

Costs and benefits of the EIA Directive

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Preface

This report was written for the European Commission, DG Environment, within the framework of specific agreement no. 07010401/2006/447175/FRA/G1 under Framework Contract no. ENV.G.1/FRA/2004/0081. Contributions for the review of existing studies were provided by Cécile des Abbayes (BIO), Tjasa Bole (IVM), Alena Dodoková (IEP), Peter Hjerp (IEEP) and Anneke von Raggamby (Ecologic).

Executive summary

The EU's Environmental Impact Assessment (EIA) Directive has been in operation for over 20 years. The present study presents the results of a review of existing studies which can contribute to identifying the costs and benefits associated with the implementation of the Directive.

The costs of performing an EIA (usually borne by the developer) are mostly less than 1% of overall (investment) costs of the project, but vary widely. Their relative importance tends to decrease with project size. Other project characteristics influence the height of EIA costs as well.

EIA costs incurred by public administrations mainly consist of man-hours. These are often not specified separately. Where estimates do exist, they show a wide range (from a few hours to several months per EIA).

Whereas in some countries no significant costs in terms of delays due to EIA are reported, in other cases it is argued that such delays are a major cost item. However, attempts to avoid delays may sometimes lead to other costs or reduce the benefits of EIA.

EIA benefits occur in many guises: improved project design, improved decision making, better information disclosure, more public involvement, better co-operation, smoother processes etc.. High information quality in EIA is a prerequisite for these benefits to materialize. Radical changes in projects due to EIA seem to be rare, but this can in part be explained by the higher environmental awareness that EIA creates among project developers, making them incorporate environmental concerns in project design from the outset.

Even though most benefits of EIA can not be expressed in monetary terms, there is widespread agreement that the benefits outweigh the costs. Nevertheless, there may still be opportunities for further increases in benefits and decreases in costs. The following areas seem to be worth a closer exploration:

- Harmonisation of criteria and procedures for screening and scoping;
- Applying EIA in an earlier stage of decision making, when the range of alternatives (e.g. for siting and technology options) is still wide;
- The use of models and standard elements, where appropriate, possibly supplemented by location specific tailored research;
- Streamlining and integration of EIA with other types of assessment and procedures (e.g. cost-benefit analyses; project assessments under the Habitats Directive);
- A requirement for competent authorities to specifically address the results of the EIA in their decision, and to mention explicitly the considerations underlying this decision with respect to these outcomes.

1. Introduction

The Environmental Impact Assessment (EIA) Directive (85/337/EEC, as amended by Directives 97/11/EC and 2003/35/EC) entered into force in 1985. Over the more than 20 years of its existence, numerous projects in the EU Member States have been subject to the EIA procedure.

EIA entails costs as well as benefits, both private and public. The costs include, among others, the direct costs involved in preparing the EIA, possible delays in the project's progress, and the costs for the competent authorities, e.g. to process the information, check its quality, and use it in decision making. There may also be costs due to e.g. legal procedures that would not have occurred if there had been no EIA procedure.

The primary benefits are the improvements in environmental quality (with ensuing avoided damage to health, nature etc.) that may occur if the EIA has led to a more 'environmentally friendly' decision than would have been taken in its absence. Other benefits may include, for instance, a smooth and streamlined permitting process, with less resistance due to better stakeholder involvement and information disclosure (avoiding legal procedures), and improvements in project design due to the emergence (in an early stage) of alternatives that would not have been considered otherwise. Table 1.1 summarises the main cost and benefit categories of EIA.

Table 1.1. Potential costs and benefits of EIA

Costs	Benefits
<i>For the developer:</i> Performing the EIA Possible delays	<i>For the developer:</i> Smoother process; less conflicts (Early) awareness of environmental impacts and possible project alternatives
<i>For the competent authorities:</i> Managing the EIA procedure	<i>For society at large:</i> More stakeholder involvement and information disclosure; less conflicts
Processing, checking and using the information from the EIA	Well-founded decision making
	Better environmental quality

To what extent the benefits of the EIA Directive outweigh its costs is largely unknown. Ten years ago, a report by the European Commission (1996a) presented some evidence, but since that time there has been no systematic evaluation of the costs and benefits of the EU's EIA legislation and its implementation in the Member States.

The present report presents the results of a review of existing studies¹ which can contribute to identifying the costs and benefits associated with the implementation of the

¹ Appendix I contains summaries of all studies reviewed. Some supplementary information gathering has been done in France, Spain and the Czech Republic. The results

EIA Directive². The review focuses on studies from EU Member States and the other three EEA countries, but some potentially relevant studies from other countries are included as well. A synopsis of these studies is given in chapter 2, in general terms as well as by types of costs and benefits. Based on this review, findings which may be of EU-wide relevance are highlighted (chapter 3). In chapter 4, areas where studies carried out so far have not produced conclusive results are identified, and recommendations are given for areas that should be investigated further.

are presented in Appendix II, which also contains two more extensive summaries on a Norwegian and a Czech study.

² The scope is limited to EIA; publications on Strategic Environmental Assessment (SEA, the subject of EU Directive 2001/42) are therefore not considered.

2. Findings from existing studies

2.1 Method and approach followed

For practical reasons (available time, staff and language capabilities) the review of existing studies has been confined to publications in English, German, French, Italian, Spanish, Dutch, Swedish, Danish, Norwegian, Finnish, Czech, Slovak and Polish.

In order to ensure the completest possible coverage, several different approaches have been followed to identify potentially relevant studies. In addition to ‘standard’ literature and internet searches (using several combinations of possibly relevant keywords, and using different search engines, including scientific ones), recent volumes of EIA related journals have also been browsed. Furthermore, publications by EIA institutions were screened for cost and benefit elements. In France, Spain and the Czech Republic, EIA experts have been contacted directly, to compensate for the apparent lack of any relevant published studies in these countries. In Germany, an interview was held with researchers who are currently evaluating the German EIA system because they do not have any publishable results yet.

A number of publications that were reviewed appeared in the end not to contain any relevant information on costs or benefits of EIA. The present chapter does not refer to these publications, but they are nevertheless included in Appendix I, as they may still contain interesting information on other EIA related issues. Appendix I also mentions some potentially relevant publications that could not be obtained and are therefore not summarized.

2.2 Costs of EIA

2.2.1 Overall costs

Several studies contain general statements on the costs of EIA. For example, Lee *et al.* (1994) reported that in the majority of the 50 (UK) cases in their sample, any cost increases associated with the EA process had been minor. In interviews, the initiators of projects in Sweden stated that the costs of an EIA were reasonable in relation to their projects (Naturvårdsverket, 2001).

Based on a large survey of senior mining company executives in Australia and Canada, Annandale and Talin (2003) found that companies see environmental approvals regulation (mainly EIA) as an encouragement to development rather than as an impediment. According to the authors, this refutes the idea that EIA is ‘burdensome’ to private firms, at least in relation to the mining sector.

2.2.2 Costs of performing an EIA

In Table 2.1, statements on the estimated costs of carrying out an EIA that could be found in the literature are summarized. In most cases, these costs are expressed as a percentage of the total (investment) costs of the project. The range of estimates is quite

broad, even though the ‘rule of thumb’ that these costs tend to be in most cases below 1% seems to be broadly confirmed.

Table 2.1. Statements on the costs of performing an EIA according to various sources

Source	Cost estimate (range)	Geographical coverage
<i>As a percentage of total (investment) costs of the project</i>		
Garner and O’Riordan (1982)	Rarely > 0.6%	UK
Coles <i>et al.</i> (1992)	0.000025 - 5 %	UK
DoE (1996)	≥ GBP 5,000	UK (20 cases)
European Commission (1996a)	In a majority of cases < 0.5%; exceptionally > 1%	EU
Zetter (1997)	0.1 to 0.5%	UK
Athanassopoulou (2001)	Around 1%	Greece
Wood (2003)	Usually < 1%	Not specified
Haraldsson and Guðmundsdóttir (2003)	0.5 – 3%	Iceland (road projects)
Miljøverndepartementet (2003)	Normally < 0.1 – 0.5%	Norway
Kessel <i>et al.</i> (2003)	Usually < 1%	Netherlands
Njål <i>et al.</i> (2005)	0.1 – 2.2%	Norway (11 cases)
BIO (2006a)	2.5% (with large variations)	Spain
<i>In absolute amounts</i>		
Sadler and Verheem (1997)	Mostly < USD 100,000	Not specified
DETR (1997)	Median: GBP 35,000	UK (new regulations)
Obroučka <i>et al.</i> (2005)	EUR 6,600 – EUR 21,700	Czech Rep. (industrial projects in Category I)
BIO (2006b)	EUR 5,000 to > 100,000	France
<i>In time spent</i>		
DoE (1996)	22 person-days to 3-4 person-months	UK (20 cases)

As a percentage of total cost, the EIA component becomes smaller the larger the project (EC, 1996a; Wood, 2003). Accordingly, the Swiss EIA evaluation (Sager and Schenkel, 2003) found that the cost issue was less of an issue with big projects than with smaller ones.

According to BIO (2006b) the size of the project, is an important factor determining the costs, but other factors play a role as well. Generally speaking, EIAs will be relatively expensive for:

- ‘linear’ projects (like routes and electricity lines);
- nuclear or industrial activities;
- projects where health impact assessments are required;
- projects related to the marine environment;
- big companies or administrations.

Obroučka *et al.* (2005) studied the costs of EIA in the Czech Republic, and found that these costs are dependent on the type of project, the location and the competent authority. The highest costs are found for industrial production projects in Category I.

A study of eight EIAs in the extractive industry (Pritchard *et al.*, 1995) found that developers felt that 'the preparation of the ES had cost them too much time and money', but did not specify any amounts.

Even though the overall evidence suggests that in general the costs of preparing an EIS are limited, further cost reductions might be achieved. Kessel *et al.* (2003) suggest to use models and standard elements (as is done in Canada and Australia), possibly supplemented by location specific tailored research. Ruijgrok and Bel (2004) argue that costs can be saved in cases where both EIA and cost benefit assessment (CBA) procedures have to be performed, by using the same information sources as much as possible. Führ *et al.* (2007) see opportunities for cost reductions in the integration of EIA with other types of assessments (e.g. for the Habitats Directive) and in setting up more clearly defined criteria for screening.

2.2.3 Costs to public administrations

There is little specific information on the costs of EIA for the authorities. This can be explained by the fact that EIA always takes place in parallel with other administrative procedures for the same project, e.g. licensing. Authorities will often not be able to disentangle the costs that are due to EIA from the costs of the other procedures.

According to DoE (1996), many planning officers in the UK felt that dealing with the EIS and the planning application were one and the same and "just part of the job". Estimates for reviewing the EIS and associated consultations ranged from five hours to 6-8 months of staff time. In the 20 case studies, the time spent by consultees on EIA ranged from four hours to one-and-a-half days for statutory consultees, and from one hour to two weeks for non-statutory consultees.

Leu *et al.* (1995) presented figures on the costs of hiring consultants to help local authorities in the UK in assessing EISs (which only 30.5% of the surveyed authorities actually did). In more than 50% of the cases, the costs were less than GBP 5,000. In 5% of the cases they exceeded GBP 20,000.

According to the BIO (2006b) report on France, an EIA will add about half a day of work to an authorisation procedure; in specific cases this may be more.

Athanassopoulou (2001) notes that in the case of Greece there is no official information on the costs of environmental impact assessments. Costs are incurred in the public sector primarily in the form of the time of administrative personnel.

A.A.A. (2006) identifies some areas in which there may be costs inefficiencies in EIA practice in Italy. These include difficulties in assessing national and regional competencies, administrative inefficiencies, limited public participation, heavy administrative burden due to lack of harmonisation with other instruments (SEA, IPPC, Seveso,...), etc..

Several studies find that there may be 'learning' and 'scale' effects in the authorities' activities concerning EIA. For example, Arts (1998) mentions a Dutch case where ex-

penses had been incurred because of the limited experience in carrying out EIA evaluation.

Arts (1998) pays some attention to the costs of ex-post EIA evaluation (an element of EIA that is required in the Netherlands, but not in EU EIA legislation). It is stated that the authorities can avoid many of such (potential) costs by linking up with other evaluative activities, e.g. activities stemming from environmental permits and their enforcement or from environmental management systems. It appears that most of the EIA evaluation costs are man-hour costs.

2.2.4 Costs of delays and procedural requirements

Just like the costs of performing an EIA, estimates of the costs in terms of the time that is required for an EIA and the possible delays that the procedure may cause differ widely.

Coles *et al.* (1992) estimated for the UK the average duration of the entire EIA process at 62 weeks, of which 25 weeks for the EIS preparation. According to the EC (1996a) report, EIAs are usually completed in under 2 years, but there is considerable variation from project to project. Sadler and Verheem (1997) stated that internationally, most EIA reports are processed in less than 18 months. Kørnøv *et al.* (2003) found that in Denmark an EIA takes on average approximately 22 months. Industry cases can be handled in 13 months, while infrastructure cases can take up to 2½ years.

Some sources argue that EIA does not cause any major project delays. For instance, according to the study by Lee and Brown (1992) on the UK, EIA seemed to have a neutral influence on the length of the decision making process. About half of the officers they interviewed felt that EIA had not influenced how long it took to reach a decision; the rest were about evenly split between those who felt that the EIA had speeded up or slowed down the process. Likewise, the DoE (1996) report found that in the UK EIA does not necessarily slow things down: “The more organised approach makes it more efficient and in some cases it allows issues to be picked up earlier. The EIS can thus speed up the system”. Zetter (1997) also concludes (with respect to the UK) that “generally [...] longer timescales are unlikely to be significant”.

In Norway, Miljøverndepartementet (2003) found no documented project delay for projects that are assessed according to the EIA provisions. For Austria, Klaffl *et al.* (2006) found insignificant costs of EIA in Austria in terms of its influence on the project and the procedure. Kessel *et al.* (2003) state that in the Netherlands the EIA procedure usually is not the main cause of lengthy procedures, even though better streamlining and better ‘embedding’ the EIA procedure in other procedures may contribute to reducing their length.³

Other studies, however, do find delays arising from EIA procedures. Wood (1999, 2003) notes that the main cost of EIA is the delay which EIA may sometimes cause. In France, when an EIA has to be performed, the procedure to obtain the authorisation to launch the corresponding project is always longer (BIO, 2006b). For example, public participation

³ Führ *et al.* (2007) also suggest that cost savings are possible by integrating EIA with other procedures.

can add from 1 to 6 additional months to the procedure.⁴ The risk of procedural delays in the case of transboundary projects was also noted.

According to Naturvårdsverket (2001) in Sweden large indirect costs are involved in the time lags that the EIA procedure sometimes creates, mainly due to a lack of resources at the authorities. It is recommended to investigate the differences in costs and time involved in different types of projects and between the different authorities in different parts of the country.

Weston (1995) reported that some UK consultants felt that EIA slows down the decision-making process, imposes additional costs on developers and is a means through which local planning authorities can make unreasonable demands on developers to provide detailed information on issues “which are not strictly relevant to the planning decision”.

In their Dutch EIA evaluation, Kessel *et al.* (2003) state that where EIA is a major cause of delay, this is usually related to projects for which an EIA is discretionary (Annex II projects) and the decision that an EIA has to be performed is taken in a late stage.

