principles of environmental policy ▪ Divergent and inconsistent approaches to risk assessment in EIA across Europe are likely to persist ▪ Risks associated to developments continue to be undervalued ▪ Barriers to integration of risk assessment into EIA are not tackled deliberately ▪ Lack of coordination between procedures under different risk-related Directives will persist ▪ Heterogeneous coverage of risks among Member States will continue to cause problems in the case of projects with serious risks with potentially transboundary consequences
Opportunities	Threats
▪ Individual Member States who have progressed beyond legal Community requirements and are more advanced than others can continue their own path of action ▪ All Member States can develop at their own pace ▪ The present situation allows Member States a considerable amount of discretion in interpreting the Directive's requirements regarding risk assessment, which can be used to suit best national needs ▪ New Member States can gain further experience in applying the Directive in its present form	▪ Application of EIA fails to fulfil the substantial purposes of the Directive ▪ Failure to recognize and address serious risks adequately may cost many human lives and cause high financial and environmental costs, including liability claims to project operators ▪ Does not change anything about the insufficient policy design of the Directive ▪ Different levels of environmental protection across the EU ▪ Divergences in the application of EIA in Member States may increase ▪ Differing national requirements for risk assessment in EIA imply incoherent conditions for economic development and may cause biases in economic competition between countries ▪ More advanced countries could cut back their requirements for risk assessment in EIA ▪ The longer present EIA practices persist, the harder it will become to change them ▪ "Double-checked" projects through obligations from other Directives and/or regulations increase costs of procedures for developers and governments ▪ Full potential of EIA to act as an effective instrument for the implementation of the preventive and the precautionary principles in environmental protection is not exploited

Table 8 SWOT-Analysis for Policy Option 0: Zero option: 'Do nothing'

3.3.3 Policy Option 1: Guidance 'light' – Enhancement of existing EC guidance

Policy option 1 focuses on the **review and enhancement of existing EC guidance** on EIA. It encourages an examination of current EC checklists on screening, scoping and EIS reviews as to their completeness, up-to-datedness and adequacy in terms of identifying, describing, assessing, and mitigating project-related hazards and risks.

Compared to the EIA Directive, existing EC guidance on EIA is considerably more explicit in indicating that natural hazards are within the scope of EIA, and that the risk of accidents is not only a screening criterion, but should be examined throughout the EIA procedure (EC, 2001a, 2001b, 2001c). However, the checklists for screening, scoping and EIS review do not cover all aspects identified as important in this report. There is potential to highlight and emphasize the role of considering risks in EIA. Also, linkages to other risk-related Directives could be indicated, including in particular the SEA, IPPC, and Seveso II Directives.

Extended definitions, key references, and links to relevant information sources could be added. While EC guidance is quite inclusive and comprehensive in recommending *what* should be considered in EIA, few indications are given on *how* this should be done. By supplementing the set of checklists with a further volume specifically for EIS preparation, additional practice-related support for EIA practitioners could be provided.

An add-on to existing guidance could include a "toolbox", which would provide an indicative list of well-proved methods for EIA, including methods for risk assessment, and references and links to further information sources.

Policy option 1 suggests the following actions to be taken:

- Review and upgrade of the EIA guidance on screening (EC, 2001a)
- Review and upgrade of the EIA guidance on scoping (EC, 2001b)
- Review and upgrade of the EIA guidance on EIS review (EC, 2001c)
- Review and upgrade of the guidelines on the assessment of indirect and cumulative impacts and impact interactions (EC, 1999a, 1999b, 1999c)

SWOT-Analysis Policy Option 1: Guidance 'light' – Enhancement of existing EC guidance	
Strengths	**Weaknesses**
▪ Marginal financial cost ▪ Little effort is required ▪ Simple in technical terms ▪ Builds on what already exists ▪ Does not require much political negotiations with Member States and economic interest groups ▪ Can be implemented within a short time ▪ Little resistance from Member States and stakeholders is to be expected ▪ Gives the Commission the opportunity to accentuate and strengthen its opinion on the Directive's scope without changing the Directive as such ▪ Guidance should be updated regularly anyway ▪ No change to existing national regulatory frameworks, institutional arrangements and working routines is required ▪ Would favour improvement of EIA practice and harmonization of coverage of risks between countries	▪ Guidance is non-binding and relies completely on good will and voluntary compliance, whose presence must not be taken for granted ▪ Even if Member States use enhanced guidance to upgrade their own national guidance, there is still no need for stakeholders to comply with it ▪ Existing guidance appears to be underused already at present ▪ Little impetus to counteract existing weaknesses of current EIA practice in terms of risk assessment ▪ Does not change anything about the insufficient policy design of the Directive ▪ No or slow progress in the majority of Member States may be anticipated ▪ Low visibility impact ▪ Divergent approaches to risk assessment in EIA across Europe are likely to persist ▪ Barriers to integration of risk assessment into EIA are not tackled in a systematic and deliberate way ▪ Enhancement of existing guidance does not address the lack of coordination between procedures under different risk-related Directives ▪ Heterogeneous coverage of risks among Member States will continue to cause problems in the case of projects with serious risks with potentially transboundary consequences ▪ Lack of visibility on the European political agenda ▪ Leadership role of the Commission is minimal
Opportunities	**Threats**
▪ Member States can use enhanced EC guidance to upgrade their own national guidance ▪ Flexibility in implementation of the Directive would still be preserved ▪ Member States can continue to develop at their own pace and in a way that suits best their national needs ▪ Supports momentum of positive development that exists in some Member States ▪ New Member States are not overburdened with new needs to implement and apply new legal Community requirements	▪ Not enough impetus to overcome the inertia of established institutional systems ▪ Non-compliance with guidance will continue to persist ▪ The existence of updated guidance will be overlooked ▪ The most important barriers to integration of risk assessment into EIA remain untackled ▪ Application of EIA may still fail to fulfil the substantial purposes of the Directive ▪ Lack of coordination between procedures under other risk-related Directives are likely to persist ▪ If upgraded guidance will be followed by only some MS, the different levels of environmental protection across the EU, as well as inequities between citizens in different Member States, might increase ▪ If upgraded guidance will be followed by only some MS, incoherent conditions for economic development and threats of biases in economic competition between countries might increase

Table 9 SWOT-Analysis for Policy Option 1: Guidance 'light' – Enhancement of existing EC guidance

3.3.4 Policy Option 2: Preparation of a new guidance package plus pro-active dissemination strategy

Policy option 2 suggests preparing a comprehensive new technical guidance package on the practical application of risk assessment in EIA. By relying on "soft" knowledge-enhancing measures and by pursuing a non-regulatory path of action, the application of the present EIA Directive would be enhanced without changing European legislation.

Contrary to existing EC guidance, the new guidance would be much more a “how to do”-manual, answering questions as to what, why, when and how to assess risks in EIA. The guidelines could be issued for specific application purposes, focusing amongst others, on natural or technological hazards, and certain high-risk project types. The new technical guidance would respond to some of the barriers to more coverage of risk assessment identified most frequently by stakeholders and to the strong empirical indications identified by the IMP3 project that risk assessment within EIA is often unsystematic, incoherent and incomplete in terms of methodology in the Member States.

Based on a preparatory collaborative process, and supported by systematic dissemination activities, the new guidance package on risk assessment in EIA should provide support and advice on the key issues presented below:

Preparatory activities

- consultations with Member States and relevant stakeholder groups on policy-level.
- establishment of an expert-level working group consisting of representatives of the Commission, Member States, EIA stakeholder groups, EIA experts, and risk assessment experts, to build on existing knowledge and experience.

Guidance package: key issues to be addressed

- clear definitions of the concept of risk and of terminology in the specific context of EIA
- specification of hazard categories and risks that should be considered in EIA, as well as of those outside the scope of EIA
- technical and methodological guidance on how to apply risk assessment approaches as supporting and complementary techniques within EIA
- models, methods and tools of risk assessment specifically suited to EIA applications, including indications of limitations inherent to each method
- technical guidance on integrating risk-based considerations into decision-making and on risk management
- recommendations on procedural integration of risk assessment in the EIA process, including strengthening of scoping to facilitate focussing EIA on significant risk issues
- technical guidance on risk assessment and public participation (incl. risk communication, risk psychology, cognitive barriers, risk perceptions, etc.)
- establishment of an effective post-project monitoring system (EIA follow-up process)
- compilation of good/best practice examples for applying risk assessment in EIA
- indications of typical pitfalls and limitations
- collation of references and links to relevant literature, resources, institutions, websites, etc.

Pro-active dissemination strategy:

The guidance would be disseminated to all relevant EIA stakeholder groups to raise awareness about the existence of new guidance and to encourage its use in everyday EIA practice. “Pro-active” dissemination is to be understood as a strategy that uses all available information channels, rather than relying merely on the official European Union website:

- Distribute new guidance among Member States and all EIA stakeholder groups:
  - via translation into Member States languages
  - via presentation at conferences, technical journals, circulation of newsletters and e-mails in the EIA community, etc.
  - via EIA gateway of DG Environment on the European Union website, posting on websites of relevant national and international organisations
  - via involving stakeholders already in the preparation phase, both awareness and acceptance of new guidance can be increased
- Promoting the actual use and practical application of new guidance
- Encouraging Member States to develop their own technical guidance on risk assessment in EIA that is in accordance with EC guidance and that uses its recommendations as minimum requirements for good practice, but may go further beyond

SWOT-Analysis Policy Option 2:
Preparation of a new guidance package plus pro-active dissemination strategy

Strengths	Weaknesses
▪ No legislative implementation costs for MS ▪ Likely to be cost-efficient in terms of relationship between time, money and personnel involved and the likelihood of improvements ▪ Can be implemented within a medium-term time span ▪ Builds on existing regulatory frameworks and institutional arrangements ▪ Responds directly to the barriers rated most important by stakeholders ▪ Provides strong knowledge support for all Member States and stakeholders ▪ Not much need for political negotiations with Member States and economic interest groups due to non-binding nature of guidance ▪ Political resistance from Member States and stakeholders is expected to be limited ▪ Creates the predisposition for more widespread use of risk assessment in EIA, by making the necessary knowledge available ▪ Systematic, collaborative approach appreciating the role of MS in preparing new guidance ▪ Technical clarification of definitions, of the concept of risk and of the field of application of EIA ▪ New guidance is more likely to be noticed than changes to existing guidance ▪ Desired impact of new guidance is supported by systematic dissemination activities ▪ Puts risk assessment in EIA on the European political agenda with significant visibility	▪ Due to its non-binding nature, effectiveness depends on compliance of Member States ▪ Even if Member States use new guidance to develop their own national guidance, there is still no need for stakeholders to comply with it ▪ Existing guidance appears to be underused already at present ▪ Progress is still likely to be rather slow in a number of Member States ▪ A certain amount of divergence in approaches to risk assessment in EIA across Europe is likely to persist ▪ Does not address all barriers to integration of risk assessment into EIA ▪ Lack of coordination between procedures under different risk-related Directives is not addressed actively ▪ Different interpretations of guidance could again lead to varied applications ▪ In most European countries, there is a lack of specialized risk assessors and risk managers, which may be still required for quantitative assessments and more complex problems ▪ Technical guidance can not compensate for gaps in baseline data on toxic properties of specific substances or their compounds ▪ Decision-makers still need to integrate results of risk assessment into decision-making and to develop an appropriate understanding of risk, because risk assessment provides decision-support, but it cannot substitute decision-making
Opportunities	**Threats**
▪ Member States can use new EC guidance to develop their own guidance on risk assessment ▪ MS can continue to develop at their own pace ▪ Good compliance of Member States with new guidance can considerably improve harmonization of coverage of risks between countries ▪ New MS are not overburdened with new needs to implement and apply new legal requirements ▪ New guidance could reduce conflicts arising from projects that generate risks with potential adverse consequences with transnational impacts ▪ Could be a medium-term step that prepares a future amendment to the Directive	▪ Increased cost for project developers in some cases can not be excluded ▪ Established systems and traditional working routines may prove to be too inert to be changed without new regulations ▪ Non-compliance with guidance could continue to persist, and application of EIA may still fall short of the substantial purposes of the Directive ▪ Lack of coordination between procedures under other risk-related Directives is likely to persist ▪ If new guidance will be followed only by some MS, the different levels of environmental protection and incoherent conditions for economic development across the EU might increase ▪ New guidance as a stand-alone approach may be too passive to cause substantial changes

Table 10 SWOT-Analysis for Policy Option 2: Preparation of a new guidance package plus pro-active dissemination strategy

3.3.5 Policy Option 3: Set of supporting measures

Policy option 3 comprises a comprehensive set of measures building entirely on "soft" strategies to support the integration of risk assessment in EIA practice, to promote its more widespread use and to enhance its technical excellence. The suggested activities focus on awareness-raising activities, knowledge-sharing and information, training and capacity-building, and targeted research.