According to the EC (1996a) report, delays can occur for many reasons unrelated to the EIA process itself.

Even if EIA may cause delays in certain cases, this does not mean that attempts to reduce those delays will always result in a reduction of overall net costs (or larger net benefits). For example, Pieters (2004) points to the fact that time savings by reducing the opportunities for public participation (which at present in the Netherlands are more extensive than required by the EU Directive) may be offset by the additional court procedures that will follow. Androulidakis and Karakassis (2006) notice that in Greece authorities in charge are principally interested in conformity with formal requirements rather than in reliable predictions and in overall quality of the EIA procedure. One of the reasons for such an approach is the time pressure due to running expenses of the project. In other words, they attempt to reduce the costs of delay, but this may imply a loss of benefits due to low-quality EIAs. A similar experience is reported from Hungary, where Radnai and Mondok (2000) noted that tight administrative deadlines for the authorities led to a lack of in-depth analysis of issues and often resulted in too general or superficial terms of reference for the detailed assessment.

2.3 Benefits of EIA

2.3.1 Environmental benefits

In our survey we have not encountered any studies trying to estimate the environmental benefits of EIA in terms of the (quantified or even monetized) environmental improvement (or prevention of environmental damage) that can be attributed to the EIA procedure. Nevertheless, there is widespread consensus that EIA can contribute to significant environmental benefits, even if these do not carry an explicit price tag.

A substantial amount of literature deals with the *quality* of EIA. Obviously, a good EIA procedure and a good EIS can be seen as a prerequisite for any environmental benefits to

⁴ The *financial* costs of public participation are estimated at about € 3,200 per EIA.

emerge, as confirmed by the French experts interviewed by BIO (2006b). Lee and Dancy (1993) assessed and compared the quality of EISs produced in Ireland and the UK. In both countries, high percentages of EISs were unsatisfactory in the late 1980s but, subsequently, considerable improvements had been achieved. More recent examples of studies dealing with EIA quality include Barker and Wood (1999), Bechmann and Steitz (2004), Canelas *et al.* (2005), EC (1996b), Glasson (1999), Johansson and Hedlund (2006), Pölönen (2006). Perhaps not surprisingly, the picture emerging from these different studies is rather mixed, but there still seems to be a tendency for EIA quality to improve over time. This tendency is also confirmed by the specific study on France (BIO, 2006b). Nevertheless, Ross *et al.* (2006) state that the quality of EISs still leaves much to be desired. In some countries, low-quality EIAs appear to be related particularly to time pressure and tight deadlines (Androulidakis and Karakassis, 2006; Radnai and Mondok, 2000). To assess the quality of EIA also is the starting point for the German evaluation (Führ *et al.*, 2007). However, the researchers argued that it is impossible to prove the correlation of environmental benefits to EIA due to methodological problems. First there are too many factors influencing the environmental situation and second EIA requirements have proved to be already considered early on in project planning (see below).

Many publications refer to the *usefulness of EIA for environmental decision making* (e.g. Canelas, 1989; Cashmore *et al.*, 2004; DoE, 1996; De Valk, 1997; Feldt, 2003; Hokkanen and Kojo, 2003; Lee *et al.*, 1994; Leknes, 2000; Miljøverndepartementet, 2003; Piper, 2000; Wood and Jones, 1997). Though the details may differ, all of them seem to confirm the conclusion from the case studies in the EC (1996a) report, that the EIA process results in benefits in terms of a better information base and framework for analysis for decision making. A dissenting view is presented by Pritchard *et al.* (1995), who found that developers in the extractive industry felt that the large amounts of work involved in EIA often yielded “few tangible benefits in terms of the actual planning decision reached”. Tennoi *et al.* (2006) argue that more emphasis should be given to improving the communication of uncertainty in EIA predictions and to making the prediction processes more transparent in order to improve EIA as a decision-aiding tool.

A key area of benefits relates of course to the extent to which EIA affects the *design of projects* and leads to *modifications*, mitigation of negative environmental impacts or the choice of more environmentally benign options. Indeed, Wood (2003) states that these are the main direct benefits of EIA. The general picture emerging from the literature confirms that this kind of benefits does occur, although they are seldom specified and never quantified (see e.g. Cashmore *et al.*, 2003, 2004; Hokkanen and Kojo, 2003; Hokkanen, 2004; Kessel *et al.*, 2003; Lee, 1995; Lee *et al.*, 1994; Miljøverndepartementet, 2003; Sager and Schenkel, 2003; Wende, 2001, 2002). In a majority of the cases reviewed in the EC (1996a) study, benefits were identified in terms of e.g. higher standards of mitigation and project re-siting or re-design to spare environmentally sensitive areas. Strong evidence for project modifications as a result of EIA was also found in the Danish EIA evaluation (Christensen *et al.*, 2003a,b; 2005), even though most of the changes were minor. In a similar vein, Kobus and Lee (1993) found that about half of the projects in their sample were modified by the decision to prepare an EIS and hold consultations, but most changes were minor. Piper (2000) shows that taking into account the cumulative effects of different projects may result in some changes in the original project proposals

and additional mitigation measures, which would not have occurred if the projects had been assessed separately. Wende (2001, 2002) determined that EIAs tend to cause spatial modifications to a project, but do not significantly impact decisions surrounding emissions and water restrictions.

The interview in Germany (Führ *et al.*, 2007) revealed some methodological complications regarding the measurement of EIA benefits in terms of project modifications. At least in Germany the sole existence of EIA leads to an anticipation of its requirements early on in project planning so that project modifications due to the EIA are very rare. Therefore, using the number or extent of project modifications as an indicator to assess environmental benefits is clearly limited.

In the study by Weston (1995), about three quarters of the consultants surveyed felt that EIA had brought about at least some improvements in environmental protection, primarily through the incorporation of mitigation measures early in project design and the higher regard given to environmental issues. However, other consultants felt that the system is “often a sham with EISs full of platitudes”. Woloszyn (2000) considered the Polish EIA system to be rather ineffective, as it focused on its role in environmental analysis and had little opportunity to influence planning or project design and management. However, improvements had been introduced by new legislation in 1997. According to Führ *et al.* (2007), modifications of projects in response to the EIA are rather rare in Germany. EIA requirements are being anticipated and incorporated in the project planning from the beginning

In any case, it seems unlikely that EIA leads to radical changes in the proposed project, that would lead to fundamentally different (lower) environmental impacts. For example, Lund and Hvelplund (1997) argue that EIA does not support technological change, because it is implemented on a restricted, regional basis. The (Danish) law does not require alternatives to be assessed that extend geographically beyond the boundaries of a regional authority. Thus, there is no certainty of serious analysis of cleaner technology alternatives to (in this case) large coal-fired power stations. Likewise, the BIO (2006b) report on France states that EIA’s benefits could improve if performed earlier in the process. Presently, its role is more to optimise the project from an environmental point of view thanks to mitigation measures, rather than to help choose the best solution from the beginning. Furthermore, according to experts interviewed by BIO (2006b), the benefits of EIA could increase if the follow-up on mitigation measures was more systematic. Some stakeholders said that this is a weakness of the Directive, which asks project developers to produce mitigation measures, whose implementation is then not compulsory.

2.3.2 Other benefits

Many studies mention benefits of EIA in terms of *public involvement and participation* in decision making procedures relating to projects with potentially significant environmental impacts (see e.g. BIO, 2006b; Chaytor, 1995; Huhtinen, 2006; Miljøverndepartementet, 2003; Palerm, 1999; Stookes, 2003). Evidence of such benefits is also reported from countries which used to have a tradition of little transparency (such as Bulgaria), so that EIA may be said to have contributed to the development of ‘civil society’ (Almer and Koontz, 2004). Hokkanen (2004), however, found that the civil society participation through the institutionalised EIA procedure is not without problems. In his (Finnish)

case study, only a few active groups participated in the EIA process and there were signs of “elitist political networks”.

According to Wood (2003), indirect EIA benefits widely observed include *increased awareness and knowledge*.

Radnai and Mondok (2000) found that in several cases in Hungary the EIA procedure has promoted *better co-operation* among the concerned authorities and the proponent.

EIA may also contribute to *higher acceptance* of the proposed project and *less conflicts*, as noticed in the Austrian EIA evaluation (Klaffl *et al.*, 2006) and in the French study (BIO, 2006b). On the other hand, Haunhorst *et al.* (2001) report on a German case in which EIA tended to aggravate the existing controversy around the project and thus could hardly be said to be beneficial in this respect.

Time savings (in fact the mirror image of the potential delays mentioned under ‘costs’) as a result of EIA are noticed in a number of studies (e.g. DoE, 1996; Garner and O’Riordan, 1982). Such benefits may for instance be due to a better streamlining of the process, more efficient information flows, and standardisation (stakeholders know what an EIA procedure entails; routines can be developed, etc.).

Benefits are also observed in terms of *improvements in the environmental profile of the project initiator*. For example, the EC (1996a) report recorded significant benefits related to the enhancement of the developer’s environmental credibility.

Benefits may occur if the EIA leads to the *prevention of costs* that might have occurred in its absence, such as those of compensatory measures. The investigations made for the EIA may also reveal information that lead to cost savings in the project design (see BIO, 2006b).

Nielsen *et al.* (2003) investigated the benefits (and costs) of the *screening* procedure for projects listed in Annex II of the EIA Directive. Even though eventually only 3% of these projects actually is subjected to an EIA, the screening instrument is considered efficient in terms of securing an environmental optimisation of the projects. Almost half of the investigated projects had been changed and the changes had primarily been preventive measures. Efficiency was judged by not only the capacity of screening to change the project, however, but also by the fact that the authorities use very few resources.

The specific benefits of *scoping* have been addressed by the Environment Agency (2002), Haldorsson and Sigurdardottir (2006), Kessel *et al.* (2003) and Wood (2006). Scoping is generally seen as a useful way of reducing the costs of an EIA procedure. The experience in Hungary (Radnai and Mondok, 2000) shows that ignoring scoping can lead to EISs containing a lot of unnecessary or unimportant information. In BIO (2006b) it is noticed that in France some project developers request extensive impact assessments on some topics (e.g. air pollution) which would not have necessarily been the case if scoping had been done correctly. The reason is that project developers use EIAs more and more as juridical insurance, more than decision-making tools.

Dipper *et al.* (1998) highlighted several benefits to EIA performance that could arise if the results of *post-auditing* (assessing the accuracy of predictions made in the EIA) were effectively used. In practice, however, they found that post-auditing activities were not widespread. This is confirmed by the findings of Arts (1998).

2.4 Comparing benefits and costs

A number of studies and other documents contain statements on the overall balance between benefits and costs of EIA, often without specifying any details on the components of the items on both sides of the scales.

A survey in the UK revealed that both planning officers and developers/consultants, when asked whether EIA was a net benefit or cost, overwhelmingly responded that it had been a benefit (Jones, 1995). Only a small percentage of both respondents felt that EIA had been a drawback. Lee (1995) cites the EU's 1993 EIA evaluation, saying that "the benefit had been achieved at relatively low EIA process and mitigation costs and without significantly affecting the overall timescale of implementing projects." Sadler (1996) found that according to a majority of international EIA practitioners, the benefits of EIA tend to outweigh the costs of application.

Ten Heuvelhof and Nauta (1997) investigated whether EIAs in the Netherlands had a 'net beneficial impact', i.e. if the efforts, costs and time involved were compensated for by the impact achieved. According to respondents (including initiators, authorities and independent experts) there was a net beneficial impact in 69% of the cases. In Bellinger *et al.* (eds., 2000), discussing EIA systems in central and eastern European and former Soviet Union countries, it is stated that "the general consensus is that, whilst the benefits of [EIA] developments have been greater than the costs of their implementation, there is still considerable scope for further improvement."

Wood (1999) compared eight EIA systems (USA, California, UK, The Netherlands, Canada, Australia, Western Australia and New Zealand). Despite the differences in each of these systems, there appears to be virtual unanimity of view that the benefits of all eight EIA systems outweigh their costs. This is confirmed in a later publication by the same author (Wood, 2003), in which also experience from South Africa was included.

In six of the seven EIA projects addressed in Njål *et al.* (2005), the benefits were deemed to outweigh the costs (based on interviews with and questionnaires to different actors). Moreno (2006) considers EIA to have led to "more effective and efficient environmental protection throughout the European Union".

More implicitly, the issue of net benefits is included in some other studies as well. For example, Pölönen (2006) concludes that in its current state, EIA legislation in the EU does not guarantee that the assessment results filter into decision-making. This implies that there is uncertainty on the net benefits: you can be sure that there will be costs if an EIA is done, but you are not sure that there will be any benefits in terms of better decision making.

Some European countries have performed (or are currently performing) comprehensive evaluations of their national EIA systems, in which costs as well as benefits are usually addressed (e.g. Austria: Klaffl *et al.*, 2006; Denmark: Christensen *et al.*, 2003a; Germany: Führ *et al.*, 2007; the Netherlands: Kessel *et al.*, 2003; Switzerland: Sager and Schenkel, 2003). But even such evaluations tend to draw conclusions in rather general terms and do not confront costs with benefits directly in money terms.

3. Conclusions with possible EU relevance

3.1 Costs

3.1.1 Introduction

After more than 20 years of experience with EIA in the EU, there seems to be a broad consensus that the costs of EIA are generally reasonable and not disproportionate. In this chapter we will try to summarize the main findings from the literature and draw some general conclusions.

3.1.2 Cost categories

The main components of EIA costs can be categorized under three headings:

1. The costs of performing the assessment and preparing the EIS. Estimates of these costs suggest that they may vary considerably, depending (among others) on the type of project and the procedure. Most sources arrive at figures below 1% of total project (or investment) costs, but the range is very broad. The lowest percentages are recorded for the largest projects. The absolute amounts range between a few thousand and more than 100,000 euros.
2. The costs that have to be made for EIA within the public authorities (mainly man-hours). Quantitative information on these costs is scarce, as it is difficult to isolate the costs of EIA from the costs that are related to other tasks, which would be incurred anyway. The differences between countries and authorities seem to be considerable. There are some indications that these costs may decrease as the authorities' experience with EIA grows.
3. The costs of possible delays as a result of EIA. Here again the general impression is that these costs are on average not very big, but substantial variation exists and it is difficult to disentangle the delay caused by EIA from other causes. The exceptional cases where the EIA itself is the main cause of lengthy procedures related to projects for which an EIA is discretionary (Annex II projects) and the decision that an EIA has to be performed is taken in a late stage. Lack of resources at the authorities may be another cause. On the other hand, some sources suggest that EIA may even contribute to shorter procedures (e.g. due to less court procedures) and thus imply a benefit in this respect.

3.1.3 Distribution of costs

The costs of carrying out an EIA are generally borne by the project developer. The literature review did not reveal any cases in which these costs were covered by other sources. Costs incurred by the public administration are generally covered by the public budget. Costs of delays are primarily felt by the project initiators and developers themselves in the form of capital costs and revenues foregone.

3.1.4 Differences between Member States and with non-EU countries

It has been noted above that substantial differences exist between different countries in the costs of EIA. To a certain extent, these differences could be related to differences in the interpretation and implementation of the EIA Directive, which actually leaves a substantial amount of discretion to the Member States.