The package may be applied as an entire bundle of complementary activities in a concerted action. Effectiveness, however, can also be expected if actions are taken individually or are downsized to a reduced selection of measures. It may be particularly conducive to combine policy option 3, or a sub-set of actions thereof, with any other option presented here, thereby increasing effectiveness of options reciprocally. In detail, the measures of policy option 3 for supporting the use of risk assessment in EIA are the following:

Awareness-raising

- Development, funding and implementation of a long-term awareness-raising programme for EIA and risk assessment professionals from the public, private and NGO sectors on the links between project development and environmental risks that:
  - promotes interdisciplinary exchange of knowledge and experiences between EIA and risk assessment
  - encourages inclusion of risk assessors in EIA teams
  - raises awareness on the need for cooperation and coordination across traditional institutional and professional barriers
  - raises awareness among EIA experts about the multiple benefits that integration of risk assessment in EIA has to offer
  - promotes assessment of risks in early stages of project planning and project design;
  - points out to the different risk perceptions and the differing levels of awareness of certain hazards between Member States

Training and education

- Development, funding and implementation of a systematic, widespread and long term training, capacity-building and educational programme for EIA and risk assessment professionals from the public, private and NGO sectors on risk assessment in EIA

Knowledge-sharing and information activities

- Promoting international knowledge exchange on risk assessment in EIA, including with non-European countries (interdisciplinary conferences, stakeholder workshops, expert groups etc.)
- Re-activation of national EIA centres to act as national focal points and links within and between Member States, and financial support to ensure their sustained existence and operation
- Establishing an interactive internet platform, possibly accessible via the EIA gateway of DG Environment, which can serve as a forum for discussion, where questions can be posted and frequently asked questions would be answered by experts of DG Environment

- Establishing and maintaining an electronic database on the website of DG Environment that should feature, amongst others, relevant official documents (legislation, guidance) provided by the Member States and an online collection of case studies and good practice examples, with regular updates of the material
- Establishment of an EIA documentation centre on EU level, and making the information electronically accessible

Research

- Funding of targeted research on EIA and risk assessment, and launching of appropriate research programmes, with a focus on:
  - methodological problems;
  - interdisciplinary knowledge transfer to EIA from other scientific and technical fields, such as health risk assessment, occupational health and safety, engineering sciences, technology impact assessment, etc., that are more experienced and advanced in risk assessment methodologies than EIA;
  - comparative “anatomical” studies of EIA procedures in European and non-European countries in order to improve procedural integration of risk assessment in EIA and to enhance coordination with procedures under other risk-related regulatory regimes;
  - risk communication, with a view to public participation;
  - pilot projects, in order to do practical testing of approaches to risk assessment in EIA and to provide future demonstration examples.

SWOT-Analysis Policy Option 3: Set of supporting measures	
Strengths	**Weaknesses**
▪ Likely to be cost-efficient in terms of relationship between time, money and personnel involved and expected benefits ▪ Builds on existing regulatory frameworks and institutional arrangements ▪ Tackles many of the identified weaknesses of current practice, and the most important barriers towards integration of risk assessment in EIA ▪ No need for political negotiations with Member States and economic interest groups ▪ Likely high level of acceptance on part of MS ▪ Creates a knowledge base for EIA improvements ▪ Creates a sound information base for decision-making on possible future amendments to the Directive ▪ Strengthens cooperation between Commission, Member States and stakeholders ▪ Stakeholders and Member States are given the opportunity to participate actively, which is in favour of new governance and bottom-up approaches ▪ Puts risk assessment in EIA visibly on the European political and research agenda ▪ Meets requirements of the European Convention in terms of improving the system of information exchange between MS and the EU, supporting training schemes and providing for administrative cooperation ▪ Commission takes a visible leadership role	▪ Requires concerted, long-term efforts ▪ Requires sustained input of resources in terms of money, personnel and time ▪ Will be a long-term process until results become available for application in EIA practice, and hence any progress will be slow ▪ Until then, all weaknesses of current EIA practice will continue to persist ▪ Success depends on active interest and willingness of Member States and stakeholders to participate actively in the process ▪ Lack of coordination between procedures under different risk-related Directives is not addressed ▪ Does not change anything about the EIA policy design
Opportunities	**Threats**
▪ Can improve awareness and understanding of risks and risk assessment in the EIA process ▪ Could have a high impact on thinking and behaviour of EIA stakeholders, and enhance early integration of risk considerations in project planning and design ▪ Sharing knowledge and experience can contribute to harmonizing approaches across Europe without regulatory interventions ▪ Flexibility and discretion in application of EIA would remain untouched, and MS can continue to develop at their own pace ▪ Tackles systematically the lack of professionals for risk assessment in EIA ▪ Outcome of research and knowledge-sharing can serve as input to preparation of new technical guidance on risk assessment in EIA ▪ Could be an intermediate step in preparation of a future amendment to the Directive, or assist good implementation of such an amendment	▪ No guarantee that results of the process will ever be applied and become effective in EIA practice ▪ Member States who are satisfied with state-of-the-art will have little motivation to do research and to participate in knowledge-sharing, and might be resistant against awareness-raising efforts ▪ Established systems and traditional working routines may prove to be too inert to be changed without new regulations ▪ Supportive efforts as a stand-alone approach may be not sufficient to overcome identified weaknesses, barriers, and discrepancies between countries

Table 11 SWOT-Analysis for Policy Option 3: Set of supporting measures

3.3.6 Policy Option 4: Launching a risk assessment initiative with a broader perspective

This policy option implies a strategic initiative for risk assessment in the context of a number of European Directives that play a major role in regulating the assessment and management of environmental risks associated with development proposals.

The **overall purpose is to identify and develop a coordinated, integrated, and more** efficient and effective approach **to assessment and management of project-related risks under the different development consent procedures**. Enacting a future Directive on hazard mapping would be an important complementary regulatory measure. Policy option 4 consists of the following **courses of action:**

- Establishing a consultation process with Member States about risk-relevant Community legislation (IPPC, Seveso II, SEA) to discuss and clarify their interrelationships, linkages, overlaps and discrepancies in terms of risk assessment, considering in particular:
  - fields of application of each Directive;
  - different national models of legal implementation;
  - different national approaches to coordination of procedures.
- Entering into a dialogue with relevant EIA stakeholder groups (members of national authorities, EIA practitioners, scientific community) to facilitate knowledge- and experience-sharing regarding development consent procedures under the abovementioned Directives (via workshops, seminars, reports, electronic discussion platforms, etc.)
- Making use of the IMPEL network and building on its previous work.
- Clarifying the role of SEA in project-related risk assessment, considering:
  - the potential of SEA to relieve EIA from burdens regarding risk assessment;
  - the potential of SEA to strengthen coverage of 'social risks',
  - the opportunity to integrate social impact assessment into SEA.
- Comparative review of the different national approaches to organizing and coordinating risk assessment within development consent procedures under the abovementioned Directives, including legal systems, institutional arrangements, administrative practices and established working routines, with a view to identifying strengths and weaknesses ('comparative anatomy' of procedures).
- Based on the outcome of the collaborative process outlined above: development and promotion of a more integrated and coordinated approach to project-related risk assessment and risk management under the EIA, Seveso II, IPPC, and SEA regimes that aims at:
  - establishing efficient links between different procedures;
  - optimising the timing of crucial stages of the procedures that offer suitable interfaces;
  - ensuring exchange of information and documentation between different authorities;
  - avoiding duplication of work;
  - using synergies to the extent possible;
  - ensuring that significant environmental risks are not exempt from assessment.
- Reviewing the formal linkages in Community legislation, and considering possible future amendments to the EIA Directive as well as other risk-related Directives.
- Promotion of better horizontal and vertical coordination between development consent procedures and risk assessment/risk management activities of sectoral policies, legislations, instruments and authorities (e.g., in the fields of land use planning, waste management, water management, etc.),

- Pushing forward the envisaged new Community Directive on hazard mapping, or – alternatively – encouraging national governments to undertake hazard and risk mapping on a voluntary basis and to use harmonised methodologies, preferably by applying a multi-hazard and multiple-risk approach, in order to provide baseline information on existent risks and facilitate hazard identification.

SWOT-Analysis Policy Option 4:
Launching a risk assessment initiative with a broader perspective

Strengths	Weaknesses
▪ Likely to be cost-efficient in terms of relationship between time, money and personnel involved and expected benefits ▪ Enhances knowledge and understanding on interplay of several risk-related Directives ▪ Raises awareness on need for better coordination of procedures under different Directives ▪ Promotes integrated approaches to risk assessment and to project licensing ▪ No urgent need for political negotiations with MS and economic interest groups on forthcoming amendments within a medium-term period of time ▪ Creates a knowledge base for future improvements of project licensing regimes ▪ Shifts need for action from Commission to MS ▪ Creates a sound information base for decision-making on possible institutional and procedural re-arrangements on national level ▪ Strengthens cooperation between Commission, Member States and stakeholders ▪ Stakeholders and MS are given the opportunity to participate actively, which is in favour of new governance and bottom-up approaches ▪ Can be expected to create added values for several licensing regimes beyond the issue of risk assessment	▪ Requires concerted, medium- to long-term efforts ▪ Until then, all weaknesses of current EIA practice will continue to persist ▪ Questions existing regulatory frameworks and institutional arrangements, which may cause acceptance problems on part of some MS ▪ Does not tackle other weaknesses and barriers apart from coordination problems ▪ Success depends to some part on active interest and willingness of Member States and stakeholders to collaborate actively in the process ▪ The considerable differences between national legal systems, institutional arrangements and procedural practices aggravate a concerted approach on European level
Opportunities	**Threats**
▪ Could result in streamlining of national licensing procedures and better exploitation of synergies ▪ Can contribute to more informed decision-making on development proposals ▪ Has the potential to save resources (costs, manpower) and tighten duration of procedures ▪ Shifting risk assessment work to SEA would take some burden from EIA ▪ Member States can streamline their procedures according to their own specific needs ▪ Potential to contribute to more harmonized procedural approaches across Europe without regulatory interventions ▪ Provides the chance that all relevant projects will be subject to adequate risk assessment, regardless of the Directive that applies in certain cases	▪ No guarantee that results of the process will ever be applied and become effective in EIA practice ▪ Member States who are satisfied with state-of-the-art will have little motivation to collaborate in the initiative, and might be resistant against awareness-raising efforts ▪ Established systems and traditional working routines may prove to be too inert to be changed without new regulations on Community level ▪ Risk assessment initiative as a stand-alone approach may be not sufficient to overcome identified weaknesses, barriers, and discrepancies between countries

Table 12 SWOT-Analysis for Policy Option 4: Launching a risk assessment initiative with a broader perspective

3.3.7 Policy Option 5: Moderate amendment to EIA directive plus new technical guidance package plus support for implementation

Policy option 5 proposes amendments to the EIA Directive in order to accomplish a broader, more comprehensive and more systematic coverage of extraordinary hazards and risks in the application of the Directive by making it more explicit and unambiguous in this respect. . This would mainly be achieved by specifying existing wordings and by supplementing present provisions. To that end, clear definitions of the terms 'hazard' and 'risk' in the specific context of EIA would be provided. The changes would clarify existing interpretation problems concerning the scope of the Directive, straighten out misunderstandings and prevent future cases of misapplication. The underlying purpose of the suggested amendments is to narrow the discretion and scope of interpretation that the application of the directive leaves to Member States, and to both sharpen and extend the concept of risk in a more explicit way. This is supported by past rulings of the European Court of Justice, who has consistently ruled that the Directive should be interpreted as having a wide scope and very broad purpose (EC, 2003a).

An explanation would be added that external impacts of the environment and of accidents in other installations on the project are potentially significant if they could cause the project to cause in turn adverse consequences on man and the environment (cf. CEAA, 1992). Since risk is ever present and a situation of zero risk does not exist, the wording of the Directive would make clear that what needs to be considered in EIA is, therefore, not the mere presence of risk, but whether there is a significant risk of and whether the consequences of a risk event happening would be likely to cause significant environmental effects (EC, 2003a).

Policy option 5 would include the new technical guidance package presented in policy option 2. In addition, the EC is assumed to pursue a pro-active communication strategy and to take further supportive measures, in particular training and capacity-building, which would comply with the Commission's commitment to assisting the implementation of EC environmental legislation (EC, 2004; EC, 2002). For that purpose, combining policy option 5 – presented here -with policy option 3 and 4 would be particularly effective.

Based on these considerations, **policy option 5 incorporates**:

- the new technical guidance package described in policy option 2, plus
- appropriate measures of policy options 3 and 4.

In particular, policy option 5 proposes the following **actions** to be taken:

Preparatory activities

- Launching a bilateral consultation process with Member States to facilitate an informed legislation-building process.
- Allowing relevant EIA stakeholder groups to express their views and contribute practical experiences.
- Reviewing related Community legislation and exploring mutual linkages to allow for a maximum exploitation of potential synergies.

Moderate amendments to EIA Directive

- Adoption of clear and unambiguous definitions of key terms in the specific context of EIA, in particular of the terms "hazard" and "risk"
- Widening the explicit concept of risk beyond "risk of accidents" by specifying hazard categories that shall be considered in EIA, if they are relevant and significant, by adding the following potential risk sources to the main part of the Directive and to Annex III:
  - natural hazards (natural disasters);
  - internal accidents (accidents in the submitted project caused by technological failure, human failure, or man-technology interactions);
  - external accidents (man-made disasters in other existing installations in the project environment that could affect a submitted project; 'cumulative risk');
  - sabotage (interferences by unauthorised persons, vandalism, terrorism);
  - impacts of the proposed project on the hazard potential pre-existent at the site.
- **Defining** that hazards related to a project, including impacts of external hazards (impacts of the environment and of accidents in other installations) on the project, are significant if they may cause adverse consequences on man and the environment. Stating clearly that both likely significant effects caused by the normal/standard operation of a project and significant risks due to extraordinary conditions are within the scope of the Directive.
- **Specifying** the expression "*environmental sensitivity of geographical areas likely to be affected by projects*" in Annex III.2 by adding the following criteria:
  - hazard potential pre-existent in the project environment, in particular the susceptibility of the location to occurrence of natural hazards;
  - vulnerability of the project environment (damage potential present at the site).
- Adoption of a more explicit and wider **reference** to the assessment of significant extraordinary risks in the main part of the directive.
- **Support** for **implementation** by:
  - enhancing effective transposition and national implementation of amendments by pursuing a pro-active communication strategy towards Member States, which may involve, e.g., bilateral contacts, seminars and meetings between the Commission and the Member States.
  - Providing new guidance for good application of the amended Directive (guidelines, textbooks, good practice examples) to domestic authorities and EIA practitioners (according to policy option 2).
  - Providing training opportunities and funding capacity-building activities for authorities and EIA practitioners (according to policy option 3).
  - Monitoring of the legislative implementation process, checking if application of EIA on the ground complies with the added focus of the Directive, and evaluation of effectiveness and efficiency by requiring regular reporting.

SWOT-Analysis Policy Option 5: Moderate amendment to EIA directive + new technical guidance package + support for implementation

Strengths	Weaknesses
▪ MS are obliged to take action, but radical changes of national EIA acts will not be required ▪ Makes explicit what was already implicit in the Directive, and legalizes what appears to have already been the Commission's opinion on the scope of the Directive ▪ Corrects the imperfect EIA policy design in terms of risks on Community level ▪ Creates a legal basis for risk assessment in EIA ▪ Effectiveness of regulatory action on achieving change is expected to be higher than that of "soft" strategies ▪ Eliminates legal uncertainty and differing interpretations of the Directive's wording ▪ Would be likely to improve incorporation of risk assessment in EIA and to promote its more widespread use ▪ Could be a significant step forward towards reducing divergent practices between Member States ▪ Responds directly to views of many stakeholders who stated that "a lack of legal requirements" is a main barrier to more coverage of risk assessment in EIA ▪ Combination of amendment with technical guidance and supportive measures facilitates implementation ▪ Puts risk assessment on the forefront of European EIA policy and practice agendas ▪ Demonstration of the Commission's commitment to objectives of environmental protection	▪ More efforts and resources required for the Commission than if guidance enhancement or supportive measures would be applied as stand-alone approaches ▪ Causes legislative implementation costs for MS ▪ Amending the Directive is a long-term approach that will require considerable time for preparation ▪ More time will pass until amendments become fully effective in practice, because time lags will inevitably occur at all stages of the implementation cycle (transposition, integration into sub-legal implementing regulations, practical application, full assimilation into working routines and minds) ▪ Difficult political negotiations with MS and economic interest groups can be expected, and reconciliation of interests may be hard to accomplish ▪ Some potential for conflicting interpretations on the amended Directive's actual implications and concrete requirements for EIA practice may remain ▪ Lack of professional risk assessors and risk managers, which may still be required for quantitative assessments will persist ▪ Decision-makers still need to integrate results of risk assessment into decision-making and to develop an appropriate understanding of risk, because risk assessment provides decision-support, but it cannot substitute decision-making
Opportunities	**Threats**
▪ Deeper and more sustained progress in terms of anchoring risk assessment in EIA than guidance or supportive measures alone ▪ Involvement of Member States and stakeholder representatives in the preparation process is likely to increase acceptance ▪ Would strengthen the position of EIA against other environmental control regimes, and EIA could become the controlling force of environmental risk assessment on project level ▪ Leaves some flexibility and discretion in implementation and application to Member States ▪ Harmonization of coverage of risks between countries decreases conflict potential due to risks with transboundary dimension ▪ Could go a significant way towards realizing the potential of EIA to identify, assess and reduce significant risks adequately	▪ Implementation deficits may still occur at all stages of the implementation cycle: conformity problems at transposition stage, interpretation deficits on level of national sub-legal regulations, incidents of bad application, full integration into working routines and awareness of EIA professionals ▪ More burden will be put on EIA, and EISs may tend to become more lengthy ▪ Increased cost for project developers, in particular in cases of serious risk that may require full quantitative risk assessment ▪ Decision-makers might get confronted with difficult decisions on acceptability of risk ▪ Established systems and traditional working routines may still prove to be inert and resistant against progress ▪ Lack of coordination between procedures under other risk-related Directives might still persist

Table 13 SWOT-Analysis for Policy Option 5: Moderate amendment to EIA directive + new technical guidance package + support for implementation

3.3.8 Policy Option 6: Major amendment to EIA directive plus new technical guidance package plus support for implementation

Policy option 6 is based on similar rationales to those of policy option 5, but it goes considerably beyond in terms of **substantial changes to the EIA Directive**, resulting national transposition needs and anticipated effectiveness regarding integration of risk assessment into EIA procedures. While the moderate amendments to the Directive outlined in policy option 5 are focused on more explicit verbalisations of a wider risk assessment concept, this policy option would represent a much **stronger regulatory approach**.

This policy option directly responds to empirical findings of the IMP3 project, which strongly indicate that

- lacking legal requirements to apply risk assessment in EIA is a main barrier to better coverage of risks,
- compliance with guidance and indicative provisions is limited,
- project developers are often reluctant to employ risk assessment without legal obligations,
- competent authorities too often do not request it,
- there often is a wide-spread lack of effective coordination between EIA procedures and risk assessments under other relevant regulatory regimes.

The suggested amendments would substantially broaden the scope of EIA in a statutory way, while at the same time limiting the discretion of Member States and implementing national authorities in terms of risk assessment to a considerably greater extent than would policy option 5. Furthermore, amendments would imply explicit obligations to consider extraordinary hazards and risks in EIA, and to identify, describe and assess them in the information provided by the project developer (EIS), whenever risks are relevant to a submitted project and their extent is significant.

Such requirements, however, should not exclude the possible use of justified “no impact” statements in cases where the results of hazard identification and risk screening provide evidence that risks are not significant. Thereby, **the threat of overburdening the EIA process with additional tasks and of overloading Environmental Impact Statements with additional information shall be avoided.**

The major amendment to the Directive would have to be accompanied by the **preparation of new guidance, training, and knowledge-sharing**. For that purpose, policy option 6 **may be combined with all other policy options** mentioned before (except the “zero option”), or appropriate sub-sets of these options.

Policy option 6 incorporates:

- the moderate amendments to the EIA Directive described in policy option 5, plus
- the new technical guidance package described in policy option 2, plus
- appropriate measures of policy options 3 and 4, plus
- preparatory activities and specific support measures for implementation similar to policy option 5.

Policy option 6 comprises the following **particular actions** to be taken:

Preparatory activities

- Similar to policy options 4 and 5, but perhaps more intense and deliberate.

Major amendments to the Directive

- Inclusion of an **explicit requirement** to consider relevant extraordinary hazards and significant risks to man and the environment in EIA, complementary to the likely significant effects of a project.
- Adoption of an **explicit obligation** to identify, describe and assess relevant extraordinary hazards and risks to man and the environment in the information provided by the developer (EIS), provided hazards are relevant to a submitted project and the extent of risk is significant.
- Inclusion of an **explicit reference** to consider appropriate risk management and response measures for the prevention, reduction and control of significant risks, including measures to limit and contain adverse consequences of hazardous incidents occurring, as part of the mitigation measures.
- Introducing to the Directive an **explicit reference** encouraging that the documentation required by other risk assessment procedures under other relevant Directives (in particular, the Seveso II, IPPC, and SEA Directives) may be incorporated into, built on and supplemented by the environmental information required by the EIA procedure.
- Reviewing the **project lists** in Annexes I and II of the EIA Directive as to completeness and up-to-datedness with regard to new technologies and project categories with environmental and/or human health risks, and amending project lists, if required.

Support for implementation

- similar to policy option 5

SWOT-Analysis Policy Option 6: Major amendment to EIA directive + new technical guidance package + support for implementation

Strengths	Weaknesses
▪ MS are obliged to take legislative action and to adjust their national EIA acts ▪ Makes explicit in the strongest way what has already been implicit in the Directive, and fully legalizes what appears to have already been the Commission's opinion ▪ Highest effectiveness of all options expected ▪ Eliminates legal uncertainty and differing interpretations of the Directive's wording ▪ Defines clearly the requirements for practical EIA application ▪ Leaves some flexibility in practical application, because it does not prescribe to MS how provisions should exactly be put into practice ▪ Provides most likely for harmonization of approaches between Member States ▪ Responds directly to views of many stakeholders who stated that "a lack of legal requirements" is a main barrier to more coverage of risk assessment in EIA ▪ Combination of amendment with technical guidance and supportive measures provides maximum support of the Commission for implementation ▪ Puts risk assessment on the forefront of European EIA policy and practice agendas ▪ Commission takes a strong leadership role	▪ Considerable financial costs, high efforts and resources needed on part of Commission and Member States ▪ Amending the Directive is a long-term approach that will require considerable time for preparation ▪ More time will pass until amendments become fully effective in practice, because time lags will inevitably occur at all stages of the implementation cycle (transposition, integration into sub-legal implementing regulations, practical application, full assimilation into working routines and minds of professionals) ▪ Difficult political negotiations with MS and economic interest groups must be expected, and reconciliation of interests may be hard to accomplish ▪ Considerable political resistance from MS and (some) stakeholder groups must be expected, acceptance of amendment may eventually be low ▪ Lack of professional risk assessors and risk managers, which may be still required for quantitative assessments will persist ▪ Decision-makers still need to integrate results of risk assessment into decision-making and to develop an appropriate understanding of risk, because risk assessment provides decision-support, but it cannot substitute decision-making ▪ Leaves little discretion in interpretation to MS
Opportunities	**Threats**
▪ Deeper and more sustained progress in terms of anchoring risk assessment in EIA, compared to all other options ▪ Involvement of MS and stakeholder representatives in preparation process is likely to increase acceptance ▪ Would strengthen the position of EIA against other environmental control regimes ▪ Harmonization of coverage of risks between countries decreases conflict potential due to risks with transboundary dimension ▪ Would ensure for the largest possible number of project types that environmental consequences of hazardous incidents are dealt with (projects subject only to EIA, projects subject to the EIA and to the Seveso II or IPPC Directive) ▪ If environmental consequences of risks have to be considered for all project types subject to EIA (whose project lists are more comprehensive than the ones of the Seveso II and IPPC Directives), this would probably cause MS to streamline and consolidate different licensing procedures out of self-interest to avoid duplication and overlaps, and to save time and effort for double/multiple risk assessments	▪ Implementation deficits may still occur at all stages of the implementation cycle: conformity problems at transposition stage, interpretation and concretion deficits on level of national sub-legal regulations, incidents of bad application, full integration into working routines and awareness of EIA professionals ▪ Potential threat of overburdening EIA with additional requirements, EISs may tend to become more voluminous and more unreadable ▪ Increased cost for project developers, in particular in cases of serious risk that may require full quantitative risk assessment ▪ Decision-makers might get confronted with difficult decisions on acceptability of risk ▪ Established systems and traditional working routines may still prove to be inert and resistant against progress ▪ Cases of infringement and incidents of bad application might increase, causing lawsuits and conflict between Commission and Member States

Table 14 SWOT-Analysis for Policy Option 6: Major amendment to EIA directive + new technical guidance package + support for implementation

4 PROJECTS SUBJECT TO EIA

4.1 Theoretical and legal background

4.1.1 General Concepts

Screening is one of the earliest steps in every EIA process. It corresponds to the determination of whether or not a certain project must be subject to an EIA prior to or as a requirement of its licensing procedure.