In countries with a federal or highly decentralized administrative structure, such as Spain (and possibly also Germany and Belgium) the regional authorities can impose additional requirements on top of the national EIA legislative framework. This leads to differences between the regions (including differences in costs), but it is not clear whether the overall costs of EIA in those countries differ significantly from those in Member States with a more centralized government.

Another important difference between Member States is the way in which they use their discretion with respect to Annex II activities. In France, for example, the national legislation defines precise criteria and thresholds determining whether or not a project should be subjected to EIA. Obviously, this means that there are no costs of screening in France. On the other hand, the benefits of screening (in terms of avoided costs for projects that do not really need an EIA) are also foregone.

In other countries, the competent (permit issuing) authorities have significant competence to determine whether or not a project should be subject to EIA. In the Netherlands, for example, the number of actual EIAs is relatively small, but the number of screened projects is high, and the screening may sometimes be quite substantial, even leading to an impact assessment that is comparable to a full EIA (Kessel *et al.*, 2003).

There are some indications that costs decrease as the experience with EIA grows. This is another factor that might explain some of the differences between Member States, especially between the 'old' 15 and the 'new' 12 ones, although this hypothesis cannot be substantiated by the available literature.

There is little evidence of significant differences between the costs of EIA in the EU and in other countries, even though EIA legislation and practice in these countries may be quite different. Generally speaking, the data on EIA costs for non-EU countries appear to be within the wide range of costs observed within the EU.

3.2 Benefits

Even though quantification and monetization are generally not feasible, EIA has a number of real benefits. The main types include:

1. Better information on the environmental impacts of a project. The value of these benefits depends strongly on the quality of the EIA. The general picture is that considerable improvements in EIA quality have been achieved over time, even though there may be room for further progress. Low-quality EIAs may sometimes be related particularly to time pressure and tight deadlines.
2. Better decision making. This type of benefit is of course closely related to the previous one. A majority of analysts agrees that EIA contributes to the quality of the decision making process.

3. Reduced negative environmental impacts, through redesign and modification of projects, mitigation of impacts or the choice of more environmentally benign options. Arguably, these are the core benefits of EIA, and the available evidence shows that they do actually occur, but the changes are rarely substantial or radical. To a certain extent, this can be explained by the fact that initiators of projects that are subject to EIA take the environmental impacts already into account in an early stage of project design. Such environmental awareness and pro-active approach among developers may have been stimulated by the existence of EIA. This would imply that the 'invisible' benefits of EIA might be much larger than the 'visible' ones.
4. Benefits in terms of public involvement and acceptance, participation, and conflict mitigation. The evidence on this kind of benefits is mixed. Moreover, these benefits can probably not only be ascribed to the EIA Directive. In recent years (following the Århus Convention), provisions for public participation have been introduced in a number of other Directives as well⁵, and greater involvement of citizens in environmental decision making can also to a large extent be an autonomous, national process.
5. Benefits of screening and scoping. Some studies address specifically the costs of particular elements of the EIA process, such as screening and scoping. As noted above, the costs of screening may be substantial, but they may still be offset by the cost savings that can be achieved by avoiding unnecessary EIAs. Clearly defined criteria for screening might be useful in this respect. Similarly, adequate scoping may reduce the effort (and costs) spent on providing irrelevant information.

3.3 Balance and trade-offs between costs and benefits

A number of studies reveal that pressure to save costs or time may result in low-quality EIAs, which implies lower (potential) benefits. Furthermore, low costs in terms of staff and resources devoted to EIA may result in high costs in terms of delays.

The majority of sources addressing the issue of the balance between costs and benefits of EIA points towards net benefits. But this conclusion is usually based on a qualitative assessment rather than on a formal analysis of costs and benefits.

⁵ For instance by Directive 2003/35/EC.

4. Gaps in knowledge and recommendations for further studies

4.1 Identifying and quantifying costs

There are large differences in costs between EIAs. The larger the project, the higher the costs in absolute terms, but relative costs (as a percentage of total project costs) tend to decrease with size. Costs are probably also strongly related to the nature of the project. For example, an EIA for a unique project will be (much) more expensive than for a 'routine' or standardized case. Obviously, the location of the proposed activity will also be an important factor. Empirical evidence to support these presumptions is largely lacking. A systematic (quantitative) analysis of the main factors determining the costs of an EIA would therefore be justified.

In addition to the costs per EIA, the total cost of the EIA system may be relevant information. Calculating these costs would require knowledge of the number of EIAs performed. As can be seen from Figure 4.1, the annual number of EIAs per Member State, taking into account the size of its population, varies widely: between 2 per million inhabitants in Austria and 389 in Sweden.

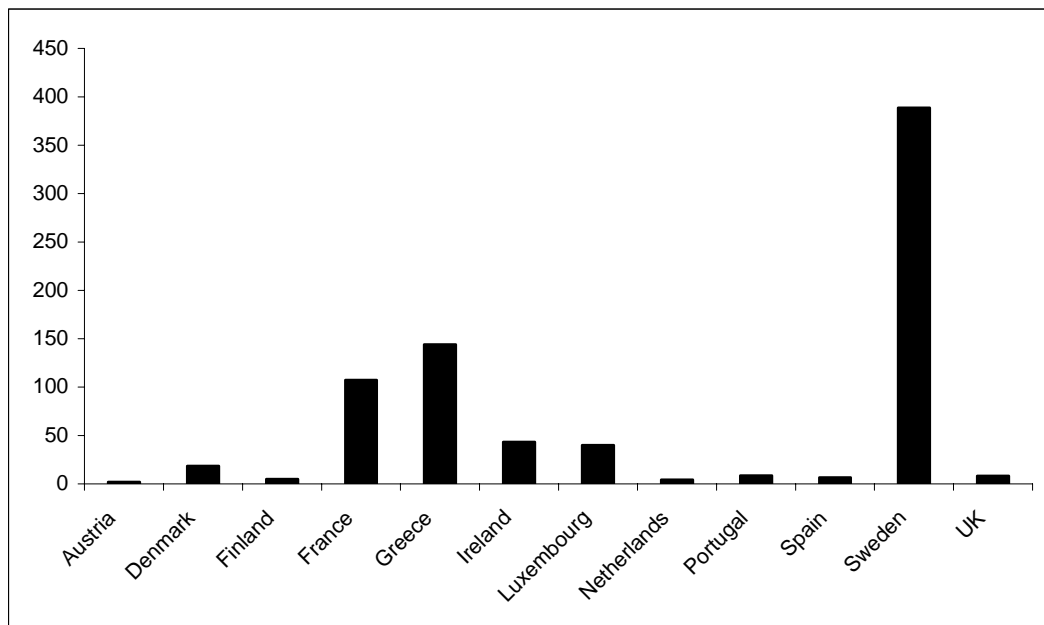


Figure 4.1: Number of EIAs per year for 12 Member States, per million inhabitants (calculated on the basis of post-1999 figures in EC (2002?), Table 9).

Even though the numbers reported by some Member States do not reflect the full picture, it is clear that there are substantial differences in the size of EIA efforts, and thus costs. Such differences even occur within one Member State, as the Swedish example shows (Naturvårdsverket, 2001). These differences may be explained by differences in interpretation of Annex I and II, by the wide variety in thresholds for Annex II projects and in

the discretion the authorities may have to determine whether or not an EIA is obligatory for such projects, as well as by differences in economic activity. Obviously, a reliable estimate of the costs of EIA in the EU can only be obtained if reliable information on the number and nature of EIAs is available for all Member States. At present, this information is lacking for several countries, especially those with a federal structure (including Germany; Führ *et al.*, 2007). Some kind of EU-wide system of standardized reporting on EIA practice, including the cost and time spent on it, would therefore be recommendable. Such a system should also provide a better insight into the main components of EIA costs, such as: preparing the EIS; administrative effort; and possible delays.

4.2 Identifying benefits

The available information on benefits of EIA is mainly of a qualitative nature. However, it seems doubtful whether closer investigations into EIA benefits would reveal more (reliable) quantitative information or even monetary values. Such analyses would depend on highly hypothetical and even speculative assumptions concerning the counterfactual, i.e. 'what would have happened if no EIA had been done', and its results would be methodologically questionable. Moreover, the valuation of environmental impacts is fraught with difficulties, especially if the impacts are site-specific, as is often the case in projects that are subject to EIA.

A more promising way of making the benefits of EIA (and its components) better 'visible' might be to compare countries with different EIA systems. Such a comparison could identify any systematic differences in decision making regarding similar kinds of projects. For example, in some countries (such as the Netherlands) the EIA legislation require to include a 'most environmentally benign' alternative in the assessment. The benefits of such a requirement could be revealed by checking whether the decision making in these countries tends to favour more environmentally benign alternatives than in countries that do not apply such an obligation. Likewise, the specific benefits of screening and scoping procedures might be highlighted by analysing the differences in approaches between Member States and the results in terms of cost savings and relevance of information.

4.3 Opportunities for improvements in the benefit/cost balance

The available literature suggests that most EIA practitioners are convinced that EIA brings about net benefits in general. Nevertheless, opportunities seem to exist for reducing the costs of EIA without significant losses in benefits, and for higher benefits at low additional cost. More in-depth analysis would be needed to get a clear picture of these potential efficiency gains. The following areas seem to be worth a closer exploration:

- Harmonisation of criteria and procedures for screening and scoping;
- Applying EIA in an earlier stage of decision making, when the range of alternatives (e.g. for siting and technology options) is still wide;
- The use of models and standard elements, where appropriate, possibly supplemented by location specific tailored research;
- Streamlining and integration of EIA with other types of assessment and procedures (e.g. cost-benefit analyses; project assessments under the Habitats Directive);

- A requirement for competent authorities to specifically address the results of the EIA in their decision, and to mention explicitly the considerations underlying this decision with respect to these outcomes.

Appendix I. Literature summaries

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
Almer, H.L., Koontz, T.M.	Public hearings for EIA in post-communist Bulgaria: do they work?	2004	<i>Environmental Impact Assessment Review</i> 24, pp. 473-493	The paper starts with a critique of public hearings as a form of citizens' participation with respect to legal, administrative and representation problems, which are then applied to three cases of public hearings in Bulgaria. On the other hand, the indirect effect of the public hearing aspect of the EIA process is shown to have contributed to an increased public demand for transparency in the administrative affairs of post-communist Bulgaria, which can be seen as a beneficial development in Bulgarian civil society.
Andreou, A.G., and C.E. Jones	Development of the IEA Process in Cyprus	2001	<i>Impact Assessment and Project Appraisal</i> 19 (3), p. 223-233.	This paper evaluates the Cyprus EIA provisions and makes a number of suggestions and recommendations as to how the Cyprus EIA process may be improved. No specific reference to costs or benefits.
Androulidakis, I., Karakassis. I.	Evaluation of the EIA system performance in Greece, using quality indicators	2006	<i>Environmental Impact Assessment Review</i> 26, pp.242-256	The paper reviews a sample of Greek EIA and assigns a degree of sufficiency of examination of a number of attributes examined in the EIAs. It concludes that the authorities in charge still have little experience in coping with the increasing bulk of project submissions and are principally interested in conformity with formal requirements rather than in reliable predictions and in overall quality of the EIA procedure. One of the reasons for such an approach is the time pressure due to running expenses of the project.
Annandale, D., and R. Taplin	Is environmental impact assessment regulation a 'burden' to private firms?	2003	<i>Environmental Impact Assessment Review</i> 23 (3), pp. 383-397	This article reports on a research project that focused on the impact that environmental approvals regulation (predominantly environmental impact assessment, EIA) has on proposed new development in the international mining sector. Based on a large and externally valid survey of senior mining company executives in Australia and Canada in the late 1990s, the research indicated that a significant majority of firms consider the environmental approvals process to be an important determinant of investment strategy. The somewhat surprising conclusion that companies see environmental approvals regulation as important, but as

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
				an encouragement to development rather than as an impediment, goes against much previous industry and academic comment and, at least in relation to the mining sector, refutes the idea that EIA is “burdensome”.
Arts, J.	EIA Follow-up. On the Role of Ex Post Evaluation in Environmental Impact Assessment	1998	PhD thesis, Geo Press, Groningen	Pays some attention to the costs of ex-post EIA evaluation (an element of EIA that is required in the Netherlands, but not in EU EIA legislation). It is stated that the authorities can avoid many of the potential costs related to EIA evaluation by linking up with other evaluative activities, e.g. activities stemming from environmental permits and their enforcement or from environmental management systems (p. 222-223). From the cases investigated it appears that most of the EIA evaluation costs are man-hour costs. In one case, extra expenses had been incurred because of the limited experience in carrying out EIA evaluation (start-up expenses) (p. 224).
Associazione Analisti Ambientali (A.A.A.)	Acts of the national conference ‘The quality of environmental impacts studies in the evolution of environmental governance’ (‘La qualità degli studi di impatto ambientale nell’evoluzione del governo dell’ambiente’)- Milan, 24-25 January 2002	2002	Quaderni di Valutazione Ambientale – Atti 4	The acts of the conference present a series of short papers dealing with different issues related to the quality of environmental impact studies undertaken in the context of EIA and Environmental Management Systems. None of them identifies specifically cost and benefits of EIA, but weaknesses and strengths are in some cases highlighted. Among these, the papers mention: the usefulness of EU guidelines but the need to integrate them with national/regional regulations, the heterogeneity of regional regulations, the lack of clear indications on monitoring - which need to be integrated with IPPC, Seveso and EMAS provisions, etc.

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Associazione Analisti Ambientali (A.A.A.)	Environmental Analysts Association's analysis and proposals on Environmental Assessment governance in Italy (Analisi e proposte dell'associazione analisti ambientali sul governo della valutazione ambientale in Italia)	2006	Available at http://www.analistiambientali.org/documenti/associazione/AAA_Posizionamento%20su%20riordino_VA_061112.doc	The document analyses the Italian provisions on EIA and SEA, highlights key problematic issues and suggests proposals for improvement, in light of the revision of a national framework regulation (law 152/06) dealing with, among others, environmental assessments. The document does not contain specific reference to costs and benefits. Nevertheless, by discussing the main weaknesses of EIA current practice, it identifies the areas in which there may be costs inefficiencies, such as: difficulties in assessing national and regional competencies, administrative inefficiencies due to inadequate length of procedure (too short for national EIA), limited public participation, heavy administrative burden due to lack of harmonisation with other instruments (SEA, IPPC, Seveso,...), etc
Athanasopoulou, E.	The Implementation of EIA in Greece	2001	In: H.Heinelt, T.Malek, R.Smith, and A.E.Toller, editors, <i>European Union Environment Policy and New Forms of Governance</i> . Ashgate, Aldershot, UK, pp. 295-307	"There is no official information on the costs of environmental impact assessments in Greece. Costs are incurred in the public sector primarily in the form of the time of administrative personnel. Deveopers have to pay for the costs of the EIA study. On average, these are estimated to cost around 1 percent of the total investment." (p. 300)
Atkinson, P., and A. Cooke	Developing a framework to assess costs and benefits of Health Impact Assessment	2005	<i>Environmental Impact Assessment Review</i> 25 (7-8), p. 791-798.	This paper presents some early thinking as to how the costs and benefits of HIA might be assessed. After considering previous work it uses a comprehensive HIA in Dulwich, SE London as a case study to highlight the possibilities and difficulties of collecting necessary data on costs and benefits. It then sets a context for developing a cost-benefit framework for analysis. The framework is viewed alongside the major types of economic evaluation. The paper concludes with a review of outstanding issues and considers how evidence on cost and benefit might make a difference in the application of HIA.

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Barker, A., and C. Wood	An evaluation of EIA system performance in eight EU countries	1999	<i>Environmental Impact Assessment Review</i> 19 (4), pp. 387–404	An evaluation of the quality of environmental impact assessment (EIA) reports, modifications to projects as a result of EIA, and the influence of changes to EIA procedures in the United Kingdom, Germany, Spain, Belgium, Denmark, Greece, Ireland, and Portugal is reported. The overall proportion of “satisfactory” EIA reports sampled increased from 50% to 71% between 1990–1991 and 1994–1996. Several modifications to projects occurred as a result of the EIA process, but there was no apparent trend over time relating to the number or significance of modifications. All the eight Member States had taken major or minor measures to modify EIA procedures and these either have already improved the quality of EIA practice or are expected to do so. A series of recommendations to improve the performance of the EIA process is presented.
Bechmann, A.; Steitz, M.	UVP-Entwicklung und Verwaltungsmodernisierung - Synergieeffekte nutzen	2004	<i>UVP-report</i> 18 (2+3), p.123-126.	Increasingly, an integration of concepts of knowledge and quality management takes place in both: the further development of EIA instruments and the modernisation of the administration. During the last three decades, a parallel can be drawn between the development of EIA and the one of the administration. Furthermore, as EIA was integrated into the existing administrative procedures, the quality of EIA practice highly depends on the administration. Against the background of the poor quality of EIA in practice, the modernisation of EIA and of the administration are closely linked. The authors argue for the usage and further development of EIA quality management systems with the help of which EIA could set an example to the administration. This would not only improve EIA practice but also the acceptance of EIA as a modern instrument. At the same time, EIA practice should be improved by making use of the willingness to modernise administrative structures.

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
Bellinger, E., N. Lee, C. George and A. Paduret (eds.)	Environmental assessment in countries in transition	2000	CEU Press, Budapest, Hungary	Contains a description of EA systems and developments in 19 central and eastern European and former Soviet Union countries. Some general findings and conclusions are also presented. States that “the general consensus is that, whilst the benefits of [EA] developments have been greater than the costs of their implementation, there is still considerable scope for further improvement.” (p. 8)
BIO	Cost and benefits of the implementation of the EIA directive in Spain	2006a	BIO Intelligence Service, December 2006 (unpublished document, prepared specifically for the present study; see Appendix II A)	On average, the cost of the individual EIA studies in Spain represent around 2.5% of the overall capital cost of the project, although this figure varies largely depending on the characteristics of the specific project. On top of the basic national legislation, regional authorities may impose additional requirements implying additional costs.
BIO	Cost and benefits of the implementation of the EIA directive in France	2006 b	BIO Intelligence Service, December 2006 (unpublished document, prepared specifically for the present study; see Appendix II B)	Contains the results of a number of discussions with French EIA stakeholders. The costs of carrying out an EIA in France are supported by the project developer. Expert estimates of these costs range from € 5,000 to more than € 100,000, depending on (a.o.) the size of the project. Low-cost EIAs may also have a low quality. Estimates of the costs (duration) of the different EIA steps are presented. Differences in EIA costs between types of projects are noted; e.g. EIAs for ‘line’ projects are more expensive than for ‘point’ projects. Furthermore, EIAs related to nuclear or industrial activities, or where health impact assessments will be required, will on average be very expensive. The costs of public participation were estimated at about € 3,200 per EIA. There was consensus that EIA brings benefits, although it may be difficult to attribute specific environmental benefits to EIA. The quality of EIAs has improved over its 30 years of existence in France. EIA’s benefits could improve if performed earlier in the process. The experts generally support the statement EIAs of good quality lead to better environmental protection. They also agree that EIAs improve communication between the various stakeholders and reduce social conflicts. EIA may furthermore lead to cost savings. The benefits of EIA could increase if the follow-up on mitigation measures was more systematic.

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Brandl, Klara and Merl, Astrid	10 years of EIA in Austria. A Good Reason for an EIA Evaluation	2005	Paper presented at the 25th IAIA Annual Conference, Boston, Massachusetts, 31 May-3 June, 2005. http://www.iaia.org/Non_Members/Confer-ence/IAIA05/Publications/05%20AV.pdf	After 10 years of EIA practice in Austria, an evaluation of the quality and efficiency of this meanwhile recognized instrument of sustainable environmental policy seems appropriate. The legal, technical and procedural adjustments of the past 10 years, as well as the advancements in decision quality, point to an “added value” for the environment, which was identified in the process of a discussion initiated in 2004. Those participating in the discussion were competent authorities, ombudsmen for the environment, planners, project applicants and interest groups under the moderation of the Federal Ministry of Agriculture, Forestry, Environment and Water Management. In this context, theories were developed which are now the starting point for our present study. The approach to the examination is a multi-disciplinary one, the object of investigation is examined from a legal, technical and political perspective. The theories mainly deal with the core questions of process quality / quality of procedure, technical quality and decision quality, namely who adds quality (project applicant, authority, public) and which stage of the procedure is especially important in terms of quality assurance. After a statistical analysis of all EIA procedures completed by the end of 2004 in Austria, selected cases will be evaluated by way of a qualitative document analysis of the EIA documents. To support this analysis, there will also be oral and written inquiries.
Braniš, M., and S. Christopoulos	Mandated monitoring of post-project impacts in the Czech EIA	2005	<i>Environmental Impact Assessment Review</i> 25 (3), pp. 227-238	The aim of the analysis was to find and characterize conditions prescribing to the developer to perform ex-ante and ex-post monitoring of potential impacts of projects submitted for approval.

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Canelas, L., <i>et al.</i>	Quality of Environmental Impact Statements in Portugal and Spain	2005	<i>Environmental Impact Assessment Review</i> 25 (3), pp. 217-226	Application of EIS Review Criteria to a set of 46 recent EIS (1998–2003), from Portugal and Spain, indicated that 18 years after publication of Directive 85/337, there is still a significant percentage of EIS — about 22% for Portugal and 30% for Spain — containing “weak provision of information with gaps and weaknesses which hinder the decision process but require only minor work to complete” and that about 4% in Spain contains “very poor provision of information with major gaps or weaknesses which would prevent the decision process proceeding and require major work to complete”. The percentage of EIS qualified as providing “full information with no gaps or weaknesses” is only 9% in Spain and 0% in Portugal. On the positive side it should be pointed out that the percentage of higher grades in Portugal and Spain seems to be growing in recent years.
Canelas, L.	First Environmental Impact assessment of a highway in Portugal: Repercussions of the European economic community directive	1989	<i>Environmental Impact Assessment Review</i> 9, pp. 391-397	This paper analyzes the first EIA process applied to a new highway in Portugal. The main steps in the process and methodology, prediction and evaluation of significant impacts, mitigation measures, and positive and negative aspects are analyzed and suggestions for future improvements are provided. The paper concludes that despite its clear shortcomings, the EIA process proved to be highly useful.

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Cashmore, M., D. Cobb, A. Bond, and R. Gwilliam	Enhancing the 'substantive' effectiveness of EIA	2003	In: T. Hilding-Rydevik and Á. Hlökk Theodórsdóttir (ed.), <i>Planning for Sustainable Development – the practice and potential of Environmental Assessment</i> . Proceedings from the 5 th Nordic Environmental Assessment Conference, Reykjavik, Iceland, 25-26 August 2003. Nordregio, Stockholm, 2004, pp. 157-181.. http://www.nordregio.se/Files/r0402.pdf	This research critically reviewed current knowledge on the substantive outcomes of EIA (i.e. its contribution to design and consent decisions, and sustainable development) to identify future research priorities. There is remarkably little empirical research on the substantive outcomes of EIA, but it indicates that EIA is generally perceived to exert a 'moderate' influence on both design and consent decisions. When assessed against specific, result orientated criteria (e.g. its contribution to minimising adverse impacts), however, the outcomes of EIA appear limited. It is suggested that greater research attention should be devoted to analysing decision processes and decision-makers' needs (broadly defined) in the development of a decision-orientated theory of EIA. The research agenda must also address more adequately the plurality of substantive outcomes of EIA: including, its contribution to institutional capacity development and to changing value systems.
Cashmore, M., Gwilliam, R., Morgan, R., Cobb, D., Bond, A.	The interminable issue of effectiveness: substantive purposes, outcomes and research challenges in the advancement of environmental impact assessment theory	2004	<i>Impact Assessment and Project Appraisal</i> 22 (4), pp295-310	An analysis of studies of the outcomes of environmental impact assessment (EIA) indicates that its role in consent and design decisions is limited, due primarily to passive integration with the decision processes it is intended to inform. How much EIA helps sustainable development is largely unknown, but it is hypothesised that it is more than is typically assumed, through a plethora of causes, including emancipation of stakeholders and incremental change in the bureaucracy, companies and scientific institutions. To enhance the effectiveness of EIA, research should focus more on theory about the nature and operation of diverse causal processes, even though the concepts, methods and analytical challenges would be substantial. The paper contains a good overview of the EIA's contribution to decision making in several countries.

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Chadwick, A.	Socio-economic impacts: are they still the poor relations in UK environmental statements?	2002	<i>Journal of Environmental Planning and Management</i> 45 (1), pp. 3–24.	The paper discusses the treatment of social and economic impacts within the UK EIA. Socio-economic effects have an uncertain status in the EIA, guidance on their assessment is limited and their treatment is often partial and of poor quality. The paper presents the results of a recent review of the socio-economic component of UK environmental statements, which provides information on the extent, scope, balance and quality of socio-economic impact treatment. The review reveals that, although most ES include some information on socio-economic issues, coverage tends to be narrowly focused on a small number of- primarily beneficial economic – impact types. Quantification of socio-economic impacts is also rarely attempted. The review findings are compared with those of similar studies undertaken in the mid-1990, and the paper concludes with some recommendations for EIA practitioners relating to the treatment of socio-economic impacts.
Chaytor, B.	The potential of EIA procedures to enhance public participation in trade decision-making	1995	<i>Environmental Impact Assessment Review</i> 15, pp. 507-515	Another paper promoting the EIA as a channel for public participation with its benefits for sustainable development; the focus is on the relationship between the EIA and international trade agreements.
Cherp, A.	EA legislation and practice in Central and Eastern Europe and the former USSR. A comparative analysis	2001	<i>Environmental Impact Assessment Review</i> 21 (4), pp. 335-361	The paper describes the main directions and the outcomes of the reform of EA legislation in practice in 27 former socialist countries in the 1990s. No specific reference to costs and benefits.

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
Christensen, P., K. Elsborg, L. Kørnøv, E.H. Nielsen, J. Schmidt and H. Stensen Christensen	The advantages of EIA—Evaluation of EIA in Denmark, main report (Udbyttet af VVM—Evaluering af VVM i Danmark, hovedrapport)	2003a	Ministry of the Environment, Denmark Landsplanafdelingen ISBN 87-601-9843-5 (Internet)	The study consisted of three main aims: · to assess to what extent the Danish EIA system has a holistic approach required by the EIA Directive; · to assess the environmental benefits of the EIA process; and · to assess how the EIA Directive have been implemented and the administrative procedure. We will focus on the sections assessing the environmental benefits. Of the 96 projects going through the screening phase, 45 per cent the screening process resulted in changes in the EIA procedure. For those 36 projects requiring an EIA the percentage was 90 per cent. The number of changes to the project, as a consequence of the EIA process, is used as evidence that the EIA process is beneficial to the environment. The EIAs assessed have not tried to quantify these benefits.
Christensen, P., L. Kørnøv, and E. Nielsen	The Outcome of EIA	2003 b	Department of Development and Planning, Aalborg University http://ec.europa.eu/environment/eia/pdf/eia_outcome.pdf	This report is designed, at the request of the European Commission, to present the key conclusions drawn from the evaluation of Danish EIA rules to a broader European audience. As part of the evaluation of EIA projects the authors looked in detail at the impact of EIA in terms both of direct and indirect effects, i.e. the actual EIA process and report and the deliberations between applicant and consultant prior to that stage. On the basis of the surveys carried out, it was possible to conclude that applicants' knowledge of EIA rules results in improvements to projects in environmental terms. On that basis, and given the scale of the changes made in various cases, the report states that EIA results in a lessening of projects' environmental impact and that this is mainly achieved by means of traditional mitigating measures. The environment benefits from a large number of improvements such as reduced noise, the protection of natural and man-made environments and reduced discharges of nutrients. Improvements for the environment are achieved both before projects are submitted to the authorities and during the EIA procedure itself.

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Christensen, P., L. Kørnøv, and E.H. Nielsen	EIA as regulation: does it work?	2005	<i>Journal of Environmental Planning and Management</i> 48 (3), pp. 393–412	Since its introduction into Danish planning in 1989, Environmental Impact Assessment (EIA) has been widely discussed. Although, in principle EIA offers a holistic and proactive methodology, it does not seem to lead to a more holistic and proactive regulation which covers more ground than traditional planning and environmental regulation. In an evaluation of Danish experiences, this study has looked more closely at the effects of EIA. Three types of effects on projects have been examined: changes occurring prior to the formal application; changes during the EIA process; and the mitigation measures that are demanded of projects. The general conclusion is that EIA does generate a significant number of changes to projects. In approximately half of the cases studied, modifications are made prior to the formal application. During the formal EIA process, modifications were made in more than 90% of the cases. However, most of these could be considered as minor. EIA is characterized by being based upon a broad concept of the environment. It was found that a progressive narrowing of the concept of environment takes place during the course of the EIA process.
Coles, T.F., K.G. Fuller, and M. Slater	Practical experience of environmental assessment in the UK	1992	<i>Proceedings of Advances in Environmental Assessment Conference</i> . London: IBC Technical Services	The authors found that an EIS generally costs between 0.000025 and 5 per cent of project costs. In terms of the delay caused to planning decisions, the entire EIA process took 62 weeks, the EIS preparation taking 25 weeks (cited in Glasson <i>et al.</i> , 2005, p. 233-234).
Department of Environment, Transport and the Regions (DETR)	Consultation paper: implementation of the EC Directive (97/11/EC) – determining the need for environmental assessment	1997	London: HMSO	Suggested GBP 35,000 as an appropriate median figure for the cost of undertaking an EIA under the new Regulations (cited in Glasson <i>et al.</i> , p. 234).