According to Canter (1996) and Canter & Canty (1993) there are basically two approaches to screening worldwide: those based on policy delineations – a set of screening rules and criteria to be applied by a given community or group of countries – and the preparation of preliminary studies as a means of determining impact significance. In the case of the European Union, whose screening practices belong to the first type of screening approach given the set of rules defined by Directive 97/11/EU, preliminary environmental assessment studies are also used albeit in the context of case-by-case examinations.

Indeed, within the European Union, there are mainly two kinds of screening tools used by MSs:

a. lists of projects with specified threshold values and criteria; and

b. case-by-case examinations.

Lists of projects are straightforward screening tools. According to the type of project or certain project features, such as its dimensions or output data, projects are classified as to the need for an environmental impact assessment. Some projects are subject to EIA in all cases, independently of their dimensions, while other types of projects are subject to an EIA only above certain threshold values or when located in more ecologically sensitive areas. Threshold values are mostly technical, although in France, for instance, also financial thresholds apply.

Lists defining those project categories that must be subject to EIA (in all cases or above certain threshold values) are inclusive (or positive) lists, as opposed to exclusive (or negative) lists, which identify project types below given threshold values exempting a development project from EIA.

In case-by-case examinations, a project is subject to an EIA if certain criteria are met. In some cases, the environmental effects of a project are forecast and evaluated according to a set of predefined criteria, while in some other countries (e.g. Cyprus, Czech Republic, Greece and Hungary) case-by-case examinations take the form of preliminary or simplified EIA procedures whose results determine whether the project must be subject to a full EIA or not.

These two screening methods may also be used in combination, as in the cases where projects must be subject to mandatory EIA above specified threshold values and assessed on a case-by-case basis (when below inclusive threshold values or between inclusive and exclusive threshold values).

Case-by-case examination is a more discretionary screening method, once the evaluation of the expected environmental effects of a project strongly depends on the relative weight given to each criterion. When compared to the use of positive lists, it enables a better consideration of particular features, such as local ecological or socio-economic conditions which may be determinant for the impact assessment of the project. However, it is a more time demanding and administrative resources consuming method that should thus be used only when environmental impacts may be determined to a large extent by local characteristics or in the cases of new or less common project types.

4.1.2 Screening Approaches in the European Context

Table 15 classifies MSs according to the screening method and number of existing EIA procedures.

Classification of MSs according to the main screening method applied and number of existing EIA procedures

SCREENING METHOD		LISTS		LISTS + CBC ANALYSIS	
		1 list	≥ 2 lists	List(s) + Listed CBC	List(s) + Not Listed CBC
EIA PROCEDURE	1 Type of EIA Procedure	Belgium (Walloon)	Slovenia	Belgium (Flanders) Denmark Estonia Ireland Lithuania UK	Sweden Finland
	> 1 Type of EIA Procedures		France Malta Portugal	Austria Belgium (Brussels) Cyprus Czech Republic Germany Greece Hungary Italy Latvia Netherlands Poland Slovakia Spain	

Table 15 Classification of MSs according to the main screening method applied and number of existing EIA procedures

As for the screening method, a major distinction is made between those MSs applying case-by-case examinations on a regular basis and those where screening is made mainly through the use of (one or more) lists of project types with thresholds. In the former case, MSs are also classified

according to whether case-by-case assessments are applied to project types previously defined in positive lists, similar to Annex II of the EIA Directive or to particular cases (not listed CBC).

Additionally, MSs are classified as to the number of screening approaches applied, according to the relevance of expected impacts in the sense that different EIA procedures should correspond to different demanding levels of environmental protection.

As shown in Table 16, most EU countries apply case-by-case examinations as a screening tool. However, only Finland and Sweden apply case-by-case analysis to particular project types (not listed). In the former case, EIA may be integrated in land-use planning procedures, but always as an independent procedure. Projects not listed in the mandatory list are subject to EIA following a decision by the Minister of the Environment, if expected to have significant environmental effects on the basis of a case-by-case assessment. In the case of Sweden, there is a mandatory list describing all the project types subject to EIA in all cases. There is also the possibility for other projects, not included in the mandatory list, to be subject to an environmental impact assessment procedure by decision of the competent authority (County Administrative Boards), on the basis of a case-by-case analysis focusing on the technical characteristics of the project and the site's ecological sensitiveness.

The great majority of countries (see Table 16) apply case-by-case assessments for listed project types, according to one of three possible cases: case-by-case analysis is either applied (1) to projects falling below mandatory thresholds, (2) in-between inclusion and exclusion thresholds/ criteria or (3) to projects included in descriptive lists.

In most MSs (e.g. Denmark, Czech Republic, Estonia, Ireland, Italy, Netherlands, Slovak Republic and the UK), EIA is applied within land-use planning procedures, at national or local level. In Belgium, Denmark, Netherlands, Italy and Spain EIA regulations are enacted and applied at a regional level.

In most countries with *listed case-by-case* screening procedures (e.g. Germany or Latvia), there is always the possibility for case-by-case assessments for non-listed project types likely to give rise to significant environmental effects.

In Malta and Portugal, there is also the possibility for case-by-case assessments, although this is not usually applied as a screening method. In the case of France it is not even considered in the EIA regulations; almost all projects are *a priori* subjected to EIA. These three countries apply EIA at national level.

Within WP4 research activities also focused on the type of EIA authority or the legal context of EIA regulations, in order to better understand how much the EIA systems differ among MSs, as well as to evaluate the main deterrents for changes towards further harmonization of screening procedures. Main findings of the desk research on the 25 Member States' EIA procedures and screening methods are summarized in Table 4 of the WP4 Report.

Regarding the EIA authority, national, regional and sectoral types of EIA authorities were found. In some of the cases, more than one competent authority was found, according to the type of project or licensing procedure.

As for the administrative context of EIA, the great majority of countries have their EIA regulations applied within land-use planning procedures, although EIA regulations may also be enacted under Nature Conservation Laws, as is the case of most Central and Eastern European Countries, such as the Czech Republic, Slovakia or Hungary. In the case of Italy EIA regulations have been enacted at a national level, under Nature Conservation Laws, but are applied by the regions under land-use planning procedures. However, the general rule in most of the cases where EIA is applied within land-use planning procedures, is to have EIA regulations enacted under planning legislation.

4.2 Empirical evidence and key findings

4.2.1 General Findings

Divergent screening methods and, most important, different legal and administrative EIA frameworks, necessarily lead to a heterogeneous day-to-day EIA practice throughout the European Union. This varied application of the EIA Directive results in different project types being subject to EIA, either due to their non transposition to the national EIA regulations or to different inclusive criteria or adopted thresholds. Furthermore, the set of criteria considered in case-by-case assessments chiefly depends on regional specificities and, to a greater or lesser extent, to the discretionary judgement of the competent authorities.

It should thus come to no surprise that the (further) harmonization of screening procedures is seen as a positive measure by most stakeholders, even though the majority of responses account for a general satisfaction regarding the present annexes system of the EIA Directive, regarding both screening methods and the list of projects and criteria/thresholds applied according to national EIA regulations.

Most of the interviewees do not support the proposed changes to the EIA Directive's Annexes system. The present system is regarded as well working, because it combines the use of mandatory lists with thresholds for those major projects likely to have a significant environmental impact with the possibility for MS applying the most adequate screening tools for other types of projects that can be more or less environmentally harmful given ecological, technical or social local specificities.

It is also said that the great diversity of screening procedures practiced among MSs are the result of different contextual factors – administrative (political), social and historical – and thus is not necessarily a problem in itself.

The need for clarification regarding the definition of screening criteria and project types as well as the inclusion of new project types for which present state-of-the-art already enables the setting of *consensual* inclusive threshold values/criteria are the main arguments supporting the deeper

harmonization of the annexes system of the EIA Directive's. In the former case, better guidance on screening criteria as well as clearer project types definitions for some more troublesome cases could lead to less discretionary judgement by EIA authorities on the screening decision and thus, to a less discrepant application of the EIA Directive. The definition of sensitive areas and the problem of cumulative impacts are also referred to as needing further clarification by the EIA Directive.

While acknowledging the need for further harmonization of EIA practice among MSs, for most respondents the present annexes system works well. Annex I lists those projects likely to cause serious environmental effects and are therefore subject to EIA on a mandatory basis in all MS. Transposing annex II project types allows the flexibility to either define mandatory threshold values or set screening criteria for the assessment of the environmental impact on a case-by-case basis. In the latter case, local ecological or social specificities may also be taken into due consideration, which otherwise could hardly be accounted for.

Regarding the three options presented as to the way the present Annexes system could be changed, responses were not unanimous. The suppression of the threshold-approach was highly disregarded by some of the interviewees, as being too high a risk of evasion from the EIA procedure and because it would imply drastic modifications to the present screening procedures set by the EIA Directive and gradually implemented by the MSs.

The proposal of merging the two annexes of the EIA Directive into a single list with thresholds is seen as hardly possible, given the different legal and administrative frameworks of EIA and licensing procedures among MSs, in spite of the simplification of screening procedures and uniform higher levels of environmental protection it might (theoretically) lead to.

Likewise, for the case of the third option – duplicating the project categories in both Annexes – there were both pro and against arguments, the former pertaining mainly to the higher flexibility of the system and the latter referring to it as a "*useless repetition of activities*".

However, some suggestions were made towards the deeper harmonization of the screening procedures while maintaining enough flexibility to account for regional specificities. Essential changes to the screening procedure were considered in accordance to the interviewees' opinions about the advantages and disadvantages of more flexibility versus deeper uniformity, changes to the certain EIA procedural steps, such as a mandatory scoping phase or the deeper integration of EIA into other control regimes. There were also several suggestions referring to EIA good practice as awareness-rising measures or more general and sectoral EIA guidance.

Regarding national/regional lists of projects subjected to EIA, problems lie mostly in the setting of adequate thresholds and not so much in the selection of categories of projects, which should come to no surprise given the fact that all MS already introduced additional project types to their national EIA regulations relative to those listed in the annexes to the EIA Directive.

There were, however, some negative responses concerning national or regional lists of projects, albeit complaints about *too many projects* and *still missing projects* were in similar proportions (around 20% of respondents unsatisfied with the lists of projects in each case). The former referred

mainly to the needless assessment of some minor project types, whereas the latter related mostly to gaps in regional regulations that, according to this group of respondents, did not account for local specificities or impact accumulation.

Table 16 presents the project types mostly referred to for inclusion in both annexes I and II to the EIA Directive. Some of these have already been added by some MSs to their national lists of projects, as e.g. golf courses (Czech Republic, Portugal) or masts for mobile phones and radio or telecommunication stations (Poland, Slovakia).

Regarding the threshold values and criteria supporting the screening decision, some stakeholders drew the attention to the need for a more widespread use of inclusive thresholds in order to avoid needless (case-by-case) screening proceedings. Furthermore, case-by-case assessments may be used as a means to circumvent EIA, as referred to by two German and one Slovak stakeholders, especially in the absence of more limiting screening criteria.

Project types proposed for inclusion in both annexes to the EIA Directive
≥ 50 respondents required clearly mandatory assessment for the following project types:
installations working with Genetically Modified Organisms (GMOs) or pathogenic micro-organism such as laboratories, test facilities, trial areas
military practice grounds
Over 40 stakeholders indicated a requirement for mandatory assessment for:
redevelopment of contaminated land
golf courses.
≥ 40 respondents suggested subjecting the following project types to a specified criteria/threshold:
business parks
golf courses
meat processing plants
masts for mobile phones and radio or telecommunication stations

Table 16 Project types proposed for inclusion in both annexes to the EIA Directive

Furthermore, some pertinent arguments were presented, such as the need for clarification regarding the minimum number of criteria to be met in order to decide upon mandatory EIA.