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
Department of the Environment (DoE)	Changes in the quality of environmental impact statements	1996	London: HMSO	<p>A study of 20 EISs showed EIS preparation to vary from 22 person-days at a cost of GBP 5,000 to 3-4 person-months with additional work contracted out. The report also found that EIA does not necessarily slow things down: “The more organised approach makes it more efficient and in some cases it allows issues to be picked up earlier. The EIS can thus speed up the system”. Many planning officers felt that dealing with the EIS and the planning application were one and the same and “just part of the job”. Estimates for reviewing the EIS and associated consultations ranged from five hours to 6-8 months of staff time. In the 20 case studies, the time spent by <i>consultees</i> on EIA ranged from four hours to one-and-a-half days for statutory consultees, and from one hour to two weeks for non-statutory consultees.</p> <p>On the benefits side, EIA is seen by <i>competent authorities</i> as a way to focus the mind, highlight important issues, reduce uncertainty, consider environmental impacts in a systematic manner, save time by removing the need for planning officers to collect the information themselves and identify problems early and direct them to the right people. One planning officer noted: “when the system first appeared I was rather sceptical because I believed we had always taken these matters into account. Now I am a big fan of the process. It enables me to focus on the detail of individual aspects at an early stage”.</p> <p><i>Consultees</i> broadly agree that EIA creates a more structured approach to handling planning applications, and that an EIS gives them “something to work from rather than having to dig around for information ourselves”. However, when issues are not covered in the EIS, consultees are left in the same position as with non-EIA applications: some of their objections are not because the impacts are bad but because they have not been given any information on the impacts or any explanation of why a particular impact has been left out of the assessment. Consultees feel that an EIA can give them data on sites that they would not otherwise be able to afford to collect themselves, and that it can help parties involved in an otherwise too often confrontational planning system to reach common ground. (Cited in Glasson <i>et al.</i>, 2005, p. 233-235).</p>

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
De Valk, Th. W.	Het milieu tot besluit, een evaluatie van de Nederlandse regeling milieu-effectrapportage	1997	PhD thesis, Vrije Universiteit Amsterdam	Compares the importance of the environmental issues in decision making in cases with and without EIA. Concludes that EIS have a positive, albeit not very high, effect on the decisions by the competent authority, but not on the decisions by the initiator..
Dipper, B., C. Jones and C. Wood	Monitoring and Post-Auditing in Environmental Impact Assessment: A Review	1998	<i>Journal of Environmental Planning and Management</i> 41 (6), November	EIA post-auditing seeks to assess the accuracy of predictions made in the EIA. The paper argues that the focus on pre-decision stages of EIA, and the neglect of post-decision monitoring and auditing stages, has severely constrained the maturation of EIA systems worldwide. A literature review examines the need for post-auditing, highlighting several benefits to EIA performance that could arise if the results were effectively used. This reveals that, in practice, post-auditing activities are not widespread, and suggests reasons why it is so. An overview of post-audit findings from a survey of published studies is then presented and it is concluded that there is much scope for raising the profile of post-auditing in EIA worldwide. Preliminary results from a UK post-auditing study based on eight projects are described.
Emmelin, L.	Evaluating environmental impact assessment systems. Part I: Theoretical and methodological considerations	1998	<i>Scandinavian Housing and Planning Research</i> 15, pp. 129-148	Addresses the problems of evaluating the functioning of EIA through an approach relating EIA to professional and organisational cultures in management and planning.
Environment Agency	A Handbook for Scoping Projects: Environmental Impact Assessment (EIA)	2002	Environment Agency, Bristol (UK)	Box 2 in Chapter 3 (p. 13) highlights the benefits of scoping.

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
European Commission	Environmental Impact Assessment in Europe - A Study on Costs and Benefits	1996a	Report prepared for the European Commission, DG XI, by Land Use Consultants in association with Eureco and Enviplan. ISBN 92-828-3572-3 (Volume 1- Main report) ISBN 92-828-3573-1 (Volume 2- Detailed case studies) Summary on: http://ec.europa.eu/environment/eia/eia-studies-and-reports/eia-costs-benefit-en.htm	This report contains the findings of a research study which has examined the relative costs and benefits associated with implementation of Environmental Impact Assessment in selected countries within the European Union. The study has been undertaken in two parts; the first dealing with Project EIA and the second relating to Strategic Impact Assessment. Some of the main findings on project EIA include the following: <ul style="list-style-type: none"> - in a majority of cases, costs of EIA amounted to less than 0.5% of the overall capital cost of the project. Costs in excess of 1% are the exception; - as a percentage of total cost, the EIA component becomes smaller the larger the project; - EIAs are usually completed in under 2 years, but there is considerable variation from project to project. Delays can occur for many reasons unrelated to the EIA process itself; - in a majority of cases, benefits were identified in terms of e.g. higher standards of mitigation and project re-siting or re-design to spare environmentally sensitive areas; - significant benefits were also recorded related to the enhancement of the developer's environmental credibility; - in many cases major benefits were achieved through the contribution which EIA makes in helping to define and confirm the conditions and formal agreements which form part of development consents; - in all cases the EIA process had resulted in benefits in terms of a better information base and framework for analysis for decision making.
European Commission	Evaluation of the Performance of the EIA Process	1996b	European Commission, Brussels (2 volumes) http://ec.europa.eu/environment/eia/eia-studies-and-reports/eiaperform.pdf	Assesses the quality of EIAs using a sample of 112 EIAs from 8 EU Member States. Volume 2 contains the 8 Member State reports.

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
European Commission	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.	2002 (?)	http://ec.europa.eu/environment/eia/pdf/report_en.pdf	This is the third review by the Commission of the implementation of the EIA Directive in the Member States, and the first one since the amendments of Directive 97/11. It addresses, inter alia, strengths, weaknesses and quality of EIA practice in the EU, but does not refer explicitly to costs and benefits.
Feldt, W.	UVP-Probleme bei Offshore-Windenergieparks in der AWZ.	2003	<i>UVP-report</i> , 17 (5), p.237-241.	This article deals with offshore wind energy parks. According to the Ordinance on Offshore Developments (Seeanlagenverordnung), the EIA act applies to projects requiring a consent according to Seeanlagenverordnung, section 2, and falling under the definition of project according to the EIA act, section 3. The case study of the offshore windpark Butendiek illustrates the practice of EIA for projects falling under the Seeanlagenverordnung. Furthermore, it is examined whether the decision on the location of offshore windparks is improved from the point of view of environmental precaution.

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Figge, F., and T. Hahn	Value-oriented impact assessment: the economics of a new approach to impact assessment	2004	<i>Journal of Environmental Planning and Management</i> 47 (6), p. 921	Environmental Impact Assessment has gained a prominent position as a tool to evaluate the environmental effects of economic activities. However, all approaches proposed so far use a burden-oriented logic. They concentrate on the different environmental impacts in order to ascertain the overall environmental damage caused by economic activity. This paper argues that such a burden-oriented view is (a) hampered by a series of methodological shortcomings which hinders its widespread use in practice; and (b) is analytically incomplete. The paper proposes a value-oriented approach to impact assessment. For this purpose an economic analysis of the optimal use of environmental and social resources is conducted from both a burden-oriented and a value-oriented standpoint. The basic logic of a value-oriented impact assessment is explained, as well as the resulting economic conditions for an optimal use of resources. In addition, it is shown that value- and burden-oriented approaches are complementary to achieve optimality. Finally, the paper discusses the conditions under which the use of burden- or value-oriented impact assessments is appropriate, respectively.
Fischer, Th. B.	Benefits arising from SEA application—a comparative review of North West England, Noord-Holland, and Brandenburg-Berlin	1999	<i>Environmental Impact Assessment Review</i> 19 (2), pp. 143-173	This article seeks to determine the extent to which current assessment practice of transport infrastructure-related policies, plans, and programs (PPPs) results in certain benefits of strategic environmental assessment (SEA) in three European Union regions. It is concluded that current assessment practice indeed results in certain SEA benefits, although to differing extents. It appears that there is more SEA-“related” experience in the European Union than is frequently anticipated in the academic literature. It is observed that case studies that were reviewed on a number of previous occasions and those that are included in this analysis do not necessarily appear to be “good practice” cases.

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Führ, M., K. Bizer, and A. Mengel	Evaluation des UVPG des Bundes. Auswirkungen des UVPG auf den Vollzug des Umweltrechts und die Durchführung von Zulassungsverfahren	2007	Sonderforschungsgruppe Institutionenanalyse, Darmstadt, in cooperation with the universities of Göttingen and Kassel	This is an ongoing research project. The project evaluates the German law implementing the EIA Directive. The final report, expected to be published in 2007, will include a cost-benefit analysis of EIA, recommendations for the further development of the German EIA law and measures for leaner administration. See Appendix II C for further information (based on an interview by Ecologic with the researchers).
Fürst, D, and F. Scholles	Handbuch Theorien + Methoden der Raum- und Umweltplanung	2001	Institut für Landesplanung und Raumforschung: Dortmund	This paper analyses EIAs with respect to methods and indicators used, as well as various ways to evaluate projects. Within the section, "Bewertungsmethoden", cost-benefit analysis is discussed. Aspects such as definition with respect to EIAs, aim, actual process of, including characteristics, and problems associated with cost benefit analysis are discussed. A case study of a Danube River project is used to further explore the aspects of cost-benefit analysis.
Garner, J.F., and T. O'Riordan	Environmental Impact Assessment in the Context of Economic Recession	1982	<i>The Geographical Journal</i> 148 (3), pp. 343-361	Lists a number of advantages of the (then proposed) EU EIA Directive in terms of developmental cost saving. States that EIAs rarely cost more than 0.6 per cent of final development costs but may speed up the application-permission process.
Glasson, J.	The first 10 years of the UK EIA system: Strengths, Weaknesses, Opportunities and Threats	1999	<i>Planning Practice & Research</i> 14 (93), pp. 363-375	The paper argues that there is an "implementation deficit" in the EU environmental policy (more policy than action). It also describes quality criteria for the EIA process and for the EIS, tracks changes in EIA quality in the UK pre- and post-1991 with objectivity of the EIA as the main issue of concern. Some of the strengths and weaknesses from the SWOT analysis could be translated into direct benefits and costs of the EIA directive.
Glasson, J., R. Therivel and A. Chadwick	Introduction to environmental impact assessment	2005	3 rd edition. Routledge, London and New York	Section 8.6 discusses costs and benefits of EIA, based on existing literature (see separate entries in this survey).

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
Haldorsson, O., and H. Sigurdardottir	EIA in Iceland 1994-2005 - The Impact of the Introduction of the Scoping Process	2006	Poster presented at the 26th IAIA Annual Conference, Stavanger, Norway, 23-26 May 2006 http://www.iaia.org/Non_Members/Confer-ence/IAIA06/abstracts%20volume%20final%20from%20Norway.pdf	<p>Formal EIA practice in Iceland started in 1994 with the enactment of an EIA act, based on EU-directive 85/337. The EIA act in Iceland has been revised twice since, first in the year 2000 and later in 2005. The main innovation in 2000 was the introduction of a formal procedure at the scoping level. This study focuses on the impacts of the introduction of the scoping document and the following procedure, which was meant to improve the EIA process in terms of quality, focus, efficiency and cost reduction.</p> <p>One of the aims of this study was to answer the question how successful the revision in year 2000 was in fulfilling this goal. To answer this question administrative cost of reviewing scoping documents and EIS's (by the National Planning Agency in Iceland) was used as an indicator of the overall outcome of the legislative change in 2000 in terms of efficiency and time/cost reduction. Different methods were used in the study. The main effort was put into a comprehensive review of all published scoping documents in Iceland and all EIS's published between 2000-2005 and calculations of working hours spent in the review of scoping documents.</p>

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Hanssen, M.	Norwegian EIA Research	2006	Paper presented at the 26th IAIA Annual Conference, Stavanger, Norway, 23-26 May 2006 http://www.iaia.org/Non_Members/Confer-ence/IAIA06/abstracts%20volume%20final%20from%20Norway.pdf	The paper presents an abridgement of the EIA research in Norway over the last 25 years, including the 9 years preceding the introduction of regulations in 1990. In the early years of the research, there was a focus on the implications for Norway of introducing the principles of EIA. During the first years of the regulations, the EU-directive and Espoo convention were still not implemented, and some research was directed towards what an implementation would imply. The first comprehensive study covered the first 6 years of the regulations, and has since been followed by a number of smaller issue specific studies. Just recently ended, we have seen a common project between the “Environmental Institutes” in Norway which has included theoretical involvement in analysing scoping, vulnerability, valuing, predictions and uncertainty, and common data needs in EIA and SEA. The paper presents the results of most of these studies and one ongoing of the reform of the EIA-regulations from 1 April 2005. None of these are really relevant for costs and benefits.
Haraldsson, H., and Á. Guðmundsdóttir	The Environmental Impact Assessment of Icelandic road projects	2003	In: T. Hilding-Rydevik and Á. Hlökk Theodórsdóttir (ed.), <i>Planning for Sustainable Development – the practice and potential of Environmental Assessment</i> . Proceedings from the 5 th Nordic Environmental Assessment Conference, Reykjavik, Iceland, 25-26 August 2003. Nordregio, Stockholm, 2004, pp. 247-254.. http://www.nordregio.se/Files/r0402.pdf	Contains information on the costs of EISs for road projects in Iceland. Between 1994 and 2002, 77 EISs have been prepared for 74 road projects, at a total cost of about EUR 4.5 mln, or EUR 56,000 per EIS on average. The range of costs was between EUR 8,900 and EUR 56,000. On average, the costs were estimated as: <ul style="list-style-type: none"> - 2-3% of the construction cost for smaller projects; - 1-2% of the construction cost for medium projects; - 0.5-1% of the construction cost for larger projects.

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Haunhorst, K.H., H. Heinelt and J. Taeger	The EIA Case Studies in Germany	2001	In Heinelt <i>et al.</i> (eds, 2001), pp. 71-106	Analyses 4 German EIA cases. In the most controversial one (relating to the deepening of the Ems river), the EIA procedure appeared to worsen the situation instead of defusing it.
Hedlund, Anders and Söderbaum, Peter	EIA/SEA – A Challenge to Decision-making, Planning and Policy-Making?	2005	Paper presented at the 25th IAIA Annual Conference, Boston, Massachusetts, 31 May-3 June, 2005. http://www.iaia.org/Non_Members/Conference/IAIA05/Publications/05%20AV.pdf	The purpose of EIA and SEA is to assure that environmental aspects are taken into account in planning and decision-making. But there is more to it: the procedures of EIA and SEA both have certain characteristics which are of interest from perspectives of ethics and science as well as planning theory and decision-making philosophy. The authors claim that EIA/SEA stands for an interdisciplinary, open-ended, disaggregated learning process with participation and interaction between actors, stakeholders and the public as key activities. The focus is to identify and assess significant negative impacts caused by an actual plan, programme or project. In this way, EIA/SEA supports planning and decision-making in cases when complex and adverse impacts are at stake. In itself EIA/SEA is not, and should not be, a planning tool or an instrument to implement overriding plans and policies. In practise, however, EIA/SEA tends to play an ambivalent role. At least in Sweden EIA/SEA sometimes is a closed process focusing on the assessment of compliance with environmental policy, objectives for environmental protection, and comprehensive plans and programmes. By this there is a risk that EIA/SEA becomes a instrument of top-down policy-making – at the expense of an open, transparent process and participative qualities. The authors believe that EIA/SEA, by putting emphasis on its characteristics, offers an approach that can significantly influence planning and decision-making to make it both more transparent and democratic and more compatible with sustainable development. In this paper, underlying ethical and scientific perspectives (and ideologies and philosophies) are illuminated in order to understand prerequisites and mechanisms for effective and efficient use of EIA/SEA. EIA/SEA is also discussed in relation to cost-benefit analysis, multi-criteria approaches and positional analysis.

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
Heinelt, H., et al. (eds.)	European Union environment policy and new forms of governance : a study of the implementation of the environmental impact assessment directive and the eco-management and audit scheme regulation in three member states	2001	Ashgate, Aldershot	Case study countries: Germany, Greece, UK (see separate chapter entries elsewhere in this table).
Hildén, M.	Myths and Reality in EIA and SEA	1999	Proceedings from the 3rd Nordic EIA/SEA Conference 22 - 23 November 1999	The report examines some commonly held beliefs and stories as well as existing practices and institutions and it analyses facts and events related to environmental impact assessment. Nothing on costs and benefits.
Hokkanen, P and Kojo, M	Ympäristövaikutusten arviointimenettelyn vaikutus päätöksentekoon	2003	Ministry of the Environment, Finland http://www.ymparisto.fi/download.asp?contentid=5412&lan=fi	This report studies the influence of environmental impact assessment (EIA) procedures on decisionmaking in three projects. These are studied with a view of formulating of alternatives. The decision-making process was divided into three time periods (prior to, during and after the EIA), and a comparison between these made it possible to pinpoint changes in the alternatives. In addition to the results of the EIA the study took into account the main factors influencing the decision-making. The report includes a brief discussion on how costs and benefits affect and frame the selection of alternatives but this is not elaborated on any further.

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
Hokkanen, P., Pölonen, I., Kuitunen, M., Hirvonen, K.	Effectiveness of Environmental Impact Assessment in Finland – Presentation of the EFEIA Pro- ject	2005	Paper presented at the 25th IAIA Annual Conference, Boston, Mas- sachusetts, 31 May-3 June, 2005. http://www.iaia.org/Non_Members/ Confer- ence/IAIA05/Publications/05%20A V.pdf	Despite their innovative aspects, Finnish EIA legislation and practices contain several gaps that weaken the preventive effect of the instrument. The main objective of the EFEIA project is to analyze and improve the effectiveness of environmental impact assessment. An additional objective is to provide structured information about the legal framework and case law related to the environmental impact assessment. Further, the aim is to increase the understanding of the mechanisms and the functions of the instrument and provide a comprehensive overview of the various effects of the EIA. EIA is seen in this study as a modern environmental policy instrument, which means that the role played by EIA in the field of environmental policy control will be located and analyzed. The approach to be used in the research is multidisciplinary, since the research subject will be approached from the perspectives of the legal, political and natural sciences. The core task of the EFEIA project will be to define the problems of EIA and to address these problems by means of versatile measures that draw on all three of the environmental sciences. The foundation of the environmental impact assessment is multidisciplinary. The effectiveness of the instrument is not based solely on the legal-administrative regulation but also essentially on the other factors as well, which are in part related to the transparency and participatory functions of the EIA process. Only applying a diversified methodology and a multidisciplinary approach can identify these factors and mechanisms. The research will produce a new kind of comprehensive information on the mechanisms and effectiveness of EIA. The outcomes of the EFEIA project will together form an extensive scientific basis for more effective EIA legislation and assessment practises to improve quality of the environment.

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
Hokkanen, P.	Ympäristövaikutusten Arviointimenettely politiik-kaverkostona-tapaustutkimus Kansalaisosallistumisesta ydin-jätteiden loppusijoitushank-keessa	2004	Licenciate thesis, Tampere Univer-sity http://tutkielmat.uta.fi/pdf/lisuri00015.pdf	The study assessed the participatory aspects of EIA based on empirical research and the EIA procedure for the nuclear waste storage in Posiva. The study found that the civil society participation through the institutionalised EIA procedure is not without problems. Only a few active groups participated in the Posiva EIA process and there where signs of “elitist political networks”. In the end the impact of the Posiva EIA on decision-making was marginal as most of the deci-sion-making context was framed by the requirements of the nuclear waste legis-lation.
Huhtinen, K.	Hankkeiden ympäristövaikutus-ten arviointimenettely Suomessa ja Tanskassa	2006	Master’s thesis, Helsinki University http://ethesis.helsinki.fi/julkaisut/bio/bioja/pg/huhtinen/hankkeid.pdf	The aim of the thesis is to explain how Finland and Denmark have implemented the EIA Directive. The study also examines EIA from the perspective of Plan-ning theories and the relationship between EIA consultation and participation as part of the planning process. The study found that the EIA Directive had changed the participatory practices in the planning system in both Finland and Denmark. Not really relevant in terms of costs and benefits but a good descrip-tion of the EIA process in Denmark and Finland
Hylding-Ridevik, T., and Á. Hlökk Theodórs-dóttir	Planning for Sustainable Devel-opment – the practice and po-tential of Environmental Assessment	2003	Proceedings from the 5th Nordic Environmental Assessment Confer-ence, Reykjavik, Iceland, 25 – 26 August 2003 http://www.nordregio.se/Files/r0402.pdf	

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Johansson, V., and A. Hedlund	Quality in EIA: The Swedish Case	2006	Paper presented at the 26th IAIA Annual Conference, Stavanger, Norway, 23-26 May 2006 http://www.iaia.org/Non_Members/Conference/IAIA06/abstracts%20volume%20final%20from%20Norway.pdf	One of the Swedish EIA characteristics is the extensive use of EIA. Another feature is the proponents' responsibility for the EIA process. The influence of authorities in the process is limited. No evaluations have been made of neither the quality of EIAs nor the EIA-process in Sweden since the Council Directive on environmental assessment was implemented in Swedish legislation in the 1990's. However, several studies (the Swedish National Audit Office 1996, the Board of Housing and Planning 2003, Emmelin & Lerman 2004) have indicated that there might be some problems with the EIA quality and the EIA-process in Sweden. In order to investigate these possible problems a webquestionnaire was distributed by the Swedish EIA Centre in December 2005. The focus of the questionnaire was to investigate how proponents, consultants, decision-makers, reviewers and researchers consider the aim, function, quality and effective use of EIA. The questionnaire covered five areas i.e. aim, function, quality and actor relations. It was sent to approximately 1500 persons and 342 answers were received. The result of the questionnaire shows deficiencies in several areas, both concerning legislation and the application of the legislation as well as regarding competence and organisation matters.
Jones, C.E.	The effect of environmental assessments on planning decisions	1995	<i>Report</i> , special edition, October, pp. 5-7	Competent authorities generally feel that projects and the environment benefit greatly from EIA. When asked whether EIA was a net benefit or cost, "the overwhelming response from both planning officers and developers/consultants was that it had been a benefit. Only a small percentage of both respondents felt that EIA had been a drawback" (cited in Glasson <i>et al.</i> , 2005, p. 235-236).
Jones, C., C. Wood, and B. Dipper	Environmental assessment in the UK planning process	1998	<i>Town Planning Review</i> 69, pp. 315-319	Only one-fifth of developers and consultants felt that there had been no benefits associated with EIA (cited in Glasson <i>et al.</i> , 2005, p. 235).
Kanning, H.; Wulfert, K.	Verbesserung der Ökoeffektivität betrieblichen Umweltmanagements durch Beiträge der Landschaftsplanung	2003	<i>UVP-report</i> 17 (1), p.34-38.	Analysis methods, basic determination; Environmental audit of operating results; Landscape planning for building zoning plan.

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
Karr, K.	Environmental Impact Assessment in the United Kingdom and Germany. A Comparison of EIA Practice for Wastewater Treatment Plants	1997	Ashgate, Aldershot	This book is based on PhD research undertaken at the University of Manchester. Its aims are threefold: to compare EIA practice for wastewater treatment plants in the United Kingdom and Germany within its cultural and institutional context; to explain similarities and differences; and to suggest improvements to both EIA systems.

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
Kessel, H. J. B. A. van, T. J. Boer, B.G.M. Roelofs en K. A. Klein Ko- erkamp	Evaluatie m.e.r. 2003	2003	Novio Consult, Nijmegen	<p>This is the third evaluation of the Dutch EIA system. Its objectives are:</p> <ul style="list-style-type: none"> - to assess the effectiveness and efficiency of EIA and to identify opportunities for improvement and simplification; - to give insight in the possibilities for further improvement of the cohesion between (and possible integration of) the government's impact assessment instruments. <p>The report contains a section (4.7) on "Costs and benefits of EIA". It distinguishes a number of cost items (for the project developer, the authorities and for the management of the EIA system), which can only partly be quantified in financial terms. It states that international research shows that the direct expenses for studies and the EIS are usually less than 1% of the project costs. This is confirmed by the experience of Rijkswaterstaat (one of the biggest executors of EIA in the Netherlands). Other project developers confirm that EIA costs are limited in comparison with the investment costs of the project. Higher and more serious costs occur if a project is postponed due to the EIA process (e.g. in case of activities for which EIA is discretionary). The costs of EIA can be reduced and its efficiency improved by means of various measures, including better scoping (restricting the EIA to information that is relevant for the decision) and the use of models and standard elements (as applied in Canada and Australia), possibly supplemented by location specific tailored research.</p> <p>On benefits, the evaluation states that these are even harder to quantify than costs. As direct benefits of EIA it mentions the sparing of sensitive areas, mitigation of negative impacts, more support for a project, and more environmental awareness among parties involved.</p>

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
Kempenaar, Christa	Quality in control? An evaluation of the quality, costs and time of Dutch EIA-studies for road projects.	2005	<p>Paper presented at the 25th IAIA Annual Conference, Boston, Massachusetts, 31 May-3 June, 2005.</p> <p>http://www.iaia.org/Non_Members/Confer-ence/IAIA05/Abstract%20Submissions/view_abstracts1.asp</p>	<p>A common complaint about Environmental Impact Assessment (EIA) is that EIA studies are considered costly, lengthy, outdated and suffer from information overload. This issue is acknowledged by the Dutch Ministry of Transport – one of major players in the EIA field in the Netherlands, being responsible for the development of the majority of EIA road projects. In order to keep EIA fit-for-purpose for the 21st century, the Ministry has carried out a research programme. The research addressed such questions as: What are the costs of EIA-studies? What time period is needed for preparing them? What is the quality of the resulting studies? How are these three dimensions related? And, how to control them better? By the way, the research programme focused on the EIA-studies not on the road development projects themselves. The research included the analysis of documents and management data, surveys and interviews. In order to get a balanced view from both inside and outside the Ministry of Transport, a variety of parties have been consulted in the research: project managers, political administrators of the Ministry as well as the independent EIA Commission and commercial consultancies. This paper provides an overview of the main conclusions on quality, costs and time of EIAs for road projects. First an analysis is given of the actual costs and time of the EIA studies and the factors that influence the quality, costs and time (efficiency and effectiveness). Subsequently, the relationships and trade-offs between these three dimensions are discussed. Then, the paper addresses ways for controlling the quality as well as the costs and time in future EIA-studies. One of the major conclusions is that a careful time management of projects provides the Ministry a useful control mechanism for managing the costs and quality of EIA-studies.</p>

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Klaffl, I., <i>et al.</i>	UVP-Evaluation. Evaluation der Umweltverträglichkeitsprüfung in Österreich	2006	Report REP-0036, Umweltbundesamt, Vienna http://www.umweltbundesamt.at/fileadmin/site/publikationen/REP0036.pdf	This study aimed at assessing the quality and effectiveness of EIA in Austria and at checking if EIA brings ‘value added’ to the environment. It highlights various benefits of EIA (including e.g. higher acceptance of the proposed project and less conflicts), but does not contain any attempts to quantify or monetise these benefits. Likewise, the costs of EIA are addressed in terms of their influence on the project and the procedure; this influence appears to be insignificant, but the costs are not quantified.
Kobus, D., and N. Lee	The role of environmental assessment in the planning and authorisation of extractive industry projects	1993	<i>Project Appraisal</i> 8 (3), pp. 147-156	Provides some information on the influence of EIA on project modification (and hence on possible benefits of EIA). Within a sample of 22 projects, about half were modified by the decision to prepare an EIS and hold consultations. Most changes, however, were minor.

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
<u>Kørnøv, L., P. Christensen, and E. Nielsen</u>	Mission Impossible: Does EIA secure a Holistic Approach to the Environment?	2003	Department of Development and Planning, Aalborg University http://vbn.aau.dk/fbspretrieve/170715/abstractfil.pdf	<p>To evaluate the experiences of EIA so far, Aalborg University was asked to evaluate existing EIA practice in Denmark under the heading: “What do we get out of EIA?” The evaluation was performed for the Ministry of the Environment during the period 2001 – 2003.</p> <p>The results are based upon in-depth studies of 36 EIA cases. The case studies cover three different types of projects: Industry, infrastructure and livestock projects.</p> <p>On average, an EIA takes approximately 22 months. Industry cases can be handled in 13 months, while infrastructure cases can take up to 2½ years. The report points out that even if this may seem a long time, one has to remember that the EIA process includes public hearings as well as political processes. There also has to be time to carry out a comprehensive analysis, which is based upon a dialogue with the applicant and other stakeholders and which is very broad and holistic in nature.</p> <p>The report also found that contrary to the positive use of a broad concept of the environment is that considerations of socioeconomic aspects are seldom taken into consideration. Moreover, the assessment of cumulative aspects never takes place. Socio-economic impacts are described in 82% of infrastructure cases, 50% of industry cases, and only 15% of livestock projects cases.</p>
Lee, N.	Environmental Assessment in the European Union: a Tenth Anniversary	1995	<i>Project Appraisal</i> 10 (2), pp. 77-90	<p>The main reference to costs and benefits in this article is based on the European Commission’s 1993 evaluation. “It was found that [...] in some Member States, “there is clear evidence that project modifications have been, and are, taking place, due to the influence of the EIA process”.[...] Further, it was concluded [...] that the benefit had been achieved at relatively low EIA process and mitigation costs and without significantly affecting the overall timescale of implementing projects.”</p>

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Lee, N., and D. Brown	Quality control in environmental assessment	1992	<i>Project Appraisal</i> 7 (1), pp. 41-45	About half of the officers interviewed felt that the EIS had not influenced how long it took to reach a decision; the rest were about evenly split between those who felt that the EIA had speeded up or slowed down the process (cited in Glasson <i>et al.</i> , 2005, p. 234).
Lee, N., and R. Dancey	The Quality of Environmental Impact Statements in Ireland and the United Kingdom: a Comparative Analysis	1993	<i>Project Appraisal</i> 8 (1), pp. 31-36	The quality of EISs produced in Ireland and the UK is assessed and compared, using the same Environmental Statement Review Package. In both countries, high percentages of EISs were unsatisfactory in the late 1980s but, subsequently, considerable improvements have been achieved.
Lee, N., F. Walsh, and G. Reeder	Assessing the Performance of the EIA Process	1994	<i>Project Appraisal</i> 9 (3), pp. 161-172	Based on a sample of some 50 projects in the UK, this article concludes that the Environmental Assessment (EA) process has contributed to environmental improvements of varying levels of significance, through project modifications, in approximately half the cases which have been investigated. EA has also made an observable contribution, although possibly in a minority of cases, to better informed and more balanced project appraisal and decision-making. In the majority of cases, any cost increases associated with the EA process have been minor and there is some evidence that the time taken to process planning applications, subject to EA, may have been falling, particularly when satisfactory Environmental Statements (ESs) have been submitted. However, whilst the EA process has brought tangible benefits in those cases where it has operated reasonably effectively, the full potential benefits have not been realised because, in a significant number of other cases, deficiencies in overall environmental effectiveness, cost-effectiveness and decision-making have still occurred. There is considerable variability in the quality of ESs, in the length of time devoted to the pre-ES submission phase, and in the use made of the ES in reaching decisions.
Leknes, E.	The role of EIA in the decision-making process	2000	<i>Environmental Impact Assessment Review</i> 21, pp.309-334	The focus of this paper is to clarify the role the EIA can have in the decision making process. Three common decision theoretical perspectives are used to illustrate the decision-making process. By using examples from the Norwegian petroleum sector it shows how the importance of the EIA in decision-making varies across different typologies of issues.