On the other hand, some respondents called for the need to review the present threshold setting approach in order to prevent the evasion from EIA by staying just below inclusive thresholds or through *salami slicing* the projects at an early stage. Others also referred to the insufficient capacity for dealing with changes and extensions to existing installations.

Thresholds were also discussed. Some respondents suggested the use of new types of threshold values/criteria, such as *production output*, once directly related to emissions or waste generation. A need for using different criteria was mentioned for project categories such as *metal processing*, *plastic production* and *golf courses*.

As for suggested threshold values, objective and straightforward proposals are hardly possible. Apart from the different relative weight of a given threshold value in different countries (as may be the case of area-based criteria), threshold setting will always take place in a political context.

The need for a clearer definition was also referred to, especially for the case of *urban development projects*, *clear-cutting*, *waste management installations*, *shipping lanes*, *water management facilities* and the *production and storage of chemicals*. In the case of urban development projects, these were regarded as more adequately assessed through Strategic Environmental Assessment (SEA), which is seen additionally as a means to make up for some of the present shortcomings of the present EIA Directive.

Research on the relationship between mandatory and screening lists, project types adopted and thresholds and criteria setting enabled the comprehension of present shortcomings – perceived and described by the addressed stakeholders – in terms of the screening procedures practiced by MSs.

4.2.2 Discussion

A successful implementation of the Directive may depend to a considerable extent upon the ways in which Member States choose to select Annex II projects to be submitted to assessment. Differing approaches have been adopted by the various Member States in determining which projects should be subject to the EIA process and the circumstances under which they can be excluded. A further determinant of successful implementation may well be the extent to which Member States set the information requirements above the minimum prescribed, both for the screening decisions and for the environmental impact statements.

The analysis results of this study mainly give the impression that EIA experts are in general satisfied with the present system at the EU and national/regional levels, both regarding legal provisions to encompass all projects which may have significant environmental impacts and present definitions and criteria.

Even if no statistically significant results were possible, given the small sample size and discrepant results obtained in terms of number of responses to the questionnaire per country (the UK and Slovakia account for as much as 30% of total questionnaire returns), the combination of desk research outcomes with questionnaire and interview results allowed the definition of major trends regarding most of the issues focused on this analysis. However, many other responses were varying giving no clear pattern.

From the analysis of the Questionnaire and Interview feedback some correlation between the answers could be found identifying the following themes which seem to demonstrate barriers to successful EIA practice within the scope of this study:

- Diverging levels of environmental protection due to the present disparities in screening procedures among MSs;
- Ambiguous screening procedures (lack of transparency in screening decisions, lack of qualitative screening criteria);
- Some interpretational problems within certain sectors;
- Problems in dealing with cumulative effects;
- Developer's tendency towards staying just below the threshold value for EIA obligation; and
- Role of national/regional specificities not only regarding the geographic circumstances and the state of the environment, but also the political and commercial influence in implementing regulations.

Furthermore, it was possible to show similarities in the responses regarding potential solutions to tackle identified weaknesses such as:

- Specification of selection criteria for screening and clearer advice for practical application;
- General case-by-case analysis with robust selection criteria rather than setting fixed threshold values (corresponding to "salami-slicing", developers' tendency to stay just below value, etc.);
- Reducing overlaps in licensing procedures through enhanced co-ordination with other related Directives;
- Demand for adequate reference to the actual impacts on the environment in setting thresholds values rather than focusing on values responding to the project details;
- Providing more specific guidance;
- Knowledge sharing and greater diffusion of good practice;
- The strengthening of provision for EIA training;
- Introducing SEA is expected to become a helpful tool to tackle some of the above mentioned issues.

In general, the harmonization of screening procedures is regarded as advantageous by most of the respondents given the present disparities in screening procedures among MSs. Converging levels of environmental protection as well as more straightforward screening methods are the main reasons supporting the increasing harmonization of EIA practice among MSs.

In spite of the relative advantages of each of the proposed modifications to the present Annexes system, it has been argued that the simplification of the Annexes system would cause several legal administrative and technical problems, besides the political cost of introducing new amendments to the Directive.

EIA procedures are applied to a greater or lesser extent within development control and physical land-use planning systems, which remain national prerogatives (Glasson & Belanger, 2003). Given the considerable differences among EU planning systems and administrative practice concerning licensing procedures, it is still very difficult to foresee what a uniform European EIA system might look like. In addition, a number of countries (e.g. Belgium, Spain and Italy) have EIA regulations enacted at regional level, which makes the simplification of EIA (screening) procedures an even more difficult task.

On the other hand, discretionary judgement by the local EIA authorities will hardly cease to exist, given different environmental and social specificities, particularly in the cases of impact accumulation and sensitive areas. Case-by-case assessments, taking into account specified screening criteria (Annex II of the EIA Directive plus guidance produced at national level) was referred to by the great majority of the respondents as the only means to account for local conditions to properly forecast the environmental effects of a certain development project. In fact, as Weston (2000) suggests regarding the British case, "*while indicative thresholds can help the process, much of screening still relies upon professional judgement*"[5] (page 197).

But most important of all is to realise that impact significance assessment involves the use of both *predetermined* criteria (previously established) and *judgemental* criteria (Weston, 2000), even when setting up threshold values, as Wood & Becker (2005) point out. Deciding e.g. upon the number of sows a pig farm must have in order to be subject to an EIA procedure will always be a political decision, based on social, economic and cultural values besides scientific knowledge (Wood & Becker, 2005). Impact significance chiefly depends on the perception of the risks a certain project development poses to the environment. Public concern and pressure can thus lead to subjecting certain projects to EIA, despite their exemption according to more traditional screening criteria evaluation (Gonçalves, 2002; Wood & Becker, 2005).

Most countries (e.g. Austria, Czech Republic, Denmark, Hungary, Latvia, Malta, Portugal, Slovenia, Spain and Sweden) have introduced additional project types to their screening lists or set stricter threshold values above which EIA is mandatory in all cases. The growing experience in EIA practice has led to an increasing demand for environmental protection as well as to a better understanding of environmental processes and their relationship towards development projects.

Considerations of amendments to the EIA Directive should incorporate some of the above mentioned suggestions towards a more harmonized EIA practice among MSs, but may hardly and questionably lead to the complete simplification of (screening) procedures. In other words, present

[5] Weston, J. (2000): EIA, Decision-making Theory and Screening and Scoping in UK Practice – Journal of Environmental Planning and Management, 43(2), 185–203

screening arrangements have an important room for improvement, albeit keeping the existing rationale, i.e., maintaining a *controlled flexibility* through the two Annexes system.

Despite the obvious scope for improvement in the above mentioned issues of concern, it is noteworthy that any change to the Directive or any other regulation should be considered carefully. This study can only offer some advice in this field. Further investigations particularly focusing on technical details would be needed to underpin the need for taking action, in terms of how the identified concerns could be efficiently solved.

In the short term, some weak points of the European practice in the use of EIA could be tackled with non-legislative actions, such as greater diffusion of good practice, better provision and use of EIA guidance, better focused EIA research and the strengthening of provision for EIA training.

In due course, a well justified amendment of the EIA Directive could be necessary to further support the successful application of EIA in Europe.

4.3 Policy Options

4.3.1 Introduction

Based on the findings of the desk research and the analysis of the empirical data, this chapter presents a series of policy options. They follow a line from “zero action/do nothing” to “radical change”, accounting for different levels of improving EIA practice. Beginning with changes to the screening criteria set in Annex III, major amendments imply changes first to Annex II and then to Annex I of the present Directive.

They aim at tackling the identified weaknesses of the current European EIA practice in terms of covering human health issues and at overcoming the most important barriers. They also attempt to build on and advance the partly existing strengths.

Building on the IMP3 research results, six policy options have been developed:

- Policy option 0: Zero option: ‘Do nothing’
- Policy option 1: Guidance plus supportive measures
- Policy option 2: Minor amendment to the EIA directive plus supportive measures
- Policy option 3: Moderate amendment to the EIA directive plus supportive measures
- Policy option 4: Major amendment to the EIA directive plus supportive measures
- Policy option 5: Radical amendment to the EIA directive plus supportive measures

Each policy option contains a combination of supportive and regulative measures, which should be seen as potential examples of actions that could be taken by the Commission to enhance the Directive’s application in terms of proper assessment of projects likely to cause adverse impacts.

Advantages and disadvantages of each Policy Option are described in terms of a SWOT-Analysis, enabling the distinction between positive and negative issues regarding both the EC and the MSs’ perspective of MSs.

4.3.2 Policy Option 0: Zero option: No change/do nothing

The “zero” option assumes no changes to the present EIA Directive. Screening will continue to be based on the present Annexes system, types of projects listed in Annex I+II to the Directive will not be changed and present criteria/thresholds and definitions used in the Directive will persist. The SWOT-Analysis for this policy option is presented in Table 17.

SWOT-Analysis Policy Option 0: Zero option: No change/do nothing	
Strengths	Weaknesses
▪ No cost ▪ No additional work required ▪ No political bargaining ▪ No change to legislative, guidance and institutional frameworks ▪ Comfortable to most MSs as existing systems can be kept	▪ No progress or slow progress ▪ Diverging approach across Europe ▪ No adjustment to technical developments regarding adapting certain thresholds and/or introducing new project types ▪ Missing links to the requirements derived from other Directives such as remaining overlaps ▪ Missing co-ordination with requirements of the SEA Directive ▪ Uncertainty remains in interpreting certain definitions ▪ Legal uncertainty for screening decisions remains ▪ Heterogeneous implementation among Member States will continue to cause problems in the transboundary context
Opportunities	Threats
▪ The present situation allows for a certain degree of freedom of MSs in defining their national screening system such as keeping the screening system according to national/regional EIA procedures ▪ The determination of different screening systems enables the consideration of national specificities ▪ Coverage of project types subject to EIA results from taking national/regional specificities into account ▪ MSs have to account for potentially adjusting the setting of criteria and/or thresholds due to national/regional frameworks ▪ Further experience with present application can be gained ▪ By keeping the present regulatory system resources can be used for improving EIA practice	▪ ECJ such as national court rulings are often needed – time- and cost- intensive ▪ Lack of more specified screening criteria gives rise to situations of infringements among MSs ▪ Lack of harmonization between screening systems among MSs creates problems in the case of projects causing transnational impacts; ▪ Level of dissatisfaction with application increases for certain issues ▪ Application does not fulfil the purpose of the Directive anymore throughout all MSs ▪ Double assessments through obligations from other Directives and/or regulations ▪ New project types with likely significant effects will not be covered

Table 17 SWOT-Analysis for Policy Option 0: “Zero option: No change/do nothing”

Policy Option 0 implies no effort towards the harmonization of screening procedures and, thus, no additional legislative and administrative costs of additional changes to national EIA regulations. On the other hand, no improvements to present EIA practice shall result in the persistence of present shortcomings regarding considerable disparities in screening procedures, with very different criteria and threshold values applied to the same types of projects among MSs.

No introducing changes in the short term can always lead to the maturation of present EIA systems and, thus, to the improvement of national screening and public discussion procedures. However, postponing the necessary amendments to the present annexes system can also lead to increasingly divergent EIA screening methods, especially concerning their relationship to land-use planning procedures, which remain national prerogatives.

4.3.3 Policy Option 1: Guidance plus supportive measures

Key issues: enhancement of existing guidance and/or elaborating new guidance

This Policy Option concentrates on "soft" measures to enhance the application of the Directive with regard to the WP focus without changing it as such. This would include a revision of the existing EIA – Guidance on Screening (EC, 2001) such as the screening checklist and the preparation of new guidance for clarifying certain definitions (also with respect to co-ordination with other relevant EU Directives) and/or the application of project types (Annex I & II). In addition, new guidance would also refer to the selection criteria applied to Annex II projects (Annex III). New guidance for accumulation assessment with particular regard to linkages to the SEA directive could also be considered. All guidance material should be translated into all MSs languages.

Enhancement of existing guiding material should focus on:

- Improving and extending the existing EU EIA Guidance on Screening – update of the screening checklist
- Improving and extending the existing EU EIA Guidance on Scoping
- Review of the guidelines on the Assessment of Indirect and Cumulative Impacts as well as impact interactions
- Review of the EU EIA review checklist with particular regard to linkages to SEA
- Improved definition of "sensitive areas" – link to Habitats Directive

Developing **new guidance** should in general address the following issues:

- Co-ordination with other Directives through clear interpretations or additions to varying definitions to avoid overlaps and support a mutual complement (potentially over IMPEL Network)
- Harmonization of the EIA Directive with the relevant international conventions and agreements regarding lists of project types and descriptions
- Licensing procedures (e.g. different procedural approaches for small/large facilities)
- Improved application of screening criteria
- Cumulative effects assessment
- EIA Follow-up and Monitoring
- Biodiversity and EIA

Policy Option 1 will also cover further potential supportive measures, which the Commission could consider to engage in, such as offering training for implementation and knowledge sharing.