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Leu, W.-S., W.P. Williams, and A.W. Bark	An evaluation of the implementation of environmental assessment by UK local authorities	1995	<i>Project Appraisal</i> 10 (2), pp. 91-102	Contains figures on the costs of hiring consultants to help local authorities in assessing EISs (which only 30.5% of the surveyed authorities actually did). In more than 50% of the cases, the costs were less than GBP 5,000. In 5% of the cases they exceeded GBP 20,000.
Lund, H. and Hvelplund, F.	Does environmental impact assessment really support technological change? Analyzing alternatives to coal-fired power stations in Denmark	1997	<i>Environmental Impact Assessment Review</i> 17, pp.357-370	According to the Danish implementation of the directive, an EIA must review a project's main alternatives and the environmental consequences of the alternatives. If this were done properly, EIAs could assist Denmark in meeting its CO2 reduction goals. However, because EIA is implemented on a restricted, regional basis, it does not support technological change. Responsibility for the preparation of the EIA is given to the regional authorities through a law which does not require alternatives to be assessed that extend geographically beyond the boundaries of a regional authority. Thus, there is no certainty of serious analysis of cleaner technology alternatives to large coal-fired power stations. This conclusion is based on examination of three case studies using a participatory research method.
Marr, K., and C. Wood	A comparative analysis of EIA practice for wastewater	1996	<i>International Planning Studies</i> 1 (2), pp. 217-228	This article reports the findings of an investigation of the practice of EIA for wastewater treatment plants in the UK and Germany. It demonstrates that both EIA systems have a number of common deficiencies but that the differences between the practice of EIA in Britain and Germany are considerable. These indicate that one of the objectives of the European Directive – to harmonize environmental controls – has not been met. No reference to costs or benefits.

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Marshall, R.	Environmental impact assessment follow-up and its benefits for industry	2005	<i>Impact Assessment and Project Appraisal</i> 23 (3), pp. 191-196	Applying follow-up within environmental impact assessment (EIA) is no longer an option but a sound precaution and a proactive measure in today's heavily regulated industrial environment, where the announcement of new development is treated with dismay and opposition by local residents. Increasingly, successful development is viewed in terms of its final result — its operational environmental performance, its acceptance by stakeholders, its contribution to sustainable development, and, critically, the scale or magnitude of environmental impact over all life-cycle phases. For astute proponents, the evidence suggests that EIA follow-up has a valuable role to play in good developmental practice. It can also encourage integration of environmental perspectives into developmental programmes, the systematic implementation of mitigation and the triggering of environmental risk responses posed through construction activities. This paper shares experience with EIA follow-up from an industry practitioner's viewpoint to assist with learning from experience and capacity building. Seven perceived functions of EIA follow-up are examined alongside specific case studies.
Messner, Frank	Ansätze zur Bewertung von Naturqualitäten im regionalen Entwicklungsprozess	2005	In: Elsner, W.; Biesecker, A.; Grenzdörffer, K. (Hrg.): <i>Ökonomische Bewertungen in gesellschaftlichen Prozessen: Markt – Macht – Diskurs</i> , Centaurus Verlag, Herbolzheim, S. 189-216.	This paper analyses regional development projects and their impacts on the environment and the people who live in proximity to these projects. It discusses the various criteria to evaluate conflicts between economic development and natural resource protection, using gravel and sand extraction projects as an example. The paper discusses using cost-benefit analyses to measure the welfare effects of projects, such as the monetary profits and losses to persons in the surrounding area.
Michel, P.	L'étude d'impact sur l'environnement	2001	BCEOM, pour le Ministère de l'Ecologie et du Développement Durable	See BIO report on France (Appendix II)

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Miljøverndepartementet (Norwegian Ministry of the Environment)	Environmental impact assessment	2003	www.miljo.no	“Evaluation studies of the Norwegian EIA process show that EIA creates an orderly planning process, enhances the role of the public concerned in the planning and decision making process and produces a broader knowledge base for decisionmaking. More specifically, EIA functions as a uniform process that structures the co-operation between developer, relevant governmental bodies at the appropriate levels, and the public. The studies also show that the early phase is important. Especially the study programme is an important element of the EIA process, as it contributes to focus on the crucial issues to be addressed in the EIA report. EIA provides knowledge and consciousness of environmental impacts, and also leads to a more thorough planning process. It helps to achieve alterations in design and implementation of projects in order to enhance environmental performance. The cost of EIA varies, but does not normally exceed 0.1 - 0.5 % of the total project costs. There is no documented project delay for projects that are assessed according to the EIA provisions.” (p. 6)
Moreno, A.-M.	Environmental Impact Assessment in EC Law : a Critical Appraisal	2006	In: R. Macrory (ed.), <i>Reflections on 30 years of EU environmental law : a high level of protection?</i> Europa Law Publishing, Groningen, pp. 41-59.	Discusses a number of (legal) weaknesses of Directive 85/337. Nevertheless, the author considers EIA to have led to “more effective and efficient environmental protection throughout the European Union” (p. 58).
Naturvårdsverket	MKB under utveckling. Tidiga erfarenheter av MKB enligt miljöbalken och förslag på fortsatt utvärdering	2001	Report no. 5150, Swedish Environmental Protection Agency, Stockholm	Reports on the early experiences with the new Swedish EIA system. In interviews, the initiators of projects stated that the costs of an EIA were reasonable in relation to their projects. However, large indirect costs are involved in the time lags that the EIA procedure sometimes creates, mainly due to a lack of resources at the authorities. It is recommended to investigate the differences in costs and time involved in different types of projects and between the different authorities in different parts of the country.

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Nielsen, E., P. Christensen, and L. Kørnøv	Are screening processes effective instruments and what are the environmental benefits?	2003	Department of Development and Planning, Aalborg University http://vbn.aau.dk/fbspretrieve/170122/abstractfil.pdf	<p>During 2001-2003, the counties (county councils) in Denmark have conducted around 2000 screening decisions for project categories listed in Annex II of the EIA directive. Approximately 3% of these decisions lead to an EIA. The Ministry of the Environment asked Aalborg University to conduct an evaluation of the Danish experience with EIA. The evaluation tries to assess if the screening processes is a cost-effective instrument and to what extent are the environmental benefits for this large number of projects covered by the screening regulation?</p> <p>The report found that the screening instrument is considered efficient in terms of securing an environmental optimisation of the projects. Almost half of the projects have been changed and the changes have primarily been preventive measures. Efficiency is judged by not only the capacity of screening to change the project, however, but also by the fact that the authorities use very few resources. This instrument seems to be an "eye-opener" for the developers, furthermore, one that signals many opportunities for adjustment and optimisation of project from an environmental point of view.</p> <p>According to the consultants and developers, changes in projects will lead to less pollution than the project as originally planned. Changes in livestock projects will mean a reduction in nitrogen emissions, less impact on nature-protected areas and landscapes, and minimisation of environmental impacts on neighbours.</p>
Nieslong, C.	An Evaluation of the effectiveness of Environmental Impact Assessment in promoting Sustainable Development.	2004	Cordula Nieslong: Master's Thesis	<p>This paper, using German EIAs as a case study, discusses the creation of a sustainability appraisal tool in the context of environmental impact assessment. Through a survey, various EIA stakeholders were asked to define sustainable development within the EIA context as well as discuss the potential implementation of sustainable development ideas within EIAs. Furthermore, stakeholders were asked to analyse the effectiveness of the current EIA process. In addition to the survey, three EIAs from Germany were analysed, including an analysis of costs. This analysis included a discussion of direct costs of doing an EIA, i.e. paying for experts, as well as the costs of mitigation measures.</p> <p>(No more empirical data available)</p>

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
Njål, A, Asbjørg, N and Rolv, L	Nytte og ressersbruk ved konsekvensutredninger, Studie av et utvalg konsekvensutredninger etter plan-og bygningslovens bestemmelser	2005	A report by Civitas	<p>The main aim of this study is to:</p> <ul style="list-style-type: none"> • Assess the costs and benefits of selected EIAs • Assess whether the resources used in the EIA are comparable to the benefits <p>The study consists of seven EIAs focusing on the process, benefits and resource use and eleven complementing EIAs with a greater focus on costs. A table shows an estimation of the total costs, the costs of the EIA, EIA costs compared to the total costs in per cent and for starting the EIA to its completion. The EIA costs vary mostly between 0.1 and 2.2 per cent of the total costs. The time spent on the EIA ranges from 18 to 70 months.</p> <p>The report found it difficult to distinguish the costs from a road project from the municipal plan, as these tend to develop in parallel. It was estimated that the EIA costs for the E39 Gartnerlokka – Klepland road were 33 per cent of the total municipal plan costs.</p> <p>The benefits (to different actors) of the EIA were based on interviews and questionnaires. So for instance the different actors were asked to answer to the question “What was the benefit of the EIA in relation to costs?”, on a scale from -2 to +2. Of the seven EIA projects in six the benefits were deemed to outweigh the costs. The benefits have not been monetized.</p> <p>(See Appendix II D for more extensive summary)</p>

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Obroučka, K., <i>et al.</i>	Economic evaluation of ecological risks of EIA and IPPC procedures	2005	Final report to the project carried out with the National Research and Development Programme – VaV 750/01/03. University of Management, Ostrava	Includes an estimate of EIA costs for a representative sample of projects in the Czech Republic. The costs are dependent on: a. Type of the project (a key criterion) b. Location of the project (sensitive location versus existing industrial premises) c. Competent authority (larger cities have higher standards). Category I investments are 5.4 times more costly than Category II investments. The highest costs are found for industrial production projects in Category I; these range from € 6,600 to € 21,700. (See Appendix II E for more extensive summary)
Palerm, J.R.	Public participation in environmental impact assessment in Spain: three case studies evaluating national, Catalan and Balearic legislation	1999	<i>Impact Assessment and Project Appraisal</i> 17 (4), pp. 259-271.	Each of the 17 Spanish autonomous communities can define their own environmental impact assessment (EIA) legislation. This paper examines three case studies, falling under different legislation, and making use of different public participation mechanisms.
Palerm, J.R., and W.R. Sheate	Environmental impact assessment in Central and Eastern Europe: lessons from the Czech Republic and Romania	1996	<i>European Environmental Law Review</i> , pp. 15–22	Describes the EIA systems of the Czech Republic and Romania, and compares them to the UK and Spain. No reference to costs or benefits.
Petts, J. (ed.)	Handbook of Environmental Impact Assessment. Volume 2: Environmental Impact Assessment in Practice: Impact and Limitations	1999	Blackwell Science, Oxford	See separate entries on chapters elsewhere in this list.

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
Pieters, S.	Milieu-effectrapportage op de Herijkingshelling?	2004	<i>Milieu & Recht</i> 31 (1), pp. 24-25.	Challenges the proposals by the Dutch government to eliminate the provisions in Dutch EIA legislation that go beyond the minimum required by the EU Directive. The author argues that the proposals fail to take into account the benefits of the present Dutch EIA system. Moreover, he expects that the cost savings may be less than expected. Even if a simplification of the EIA procedure would lead to time savings, these may be offset by the additional court procedures that will follow due to the reduced public participation.
Piper, J.M.	Cumulative effects assessment on the Middle Humber: Barriers overcome, benefits derived	2000	<i>Journal of Environmental Planning & Management</i> 43 (3), pp. 369-387; cited in Glasson <i>et al.</i> (2005), pp. 272-275	Assesses the costs and benefits associated with CEA (a specific type of EIA, taking into account the cumulative effects of several projects in the same area), drawing on interviews with those involved in the process. Three of the four <i>developers</i> felt that the CEA process had increased their understanding of the estuary and the potential impacts of the proposed developments. Other benefits identified included the development of local relationships; the establishment of a consistent basis for mitigation and monitoring; the opportunity to share the costs of monitoring; and (for one of the developers) the fact that the CEA process had facilitated the rapid achievement of planning approval. The CEA process resulted in some changes in the original project proposals and additional mitigation measures, which would not have occurred if the projects had been assessed separately. Views differed about whether the CEA process had resulted in a saving or loss of time in obtaining consent for the proposed schemes. The <i>authorities</i> also identified a number of benefits from the CEA process, mainly in terms of awareness of the impacts

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
Pölonen, Ismo	Quality control and the substantive influence of environmental impact assessment in Finland	2006	<i>Environmental Impact Assessment Review</i> 26, pp. 481-491	This paper focuses on the challenges concerning the quality assurance of environmental impact statements (EIS) in Finland and the European Union. Moreover, the linkage between environmental impact assessment and decision-making is examined from a legal point of view. In addition, the paper includes some comparative remarks concerning the content requirements of examination of alternatives. The study reveals that a significant problem of the Finnish EIA system is the lack of efficient access to a judicial procedure to challenge the quality and completeness of an EIS. Another pitfall is the fact that in certain permit procedures, environmental consideration is so limited that only a minor part of the EIA can be taken into account. In its current state, EIA legislation in the EU and in Finland does not guarantee that the assessment results filter into decision-making. From the national point of view, the shortcomings can be addressed by amending current legislation concerning licensing procedures so that authorities have the competence and the duty to take environmental matters widely into account in the permit consideration. At the European level, a legislative alternative could be to strengthen the substantive element of the EIA Directive (85/337/EEC). This would increase the weight of EIA related arguments in the national appellate procedures and contribute, in some cases significantly, to the substantive influence of EIA in decision-making.
Pritchard, G., C. Wood, and C.E. Jones	The effect of environmental assessment on extractive industry planning decisions	1995	<i>Mineral Planning</i> 65 (December), pp. 14-16	This study of eight EIAs found that developers felt that ‘the preparation of the ES had cost them too much time and money, and that the large amounts of work involved in EA often yielded few tangible benefits in terms of the actual planning decision reached’ (cited in Glasson <i>et al.</i> , 2005, p. 234).

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Radnai, A., and Z. Mondok	Environmental Impact Assessment Implementation in Hungary	2000	In: Bellinger, E., <i>et al.</i> (eds.), <i>Environmental Assessment in Countries in Transition</i> . CEU Press, Budapest (p. 57-62)	<p>A new EIA system was introduced in Hungary in 1993. "The establishment of the necessary legal, administrative and educational arrangements took place more or less simultaneously with the adoption of the regulation. At the beginning of application particularly it was confusing and slowed down the procedure. Another efficiency decreasing factor was very tight administrative deadlines for the authorities. This meant a lack of in-depth analysis of issues and it often resulted in too general or superficial terms of reference for the detailed assessment. It also occurred that either the authorities have demanded unnecessary data or measures, or the submitted EIS contained a vast amount of unimportant information. As well as the previously mentioned reason, this is partly due to the intention of both authorities and proponents to 'simplify' the procedure, which actually means ignoring scoping.</p> <p>On the other hand, in several cases the EIA procedure has promoted better cooperation among the concerned authorities and the proponent. Where regular contacts took place among the concerned parties the EIA was properly focused and it was easier to identify a mutually acceptable solution. The introduction of the new EIA regulation has produced beneficial impacts in several sectoral planning systems, enforcing broader consideration of environmental factors and also giving impetus to elaborate sectoral environmental guidelines."</p>

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
Ross, W.A., Morrison-Saunders, a., Marshall, R.	Common sense in environmental impact assessment: it is not as common as it should be	2006	<i>Impact Assessment and Project Appraisal 24 (1), pp. 3-22</i>	Reviews of environmental impact assessment (EIA) practice, particularly by industrial proponents, have highlighted common shortfalls. EIA would benefit from more 'common sense', which is not very common. For example, issue scoping usually includes too many inconsequential factors, and issues not directly affecting project decisions. There is special emphasis on the problem of regulators' unwillingness to be decisive on what matters are to be addressed through EIA. Consideration of significance is often vague, misleading or inconsistent and the criteria for significance are often poorly explained, contradictory or insufficiently assessed. Quality of environmental impact statements (EISs) leaves much to be desired, with EIS documents of little use to stakeholders. EIA guidance is a possible solution but is not always focused or applied sensibly. The article suggests more effective signals from government EIA regulators to project proponents to overcome these difficulties, with the primary intention to evoke discussion and provoke practitioners to take up the fight to improve the quality and integrity of EIAs.
Ruijgrok, E., and D. Bel	Kostenbesparing door samenwerking	2004	<i>KenMERken 11 (5), October 2004, pp. 8-11</i>	Argues that costs can be saved in cases where both EIA and cost benefit assessment (CBA) procedures have to be performed, by using the same information sources as much as possible. This requires co-operation between the EIA and CBA teams.

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Saarikosi, H.	Environmental Impact Assessment as collaborative learning process	2000	<i>Environmental Impact Assessment Review 20</i> , pp. 681-700	<p>The study points to the EIA as a learning and civic discovery process where people can act together and find new solutions. During the process, the participants are able to reflect on their preferences and factual beliefs and create a previously unconsidered strategy. These insights are based on the collaborative problem-solving approach that was applied to environmental impact assessment of regional waste management strategy in Pirkanmaa, Finland. Various actors—interest groups, authorities, and experts—were invited to engage in joint fact finding and to exchange their views on the goals of alternative waste management strategies.</p> <p>The potential for learning and finding mutually acceptable solutions depended, however, on the legitimacy and institutional settings of the process: to what extent different perspectives were considered in the process, not only included, and how EIA was connected to a political decision-making process.</p>
Sadler, B.	Environmental assessment in a changing world: evaluating practice to improve performance	1996	Final report. International study of the effectiveness of environmental assessment, CEAA, Hull, Quebec	<p>EIA is seen as contributing directly to sustainability by leading to the withdrawal of environmentally unsound proposals and the mitigation of environmental impacts. The indirect benefits are also important. EIA is a learning process, providing important benefits beyond informing decision makers, such as the promotion of greater awareness of environmental and social concerns, upgrading of professional capabilities, and promoting public involvement in decision making (p. ii-iii; quoted in Wood, 1999).</p> <p>According to a majority of EIA practitioners, the benefits of EIA tend to outweigh the costs of application (“always”: 17 per cent; “often”: 32 per cent; “sometimes”: 31 per cent) (quoted in Emmelin, 1998, p. 138, figure 2 and note 7).</p>

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Sadler, B.	Ex-post evaluation of the effectiveness of environmental assessment.	1998	In: Porter, A.L. and Fittipaldi, J.J., Editors, 1998. Environmental methods review: retooling impact assessment for the new century, The Press Club, Fargo, ND, pp. 30–40.	<p>This paper provides a brief review of approaches and methods for ex-post evaluation of the overall effectiveness of the Environmental Assessment (EA) process and describes recent examples of their application. It identifies six types or categories of effectiveness review:</p> <ul style="list-style-type: none"> ▪ auditing and reporting for EA systems; ▪ implementation review and follow up studies; ▪ effects monitoring and impact auditing; ▪ review of EIS quality; ▪ decision-centered analysis; ▪ post-project analysis. <p>Includes a number of recommendations for improvement of effectiveness reviews. No specific reference to costs or benefits.</p>
Sadler, B., and R. Verheem	Country Status Reports on Environmental Impact Assessment	1997	Environmental Impact Assessment Commission, Utrecht, The Netherlands	Internationally, most EIA reports cost less than USD 100,000 and are processed in less than 18 months (p. 14; quoted in Wood, 1999).
Sager, F., and W. Schenkel.	Evaluation der Umweltverträglichkeitsprüfung	2003	Bern	<p>This evaluation examines the effects of EIAs on the implementation of environmental protection regulations and develops concrete proposals for improvements using relevant case studies. The study discusses the effects of the EIAs on projects themselves, as well as effects on procedure. The study found that EIAs positively impact projects with respect to environmental concerns. At the building phase, the study determined that effects from construction were better clarified when an EIA was undertaken than when no EIA was done. Furthermore, in some cases negative effects from building were more mitigated under the EIA process than without an EIA. Cost-benefit analysis was undertaken in the case studies used in this publication and is discussed in terms of long-term and short-term monetary values; however, cost-benefit analysis was not a central theme of the study. The study found that the cost issue was less of an issue with big projects than with smaller ones. The study also identifies weaknesses of the current EIA process.</p>

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Stookes, P.	Getting to the real EIA	2003	<i>Journal of Environmental Law</i> 15 (2), pp. 141-152	The paper discusses mostly the benefits and circumstances of the public participation element of the EIA process, with a focus on the situation in the UK. Costs and benefits are mentioned but only as a summary of the results of the EC study on costs and benefits of the EIA (1996).
Ten Heuvelhof, E., and C. Nauta	The effects of environmental impact assessment in the Netherlands	1997	<i>Project Appraisal</i> 12 (1), pp. 25–30	Summarizes the results of the second evaluation of the Dutch EIA system. In 79% of the cases studied, EIA appeared to have had a direct impact on decision making. It was also investigated whether EIAs had a ‘net beneficial impact’, i.e. if the efforts, costs and time involved were compensated for by the impact achieved. According to respondents (including initiators, authorities and independent experts) there was a net beneficial impact in 69% of the cases.
Tennoi, A., Kværner, J., Gjerstad, K.I.	Uncertainty in environmental impact assessment predictions: the need for better communication and more transparency	2006	<i>Impact Assessment and Project Appraisal</i> 24 (1), pp. 45-56	Uncertainty is almost unavoidable in environmental impact assessment (EIA) predictions, for complex and manifold reasons. In this paper, evidence is presented that decision-makers and other stakeholders are often not made aware that such uncertainty exists. Also, they are given only limited access to information about input data and the assumptions underlying predictions. It is argued that more emphasis should be given to improving the communication of uncertainty in EIA predictions and to making the prediction processes more transparent in order to improve EIA as a decision-aiding tool. The discussion is based on a study including 22 cases.
Varma, A.	Costs and benefits of the EIA Directive	2007?	GHK consulting	GHK consulting is commissioned by DG Enterprise to write a study on costs and benefits of the EIA Directive.
Wattage P.; Smith A.; Pitts C.; McDonald A.; Kay D	Integrating environmental impact, contingent valuation and cost-benefit analysis: empirical evidence for an alternative perspective	2000	<i>Impact Assessment and Project Appraisal</i> , 18 (1), pp. 5-14	The article calculates the costs and benefits of river quality improvement and does not consider costs and benefits of the EIA process itself.
Weaver, A., and P. Caldwell	Environmental Impact Assessment for Mining Projects	1999	In: Petts (ed., 1999), chapter 18, pp. 377-403	Lists the potential benefits of EIA for mining projects to different stakeholders, without substantiating evidence or any attempt to quantify them.

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Wende, W.	Praxis der Umweltverträglichkeitsprüfung und ihr Einfluss auf Zulassungsverfahren	2001	Berlin	This book analyses 145 projects undertaken in Germany to evaluate the effectiveness of EIAs. By using projects where EIAs were not done as well as projects where EIAs were undertaken, the author establishes that EIAs have a positive effect on potentially significant environmental impacts surrounding development. The author uses the extent of spatial modifications after an EIA is done to determine the effectiveness of an EIA. The study determined that EIAs cause more spatial modifications to a project than a project that has no EIA. However, the study determined that EIAs do not significantly impact decisions surrounding emissions and water restrictions. See summary below for other determinations of the study.
Wende, W.	Evaluation of the effectiveness and quality of environmental impact assessment in the Federal Republic of Germany	2002	<i>Impact Assessment and Project Appraisal</i> 20 (2), pp. 93-99(7)	This study uses empirical research of 145 projects on environmental impact assessment (EIA). The researchers generated and tested hypotheses based on questions about the effectiveness and quality of EIA. By means of EIA, aspects of proactive thinking have entered into procedural decisions more than previously presumed and modifications in the spatial dimensions of projects have played an especially prominent role. The three most important factors affecting the scale of general project modifications are: the degree to which the subject matter and methodological aspects of a study are prescribed by §5 of the EIA Act (Scoping); the early, intense involvement of authorities, experts, and third parties in the scoping; and the degree to which the project's effects and impacts are analyzed and forecast in the environmental impact study (EIS). EIA and EIS practice has moved beyond the 'experimental phase' and routines have now emerged for certain parts of the procedure. The study concludes that EIAs in Germany are improving in quality, as the percentage of elaborate EISs has increased over time, while the percentage of superficial EISs has declined.

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Weston, J.	Consultants in the EIA process	1995	<i>Environmental Policy and Practice</i> 5 (3), pp. 131-134	Some consultants feel that EIA slows down the decision-making process, imposes additional costs on developers and is a means through which local planning authorities can make unreasonable demands on developers to provide detailed information on issues “which are not strictly relevant to the planning decision”. On the benefits side, about three quarters of the consultants surveyed felt that EIA had brought about at least some improvements in environmental protection, primarily through the incorporation of mitigation measures early in project design and the higher regard given to environmental issues. However, other consultants felt that the system is “often a sham with EISs full of platitudes” (cited in Glasson <i>et al.</i> , 2005, p. 234-235).
Woloszyn, W.	Environmental impact assessment in Poland	2000	In: Bellinger, E., <i>et al.</i> (eds.), <i>Environmental Assessment in Countries in Transition</i> . CEU Press, Budapest (p. 95-104)	Considers the Polish EIA system to be rather ineffective. “...EIA in Poland is focused on its role in environmental analysis and it has little opportunity to influence planning or project design and management.” (p. 102). However, improvements have been introduced in the amendment of the Environmental Protection Act (adopted by Parliament on 30 June 1997).
Woloszyn, W.	Evolution of environmental impact assessment in Poland: problems and prospects	2004	<i>Impact Assessment and Project Appraisal</i> 22 (2), pp. 109-119	This paper examines the evolution of the concept and legal framework for the EIA process in Poland and their potential influences on an effective EIA practice in the country. No specific reference to costs or benefits.
Wood, C.	Comparative Evaluation of EIA Systems	1999	In: Petts (ed., 1999), pp. 10-34	Compares 8 EIA systems (USA, California, UK, The Netherlands, Canada, Australia, Western Australia and New Zealand). Despite the differences in each of these systems, there appears to be virtual unanimity of view that the benefits of all 8 EIA systems outweigh their costs. Delay rather than cost is the main criticism in most EIA systems.

Author(s)	Title	Year	Publisher, journal, report no. etc.	Short description
Wood, C.	Environmental Impact Assessment: A Comparative Review	1995; 2 nd ed.: 2003	Pearson, Harlow (UK)	Chapter 18 is entitled: "Benefits and costs of EIA systems". It contains information on benefits and costs in the USA, UK, Netherlands, Canada, Australia, New Zealand and South Africa. Generally, the main direct benefits of EIA are related to modifications to the proposed project as a result of the EIA (e.g. change in project design or mitigation of negative environmental impacts). In addition, indirect benefits widely observed include increased awareness and knowledge. Costs are usually below 1% of total project costs (the percentage tends to decrease with the size of the project). The main cost, however, (not included in this figure) is the delay which EIA may sometimes cause. Nevertheless, in all countries concerned the majority of stakeholders appears to agree that the benefits of EIA outweigh its costs.
Wood, C., and C.E. Jones	The Effect of Environmental Assessment on UK Local Planning Authority Decisions	1997	<i>Urban Studies</i> 34, pp. 1237-1257.	Environmental assessment (EA) is intended to ensure that environmental considerations are properly weighed in the decisions made by local planning authorities (LPAs) on planning applications. This paper analyses whether, to what extent, and how, EA has influenced LPA decisions. Forty case studies were analyzed by examining relevant documentation and conducting interviews with participants in the EA process. EA appears to have had a gradual rather than a revolutionary effect on decision -making. Its main benefits have been the enhanced provision of environmental information and, to a lesser extent, assistance in setting conditions and in modifying proposals. However, these benefits are not occurring in all cases, and changes are needed if the expected advantages of EA (better integration of environmental considerations into project planning and decision-making) are to be fully realized in the UK.

<i>Author(s)</i>	<i>Title</i>	<i>Year</i>	<i>Publisher, journal, report no. etc.</i>	<i>Short description</i>
Wood, G.	EIA Scoping in England Wales: Practitioners Approaches, Perspectives and Constraints	2006	<i>Environmental Impact assessment Review</i> 26, pp. 221-241	Based on a survey of EIA practitioners this study provides a detailed empirical investigation and assessment of recent scoping activity in England and Wales, in the context of evolving European Union (EU) regulations. Conceptual and contextual issues associated with scoping are outlined prior to the presentation of key findings, including: approaches to scoping; time spent for scoping; the assessment of significance; characteristics and influence of consultation; and perceived constraints to scoping. The paper concludes with an overview of findings, possible explanatory factors, and recommendations for future practice.
Zetter, J.	Environmental Impact Assessment: Has it had an Impact?	1997	In: J. Holder (ed.), <i>The Impact of EC Environmental Law in the United Kingdom</i> . John Wiley and Sons, Chichester, pp. 257-266.	Refers to ‘unpublished research’, suggesting that the costs of EIA range from 0.1 to 0.5% of total development costs (acknowledging that these costs are difficult to disentangle from the total costs of the planning procedure). Concludes that “generally costs and longer timescales are unlikely to be significant”.

Appendix II. Additional information on selected countries

- A. BIO (2006): Cost and benefits of the implementation of the EIA directive in Spain
- B. BIO (2006): Cost and benefits of the implementation of the EIA directive in France
- C. Ecologic: Interview notes with researchers on EIA evaluation in Germany (Führ *et al.*, 2007)
- D. Extensive summary of Njål *et al.* (2005) on Norway
- E. Extensive summary of Obroučka *et al.* (2005) on the Czech Republic