Training could address:

- Screening as part of the EIA process with emphasis on improving the practical application
- Managing effective environmental assessments, including:
  - scoping,
  - identifying and predicting environmental effects,
  - evaluating significance,
  - reporting EIA findings,
  - involving the public,
  - mitigating environmental effects, and
  - quality assurance.
- Public participation
- E-learning

Knowledge Sharing by establishing a platform for dialogue and information exchange that could take place at different levels:

- Interactive internet platform as a discussion forum
- Establishing Stakeholder dialogue through organizing workshops (capacity building)
- Funding research activities on selected issues (deriving from Internet Platform and/or Stakeholder Dialogue)
- Building up a database with relevant material provided by MSs, running on the EC website and providing resources to keep this database updated
- Encouraging MSs to provide information for distribution in English
- Reactivating EIA centres as national Information-Centres such as searching for existing structures and information lines (e.g. IAIA society, conferences, networks) and using them.

Table 18 presents the SWOT-Analysis for this Policy Option.

SWOT-Analysis Policy Option 1: Guidance plus supportive measures	
Strengths	**Weaknesses**
▪ Builds on what already exists ▪ Commission takes a significant leadership role ▪ Likely to be cost-effective in terms of the time, money and personnel involved and the likelihood of improvement ▪ Supports Member States' progress and therefore likely to be taken up by most stakeholders ▪ Builds on and uses existing regulatory and institutional frameworks ▪ Flexibility in the implementation of Directive would still be preserved	▪ Long term financial, personnel and resource support needed ▪ Lack of legal clarity ▪ Diverse interpretations of guiding material could again lead to uneven implementation ▪ Lack of visibility on the political agenda
Opportunities	**Threats**
▪ Increases and enhances co-operation between EU Directorate Generals (DGs) and between Member States ▪ Member States can continue to develop at their own pace and in a way that suits their own national circumstances ▪ Could Improve EIA practice significantly ▪ Member States can use support to enhance their own national guidance ▪ Clarification regarding application of criteria such as for project type definitions through improved guidance material and other supportive measures would guarantee more reliance in EIA procedure ▪ Improved Guidance on the screening system would ensure a certain degree of harmonization between MSs ▪ Enhancement of guiding material could reduce conflicts arising from projects likely to generate transnational impacts and from transnational projects subjected to EIA ▪ Provides an opportunity to bring together, review and highlight best practice at the EU and international level (Knowledge sharing!) ▪ Specifying the set of criteria and providing guidance on how to apply those will contribute to a more harmonized implementation dealing with certain project categories	▪ No or slow progress in some Member States because these are supporting measures and guidance only ▪ Improved guidance will not be taken up by Member States ▪ Continuing potential for divergent progress between Member States ▪ Practice does not significantly change across the EU ▪ New guidance continues to be ignored and underused ▪ Take-up of supporting measures and new guidance is dependent on willingness and active interest of Member States and EIA stakeholders

Table 18 SWOT-Analysis for Policy Option 1: Guidance plus supportive measures

Policy Option 1 is adequate for the short to medium term. Improved guidance in terms of project types definition and screening criteria can lead to less divergent EIA practice among MSs with little disturbance of national legal and administrative EIA systems. The requirements of Section 6, Art. III-185 of the European Convention in terms of improving the system of information exchange across the Member States and the Union, as well as supporting training schemes and provisions for administrative cooperation could also ease the implementation. However, it implies additional costs, if well applied.

4.3.4 Policy Option 2: Minor amendment to the EIA directive plus supportive measures

Key issues: Annex I+II remain untouched; changes to Annex III combined with supportive measures

Policy Option 2 suggests to keep Annex I and II according to the present EIA Directive and introduce an extended set of project selection criteria in Annex III. This option would also reflect risk and health concerns, the emergence of new types of projects, the introduction of the SEA Directive and the opportunity to align selection criteria with other environmental policy Directives. In addition to changing Annex III, this option would also contain relevant supportive measures mentioned in Policy Option 1.

Introducing an extended set of selection criteria in Annex III would have to include considerations about:

- Determination of **significance**[6], i.e. whether a project is likely to cause significant adverse environmental effects. This should in general include:
  - Criteria for deciding whether the environmental effects are adverse (e.g. through comparing the quality of the existing environment with the predicted quality of the environment once the project is in place using certain indicators);
  - Extended Set of Criteria for deciding whether the adverse environmental effects are significant (adding provisions to use environmental standards, guidelines or objectives – e.g. if the level of an adverse environmental effect exceeds the standard, guideline or objective, it may be significant; introducing quantitative risk assessment criteria (including health concerns);
  - Criteria for deciding whether the significant adverse environmental effects are likely to occur (in addition to the probability of occurrence – also combined with quantitative risk assessment (also including health concerns) – the scientific uncertainty should also be taken into account and weighted)
- Methodological approach for the **screening decision**
  - Basic provisions for how to use screening criteria to make a transparent and thorough decision

Guidance and supportive measures to changes to Annex III could particularly address methodological approaches for the screening decision. Provisions for a more profound and unified approach in selecting project types to be subjected to EIA will likely contribute to a more harmonized application of the Directive. It would also provide for a higher legal certainty for the screening decisions. Guidance could be elaborated by establishing a working group with representatives of all Member States to build on existing knowledge and experience.

6 Following the approach for deciding whether a project is likely to cause significant environmental effects under the Canadian Environmental Assessment Act; Canadian Environmental Assessment Agency (1994): Reference Guide: Determining Whether A Project is Likely to Cause Significant Adverse Environmental Effects.

In addition to the above mentioned key issues of Policy Option 2, the Commission could also consider to implement provisions for e.g. elaborating guidance notes and/or regulations in the Directive. This would mirror a more regulative approach for the considered changes and it would provide an option to bind Member States to following a certain way of implementation.

SWOT-Analysis Policy Option 2: Minor amendment to the EIA directive plus supportive measures	
Strengths	Weaknesses
▪ Easy to implement by MSs ▪ Contributes to further harmonization of the EIA application throughout MSs ▪ Introduces new and clearer concerns on e.g. health and risk ▪ Is able to address the necessary coordination of EIA and SEA procedures concerning the selection of projects for assessment ▪ Adapts existing selection criteria to the emergence of new project types	▪ Requires an amendment to the present EIA Directive ▪ Doubtful cost-effective results in view of the likely minor changes ▪ Likely modest results in terms of the harmonization of screening procedures among MSs
Opportunities	Threats
▪ Keeps a flexible approach to screening, updating and enlarging the respective selection criteria ▪ Provides an additional tool to align EIA with other environmental policy Directives/regulations (particularly SEA) ▪ Provides for a higher legal certainty for Member States for their screening decisions ▪ Simplifies the process of excluding those projects for which EIA is clearly not required ▪ Constitutes a firmer basis for screening decisions which reduces administrative burden for competent authorities ▪ Provides for a more robust and transparent approach in defining project types with likely significant effects ▪ Seizes the chance to reduce possibilities to circumvent EIA obligations	▪ May result in irrelevant changes to existing national EIA legislations ▪ Likely negative reaction from MSs that will be faced with the need to change existing legislation in minor aspects ▪ Denial of acceptance in Member States to implement changes which likely interfere with national/regional screening system ▪ Revising the Annex III to the EIA Directive's may hold the risk that other issues could be put on the political agenda, potentially leading to additional changes

Table 19 SWOT-Analysis for Policy Option 2: Minor amendment to the EIA directive plus supportive measures

Changes to Annex III to the EIA Directive as proposed by this policy option comprise a possible solution to the different interpretations of the present definition of project types in both Annex I and Annex II. It also provides guidance for general screening procedures, which should contribute to clearer screening rules and outcomes. Its focus is on health and environmental risk assessment, among other relevant issues and allows for additional enhancement of overall EIA practice.

Such changes may also trigger future amendments to national legislations concerning the alignment of EIA with other Directives and European Regulations, such as the SEA or the IPPC Directive, which would make major amendments to the present annexes system easier to implement in the medium to long term.

Policy Option 2 must be regarded as a modest contribution to the overall improvement and harmonization of the implementation of the EIA Directive by MSs, given remaining disparities regarding the lists of projects and threshold values setting.

4.3.5 Policy Option 3: Moderate amendment to the EIA directive plus supportive measures

Key issues: Annex I remains untouched; changes to Annex II regarding change of listed project types combined with supportive measures and relevant changes to Annex III

Policy Option 3 proposes a revision of the list of project types included in Annex II, reflecting the emergence of new project types with likely significant impacts, and/or if applicable, a reclassification of other project types with minor relevance regarding their significant impacts. In particular a revision should also address an enhanced linkage of the EIA and SEA directive (e.g. removal of project types/activities from the EIA requirement, which should rather be assessed through SEA) and/or harmonization with other related Directives. Policy Option 3 would also recommend to combine changes to Annex II with a revision of Annex III such as supportive measures. Therefore Policy Option 3 includes all relevant actions proposed in Options 1 and 2. Annex I would remain unchanged.

A revision would in particular address:

- Review of project categories listed in Annex II considering:
  - emergence of new types of projects with likely significant impacts and/or
  - reclassification of other project types with minor relevance regarding their significant impacts and/or
  - determination of thresholds for certain Annex II project categories (e.g. holiday villages, construction of roads, associated developments for tourism and leisure) with particular regard to potential overlaps to Annex I categories.

The following new projects categories could be formed, considering both (IMP)[3] questionnaire returns and the Commissions 5 years' report[7] results:

[7] Report from the Commission to the European Parliament and the Council on the application and effectiveness of the EIA Directive (Directive 85/337/EEC as amended by Directive 97/11/EC). How successful are the Member States in implementing the EIA Directive.

Additional project categories suggested within (IMP)³ and the 5 years report		
Project category	Suggested by the majority[8] of Stakeholders addressed within IMP³	Suggested by MSs mentioned in the 5 years report
Golf courses	X	X
Installations working with certain Genetically Modified Organisms (GMOs) or pathogenic micro-organism such as laboratories, test facilities, trial areas	X	X
Military practice grounds	X	X
Masts for mobile phones and radio or telecommunication stations	X	X
Business parks	X	
Redevelopment of contaminated land	X	
Transhipment depots	X	
Installations for the manufacture of particle and fibreboard		X

Table 20 Additional project categories suggested within IMP³ and the 5 years report

SWOT-Analysis Policy Option 3: Moderate amendment to the EIA directive plus supportive measures	
Strengths	Weaknesses
▪ Substantial demonstration of the Commission's commitment to improving environmental protection ▪ Member States obliged to take action ▪ Supports Member States' progress ▪ Likely to provide for a more consistent approach across Member States.	▪ More effort and financial and personnel resources needed than Options 1 and 2 ▪ Will take longer to implement than Options 1 or 2 ▪ Politically more sensitive than Options 1 and 2 ▪ Reconcilement of national interests could be difficult.
Opportunities	Threats
▪ Deeper and more sustained progress in EIA process. ▪ Will drive change and hence be more effective than Options 1 and 2 ▪ Supports better co-ordination between Member States, in particular regarding the transboundary sector.	▪ Some Member States and EIA stakeholders are likely to be very resistant to amending the Directive ▪ Changes to the Directive may still lead to little improvement in EIA practice within Member States

Table 21 SWOT-Analysis for Policy Option 3: Moderate amendment to the EIA directive plus supportive measures

[8] „Majority" refers to: Ticked in the Response to the Questionnaire by more than 40% of the Stakeholders and mentioned by at least two Interviewees. Project categories mentioned either only in the Responses to the Questionnaire or by Interviewees are not listed here.

Given the proposed changes to the list of projects in Annex II and the combined measures outlined in Policy Option 2, significant improvement to EIA application is to be expected, through a more consistent approach among MSs and thus more effective in terms of a deeper harmonization of screening procedures. However, it still does not allow for the mandatory assessment of certain additional project types, which, given their significant impact on the environment, would justify an EIA process.

It is therefore necessary to consider very carefully the required effort and expected outcome in terms of a more consistent and comprehensive set of project types with likely significant adverse effects.

4.3.6 Policy Option 4: Major amendment to the EIA directive plus supportive measures

Key issues: Changes to lists of project types in Annex I & II, including a revision of all project type descriptions, thresholds, and the selection criteria to be applied (Annex III) combined with supportive measures.

Policy Option 4 proposes a revision of the lists of project types included, at present, in Annex I and Annex II, with possible reallocation of project types between these two Annexes and/or introduction of additional project types, reflecting the emergence of new project types as well as the possible reclassification of project types with minor relevance regarding their significant impacts. Furthermore, a revision would in particular address linkages to the SEA Directive.

The revision should address:

- Review of project categories listed in Annex I+II considering:
  - Linkages to other Directives and in particular the SEA directive;
  - emergence of new project types to be added;
  - reclassification of project types with minor relevance regarding their significant impacts.

  At present, the SEA- and EIA-Directives are only directly linked in one way (article 3(2) of Directive 2001/42/EC requires SEA for those plans and programmes, which set the framework for future development consent of EIA projects). Having the concept of tiring in mind, a linkage of SEA- and EIA-Directives regarding the assessment of activities with likely adverse effects on the environment could consider the following issues:
  - Raising the assessment of cumulative impacts, indirect effects and large-scale effects to the strategic level and unburden EIA procedures – removal of categories, where such impacts are likely inherent (e.g. urban development, major wind farms);
  - Special provisions for the transport sector.

This option would also be combined with a revision of Annex III, taking all relevant actions of Policy Options 1 and 2 into account and implement further supportive measures.

A consideration of adding new categories to the Directives Annexes could follow the suggested project types listed under Policy Option 3. Within these categories Table 23 shows suggestions, made by IMP³ Stakeholders for which project types an assessment should be mandatory and/or should be subject to a specified criteria/threshold.

Allocation for suggested project categories in "mandatory" and/or "subject to a specified criteria/Threshold		
Project category	Mandatory assessment	Subject to a specified criteria/threshold
	Suggested by the majority of stakeholders addressed within IMP³ and MSs in the 5 years report	
Golf courses		X
Installations working with certain Genetically Modified Organisms (GMOs) or pathogenic micro-organism such as laboratories, test facilities, trial areas	X	
Military practice grounds	X	
Masts for mobile phones and radio or telecommunication stations		X
Business parks	X	X
Redevelopment of contaminated land	X	X
Transhipment depots		X
	Suggested by MSs mentioned in the 5 years report	
Installations for the manufacture of particle and fibreboard	X	

Table 22 Allocation for suggested project categories in "mandatory" and/or "subject to a specified criteria/Threshold"

- Review of the present project type definitions and thresholds:
  The need for a review arises from concerns that, in the past, incomplete or unclear project descriptions have led to legal uncertainties in the screening decisions. Annex I threshold set does not seem to provide the right trigger in some cases. Effective project descriptions bring greater efficiency and predictability. Well-defined project descriptions will also contribute to connect the various planning levels.
  [*Annex I of the WP4 report shows a table which could provide a basis for considerations regarding a revision of Annex I project definitions. It contains relevant project definitions from other directives, guidance materials from other sources and identifies open questions for further elaboration.*]

- Revision of Annex III as suggested in Policy Option 2
  A Revision of Annex III should include the actions proposed in Policy Option 2 with additional criteria linking the strategic (SEA) with the operational (EIA) level, such as e.g.
  – Proposed development activity shall be (originally) included in the relevant plans and programmes.

This would strengthen SEA while at the same time unburden EIA.

SWOT-Analysis Policy Option 4: Major amendment to the EIA directive plus supportive measures	
Strengths	**Weaknesses**
▪ Member States obliged to take action ▪ More consistent decision-making across Member States ▪ Respond to MSs concerns about certain vagueness in project type descriptions ▪ Alignment of the EIA Directive's Annexes to other Directives ▪ Adjustment to technical developments regarding adapting certain thresholds and/or introducing new project types	▪ Major effort and resources needed ▪ Political bargaining will be necessary ▪ Long time span has to be calculated until changes become effective ▪ Difficult to establish and agree upon robust thresholds/criteria for new project categories
Opportunities	**Threats**
▪ Allows for greater harmonization regarding coverage of project types with likely adverse significant effects on the environment ▪ Better co-ordination with other Directives will consolidate licensing procedures and therefore reduce duplication and overlap with other approval systems ▪ Particularly a closer linkage of SEA and EIA through an efficient tiring concept will avoid duplication in the production of knowledge ▪ Effective project type descriptions will allow for higher legal certainty in the screening decision and thus contribute to saving of time and cost for the competent authorities ▪ Contributes to an improved application of EIA in the transboundary context	▪ Some Member States and EIA stakeholders are likely to be very resistant to amending the Directive ▪ Transposition of the amendments and necessary alignments to national framework could produce further inhomogeneous application

Table 23 SWOT-Analysis for Policy Option 4: Major amendment to the EIA directive plus supportive measures

Policy Option 4 constitutes a more significant step in dealing with identified weaknesses in present EIA application and practice, allowing at the same time a better coordination with other Directives, in particular with SEA.

If such proposed changes to the Directive are to be considered, it is important to start as soon as possible as a long time span has to be calculated until changes become effective. A stakeholder conference ("Think-tank") could be a starting point to gather expert knowledge and experience. This could reduce the inherent weakness of this option regarding resource and cost intensity through building on existing expert skills.

The most difficult threat to overcome is getting political support and endorsement from the Member States, which is vital for negotiating changes and introducing them into national frameworks.

4.3.7 Policy Option 5: Radical amendment to the EIA directive plus supportive measures

Key issues: Abolishing Annex II entirely with consequential changes to Annex I leading to a simplified list of projects with indicative or guidance thresholds and criteria, where EIA must be considered. Additionally, inclusion or mandatory thresholds and criteria, where EIA is required combined with necessary supportive measures.

Policy Option 5 proposes an introduction of a new screening procedure, based on a single list of project types (an enlarged version of present Annex I), with indicative or guidance thresholds and criteria where EIA must be considered, and inclusion or mandatory thresholds and criteria, where EIA is required following the so-called "traffic light approach"[9]. For each listed project category mandatory criteria/thresholds would be set, where projects above these thresholds will require mandatory assessment. Projects below the mandatory thresholds need a case-by-case examination undertaken by the competent national authority, which must formally decide whether or not a project would or would not be likely to have significant effects on the environment. It could be left optional for Member States to additionally introduce exclusion criteria/thresholds, where projects below these thresholds will not require EIA. Exclusion thresholds will need to take into account not just the scale of any development but also the sensitivity of its location and other criteria (e.g. cumulative effects) in Annex III.

All criteria/thresholds must be precisely defined for each project category, with the intention to be applied by all Member States. National legislation and regulations could in any case, add other categories to this European list, defining for these categories, similar or different EIA procedures according to national and regional circumstances and EIA practices.

A single list of projects would reflect an analogous approach such as that used in other related EU Directives and a closer linkage of the screening procedure with the actual impacts on the environment. Indicative criteria and thresholds would also leave the flexibility to adjust Member States legislation and regulations to national and regional circumstances and EIA practices. This radical change of the present Annexes system would by all means need supportive measures such as new guidance and training.

9 'traffic light' approach to screening: combination of inclusion thresholds (EIA always required – Red), exclusion thresholds (EIA never required – Green) and indicative or guidance thresholds (EIA may be required – Amber). (see also: Report from the Commission to the European Parliament and the Council on the application and effectiveness of the EIA Directive (Directive 85/337/EEC as amended by Directive 97/11/EC). How successful are the Member States in implementing the EIA Directive, p.3).

SWOT-Analysis Policy Option 5: Radical amendment to the EIA directive plus supportive measures	
Strengths	**Weaknesses**
▪ Leads to a deeper harmonization of screening procedures among MSs ▪ Allows for EC's broader control over the EIA system of MSs ▪ Provides economic agents with similar competition conditions throughout the European market ▪ Reflects an analogous approach used in other related Directives ▪ Reduces overlaps with other related approval systems ▪ Constitutes a robust and transparent system	▪ Is bound to further increase the selectivity of the EIA process (a single annex is likely to have fewer project types than the present Annex I + Annex II) ▪ Shows less flexibility inherent to the application of different criteria and thresholds ▪ Difficult to implement by MSs ▪ Reduces the scope to address cumulative impacts generated by close-by developments
Opportunities	**Threats**
▪ Reduces misunderstandings in transboundary conflicts ▪ Leads to a higher environmental protection ▪ The need to assess on a case-by-case basis whether or not a project needs EIA in case it falls below the thresholds defined in the single list will result in a more responsible and proactive role of environmental administration	▪ It is likely to attract significant opposition of MSs ▪ May lead to an overload of administrative work in the case of those MSs with centralized EIA administrative procedures with little experience in case-by-case assessments ▪ May reduce the discretionary powers of MSs environmental authorities in an environmental policy tool that is expected to promote public participation in decision-making

Table 24 SWOT-Analysis for Policy Option 5: Radical amendment to the EIA directive plus supportive measures

Abolishing Annex II corresponds to the loss of flexibility concerning the way different project types are regarded and dealt with by each MS.

The increase of the number of projects subjected to mandatory EIA, as well as the possibility for case-by-case analysis in those countries where this is a seldom applied screening method may result in a more demanding Directive and thus in higher levels of environmental protection. It might also lead to a more active role played by EIA authorities in case-by-case analysis.

However, given the risk of serious disruptive effects over national legal systems, Policy Option 5 constitutes a highly demanding amendment to the present Directive perhaps too ambitious and unrealistic in terms of acceptance across the EU 25.

5 CONCLUSIONS

Through targeted research of the three distinct topics “human health”, “risk assessment” and “projects subject to EIA”, (IMP)3 contributes to the policy-making process at EU level, in order to improve the application of EIA by presenting a set of policy options for each of these thematic issues.

These policy options have been conceived and evaluated as separate sets of possible courses of action to be taken by the European Commission, to better exploit the full potential of EIA as an effective instrument of preventive and precautionary environmental protection. They are designed to tackle the identified weaknesses of the current European EIA practice, to overcome the most important barriers going way forward and to build on and advance existing strengths.

Since the options are diverse and comprise the whole range of potential measures that could be taken at the European level, including both “soft” and legislative courses of action, they can be applied at different levels of EIA reform, be they environmental, socio-economic or political. The following figures synthesise these policy options for the topics of Health (WP2), Risk assessment (WP3) and Projects subject to EIA (WP4).

Table 25 WP2 – Policy Options on the Health aspects

	Policy option (European policy level)	**Supportive measures**					**Regulative measures**		
		Amendment of guidelines, and passive dissemination activities	Training	Active awareness raising campaign	Research funding, and targeted research	Monitoring progress in MS	Minor amendments to EIA Directive	Major amendments to EIA Directive	New HIA Directive
0	**Do nothing**	-	-	-	-	-	-	-	-
1	**Preparation of new guidance package**	×							
2	**Supporting measures plus preparation of new guidance package**	×	×	×	×				
3	**Minor amendments to EIA Directive plus supporting measures plus guidance package**	×	×	×	×	×	×		
4	**Major amendment to EIA Directive plus supporting measures plus guidance package**	×	×	×	×	×		×	
5	**New HIA Directive**	× [1]	×	×	×	×			×

Table 26 WP3 – Policy Options on Risk assessment

Policy option [European policy level]		Guidance		Supporting measures								Regulatory measures		
												Other	Amendment to EIA Directive	
		Upgrade	New guidance	(Preparatory) consultation process	Dissemination activities	Awareness-raising	Training, education	Knowledge-sharing	Research	Coordination of procedures	Specific implementation support	New Directive on Hazard Mapping	Moderate	Major
0	**Do nothing**	-	-	-	-	-	-	-	-	-	-	-		-
1	**Guidance 'light'**	X												
2	**Preparation of new technical guidance package plus pro-active dissemination activities**	(X)	X	X	X									
3	**Set of supporting measures**					X	X	X	X					
4	**Launching a risk assessment initiative with a broader perspective**			X				X	X	X		X		
5	**Moderate amendment to EIA Directive plus new technical guidance package plus support for implementation**	(X)	X	X	X	(X)	X	X	(X)	(X)	X	(X)	X	
6	**Major amendment to EIA Directive plus new technical guidance package plus support for implementation**	(X)	X	X	X	(X)	X	X	(X)	(X)	X	(X)	X	X

Legend: X **... obligatory measure;** (X) **... may be useful as complementary measure**

Table 27 WP4 – Policy Options on Projects subject to EIA

Policy option (European policy level)		**Supportive measures**				**Regulative measures**			
						Amendments to EIA Directive			
		Amendment of existing guidance material	New guidelines	Training	Knowledge sharing	Minor	Moderate	Major	Radical
0	**No change/Do nothing**								
1	**Guidance plus supportive measures**	X	X	X	X				
2	**Minor amendment to the EIA directive plus supportive measures**	X	X	X	X	X			
3	**Moderate amendment to the EIA directive plus supportive measures**	X	X	X	X		X		
4	**Major amendment to the EIA directive plus supportive measures**	X	X	X	X			X	
5	**Radical amendment to the EIA directive plus supportive measures**	X	X	X	X				X

The comparison of the policy options between the three thematic issues “human health”, “risk assessment” and “projects to EIA” shows that in the overall the format of the three sets of policy options is very similar, as in each field the options are designed to operate mainly along three major axes:

- guidance;
- supportive measures;
- regulatory or legislative measures.

Each bundle of 6 to 7 policy options includes the “zero option – do nothing” on the one hand, and extensive changes to the actual legislative situation on the other hand: a new “HIA Directive” in the field of “human health“, “Major amendment to the EIA Directive plus new technical guidance package plus support for implementation” concerning “risk assessment” and “Radical amendment to the EIA directive plus supportive measures” concerning “projects subject to EIA”.

This variety of options within each research field aims to support the European Commission in taking action on improving EIA application by providing an accurate, comprehensive, and yet flexible document, containing broad sets of possible paths of action.

The policy options are based on a technical and scientific analysis of the current situation, taking into account existing evaluation reports, the analysis of the existing legislation and literature, combined with empirical data from a questionnaire disseminated to European EIA stakeholders and from more than 50 interviews. While the structure of the policy options of each thematic issue is similar, the substance of the different options is very specific to each thematic field.

Concerning “human health”, the analysis of the present situation has shown that in general human health is referenced in EIA, but understood in a narrow way, and that the definition of “human health” varies and is generally vague and unspecific. Additionally, in some countries a Health Impact Assessment (HIA) has been developed. The main discussion about improving health issues in EIA is about the advantages and disadvantages of integrating health aspects into EIA versus undertaking separate and autonomous HIAs. The elaborated policy options reflect this discussion.

In a comparative analysis of approaches to “risk assessment”, the regulatory and legislative basis of risk assessment in national EIA systems and of the co-ordination mechanisms with other risk assessment procedures under sectoral national laws parallel to or separate from EIA, with particular regard to the IPPC, Seveso II and SEA directives, have been investigated. In general, risk assessment and risk management appear to be often a disaster-driven process, and the risk assessment process lacks a number of analytical key steps required for risk management decisions. As there is a need for the proactive integration of risk assessment into the EIA decision-making process, the policy options concerning “risk assessment” aim at improving the effectiveness of risk assessment in EIA..

The analysis of the “projects subject to EIA” has shown that the system of project types, thresholds and criteria for the screening process is felt to be satisfactory by most EIA stakeholders in the MS. However, there exist differences among the MSs in the set of thresholds/criteria and project descriptions that lead to a variety of EIA applications. One problem lies in the lack of accurate interpretation of screening criteria and a need for a closer linkage of thresholds/criteria with the actual impacts. Reflecting on this situation, the policy options in this field include soft measures,

such as training, in order to achieve a common understanding about details of EIA application throughout the European EIA applicants as well as a radical amendment to the EIA directive.

Each of the six or seven policy options provided for each topic, illustrates a particular path to improve the application of EIA. On the extremes, the zero option and the most ambitious, if not radical option presented for each research field clearly set the scene defining the outer boundaries of the discussion.

Between these “extreme” options in all three research fields at least one policy option is defined that contains a bundle of soft measures including the improvement of the guidance and additional supportive measures like e.g. training. Moreover, another type of policy option can be found in all three topics, which goes beyond technical guidance and awareness raising, and is characterised by modest or minor changes to the EIA Directive.

The set-up of the three different series of policy options allows implementing the options independently from each other, yet it offers high potential for an implementation in a combined and coordinated way. The different options elaborated separately within each thematic issue can be combined across the three fields “human health”, “risk assessment” and “projects subject to EIA”. For example, it is possible to take no action in the field of human health (health-option 0), to prepare a new technical guidance package including pro-active dissemination activities (risk-option 2) in order to improve the application of risk assessment, and to make radical amendments to the EIA directive according to “project types subject to EIA”.

However, all policy options except the zero option need the political agreement to take action in order to improve the application of EIA. As a modification of the EIA Directive would result in a modification of the national legislation in all 25 MSs, the policy options that include a change of the Directive require a strong political commitment to justify the heavy, complex and time consuming technical, and administrative processes needed.

For each of the policy options a SWOT-Analysis has been conducted, showing the strengths and weaknesses, opportunities and threats associated with each. This way, the SWOT-analysis helps to compare the pros and cons of each option as a basis for discussing its implementation. However, it can not substitute for a more thorough analysis, such as a cost-benefit-risk analysis, to be done on part of the Commission.

At the end of the day, a decision on how to improve EIA application in Europe, and especially a modification of the EIA Directive, is a truly political decision that requires a complex and diversified technical supporting framework. The SWOT analysis helps to structure the arguments, but a political decision is clearly beyond the remit of any research project.

All in all, the overall design of the (IMP)3 project, the theoretical, legal, regulatory and empirical evidence gathered and, in particular, the final evaluation of the range of policy options for each and every WP, was performed to and is expected to contribute to

- Enhancing the application and effectiveness of EIA as a preventive, precautionary, prospective and anticipative instrument;
- Responding to the scientific and technological needs of the European Commission to improve EIA as one of the most relevant environmental policy tools at European level;
- Building a more harmonised application of EIA in all Member States with positive results as far as European cohesion, equity and competitiveness are concerned, while providing for the necessary flexibility to accommodate for national and regional differences;
- Designing a robust and effective reform agenda for EIA closely linked with recent developments such as the Aarhus Convention and the implementation of the Strategic Environmental Assessment (SEA) Directive.

Based on the sound analysis of the legislative background and various empirical data from EIA stakeholders across Europe, the results of (IMP)3 shall provide decision support to the policy making process at Community level, contribute to an improved knowledge basis on EIA application and stimulate discussions within the European EIA community.

6 LITERATURE

6.1 Literature Chapter 2 “Human health”

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The Royal Town Planning Institute (Northern Ireland) (1999): Development Control Advice Note 10, Environmental Impact Assessment

The Royal Town Planning Institute (Northern Ireland) (2001): Environmental Impact Assessment – Planning Practice Standard.

Environment Agency (2002): Scoping Guidelines for the Environmental Impact Assessment of Projects.

HMSO (Her Majesty's Stationary Office) (1995): Preparation of Environmental Statements for Planning Projects that Require Environmental Assessment. Good Practice Guide.

HMSO (Her Majesty's Stationary Office) (1994): Evaluation of Environmental Information for Planning Projects. Good Practice Guide

Environmental Impact Assessment of Forestry Projects, issued by the Forestry Commission.

Scottish Executive Rural Affairs Department (1999): Guide to the Environmental Impact Assessment (Fish Farming in Marine Waters) Regulations 1999.

Environmental Assessment Guidance Manual for Marine Salmon Farmers (Crown Estate Commissioners in consultation with Scottish Executive).

DEFRA (Department for Environment, Food and Rural Affairs) (2002): Guidelines – Environmental Impact Assessment for Use of Uncultivated Land or Semi-natural Areas for Intensive Agricultural Purposes.

Canada

CEEA (Canadian Environmental Assessment Agency) (2003): Canadian Environmental Assessment Act: An overview.

CEEA (Canadian Environmental Assessment Agency) (1994): Reference Guide: Determining Whether A Project is Likely to Cause Significant Adverse Environmental Effects.

CEEA (Canadian Environmental Assessment Agency) (1999): Cumulative Effects Assessment: Practitioner's Guide.

Federal Environmental Assessment Review Office (1994): Reference Guide: Addressing Cumulative Environmental Effects.

Minister of Supply and Services Canada (1996): A Guide on Biodiversity and Environmental Assessment.

Health Canada (1999): Canadian handbook on health impact assessment.

USA

Natural Resources Authority (1997): Guidelines for Assessing Environmental Impact Assessments.

US EPA set of guidelines on applying environmental and ecological risk assessment:

US EPA (Environmental Protection Agency) (1992): Framework for ecological risk assessment. EPA/630/R-92/001. US Environmental Protection Agency, Washington, DC.

US EPA (Environmental Protection Agency) (1998): Guidelines for Ecological Risk Assessment. US Environmental Protection Agency, Federal Register 63(93): 26846-26924.

Guidelines for Carcinogen Risk Assessment.

Guidelines for Chemical Mixtures Risk Assessment.

Guidelines for Ecological Risk Assessment.

Guidelines for Neurotoxicity Risk Assessment.

Guidelines for Reproductive Toxicity Risk Assessment.

Guidelines for Exposure Assessment.

Guidelines for Developmental Toxicity Risk Assessment.

Guidelines for Mutagenicity Risk Assessment.

Guidelines for Exposure Assessment.

Guidance on Cumulative Risk Assessment.

Radiation Risk Assessment Guidance.

The Hazard Ranking System Guidance Manual.

6.5 Links to related sites

The homepage of the European Commission on EIA: http://europa.eu.int/comm/environment/eia/home.htm

The homepage of the European Commission on the Implementation of Environmental Law: http://europa.eu.int/comm/environment/law/index.htm

European EIA/SEA centres: http://www.europa.eu.int/comm/environment/eia/contacts2.htm

The homepage of the European Commission on European Environmental Communication Networks: http://europa.eu.int/comm/environment/networks/index_en.htm

The homepage of UN ECE Convention on EIA in a transboundary context: http://www.unece.org/env/eia/

The homepage of the European Court of Justice: http://curia.eu.int/en/index.htm

The homepage of the European Convention: http://curia.eu.int/en/index.htm

Manchester University EIA Centre (UK): http://www.art.man.ac.uk/EIA/eiac.htm

Netherlands Commission for EIA (Commissie MER): http://www.eia.nl/ and its database (focusing on SEA): http://www.commissiemer.nl/nceia/database/index.htm

International Association for Impact Assessment (IAIA) (based in the US): http://www.iaia.org/index.htm

The homepage of the Canadian Environmental Assessment Agency: http://www.ceaa-acee.gc.ca/index_e.htm

The homepage of the (NEPA) Task Force established by the Council on Environmental Quality (CEQ): http://ceq.eh.doe.gov/ntf/

The Australian EIA Network: http://www.deh.gov.au/epbc/assessmentsapprovals/

Australian HIA activity: http://chetre.med.unsw.edu.au/hia/

The Health Impact Assessment Gateway provides access to HIA related information resources. Sources of evidence and networks to assist people participating in the HIA approach. http://www.hiagateway.org.uk/

Human Health Impact Assessment and CEAA. Environmental Health Assessment Services provides direction to Health Canada on all activities carried out under the Canadian Environmental Assessment Act (CEAA). http://www.hc-sc.gc.ca/hecs-sesc/ehas/index.htm

The International Health Impact Assessment Consortium (IMPACT) is a multi-agency partnership formed to help further the research, study and practice of Health Impact Assessment. http://www.ihia.org.uk/

STAKES (Finnish national research and development centre for welfare and health). Human Impact Assessment. http://www.stakes.fi/sva/huia/

USA, State of Minnesota: http://www.health.state.mn.us/divs/chs/mhip/#6

Vertigo (France) http://www.vertigo.uqam.ca/vol4no1/j_ai_lu/j_ai_lu.html

The Welsh Assembly Government is committed to developing the use of Health Impact Assessment. http://www.cmo.wales.gov.uk/content/work/health-impact/index-e.htm

World Health Organization (WHO) WHO/Regional Offices/Europe. Health impact assessment. http://www.who.int/hia/network/regional/en/index2.html

World Health Organization (WHO): Health impact assessment. http://www.who.int/hia/en/

6.6 Country abbreviations

Austria (AT)
Belgium (BE)
Canada (CA)
Cyprus (CY)
Czech Republic (CZ)
Denmark (DK)
Estonia (EE)
France (FR)
Germany (DE)
Greece (GR)
Hungary (HU)
Ireland (IE)
Italy (IT)
Latvia (LV)
Lithuania (LT)
Luxembourg (LU)
Malta (MT)
Netherlands (NL)
Poland (PL)
Portugal (PT)
Slovakia (SK)
Slovenia (SI)
Spain (ES)
Sweden (SE)
United Kingdom (UK)
United States of America (US)