European Commission

Service Contract 070307/2007/485399/G.1

FINANCIAL SECURITY IN ENVIRONMENTAL LIABILITY DIRECTIVE

FINAL REPORT

August 2008

In association with

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EXECUTIVE SUMMARY

 ■ Background
Environmental liability is the mechanism by which the cost of damaging the environment is transferred back to those who cause the damage. The key to the operation of environmental liability is the assignment of a charge for the caused environmental damage. The Environmental Liability Directive (ELD) provides the legal framework for introducing environmental liability and the polluter-pays principle in the European Union (EU) industrial operations. It was adopted by European Parliament and Council on 21 April 2004 and the deadline for its transposition in the Member States (MS) was 30 April 2007.

Article 14(2) of the ELD (2004/35/EC) requires the European Commission to report by April 2010 on the effectiveness of the ELD in terms of actual remediation for environmental damage, on the availability of insurance products covering ELD requirements and their costs and conditions, as well as other types of security for the activities covered by Annex III of the Directive. The Commission shall submit another report to the European Parliament and to the Council before 30 April 2014 which shall include any appropriate proposals for amendment. This study is part of the preparatory work for the Commission’s reports of 2010 (on the effectiveness of the ELD) and 2014 (with proposals for amendment based on MS reports).

 ■ Objectives and Methodology
This study presents the state of the art of insurance and financial security of environmental liability under the ELD including an analysis of gaps and limitations of the existing approaches. Furthermore, the study analyses the MS response to financial security ELD requirements and to identify market based instruments (MBI) that could serve as alternatives to insurance cover in the context of the ELD.

Stakeholder consultation was made through questionnaires in electronic format sent to MS and the insurance industry. A number of interviews were also conducted with a range of operators from different sectors and across Europe in order to get a better insight on the operators’ perspectives. Some insurance, re-insurance, brokers, and MS authorities were also interviewed. A desk study of existing relevant publications and internet sources was also carried out. Finally, a workshop was organised to discuss and analyse relevant information with key stakeholders and experts in the field of financial security.

 ■ Transposition of the ELD and financial security approaches
The transposition of the ELD is still ongoing in some MS throughout the EU after the deadline of 30 April 2007. As of September 2008, eighteen MS have transposed the Directive (most recently Denmark and Portugal, which published and notified the legislation in August and September 2008 respectively), and nine MS have not finalised the transposition yet, although in most cases government bills or similar draft
legislation have been or are being discussed and are expected to be adopted shortly (for example, in Austria, Ireland, and United Kingdom, a transposition is expected by the end of 2008). In the case of France, a Decree is still to be adopted for a complete transposition (expected by the end of 2008); and in Belgium, the central State, the Flemish and the Walloon regions have already transposed the ELD, while the region of Brussels is in the process of a second reading and the legislation should be adopted by the end of 2008.

In MS where the ELD Directive has already been transposed into national law or where a draft bill has been published, different choices were made concerning the scope, exemptions, and financial security choices.

Six MS (Bulgaria, Czech Republic, Hungary, Slovakia, Spain, and Romania) have introduced provisions on mandatory financial security. A compulsory financial security requirement is not necessarily restricted to insurance products, and for example, in Slovakia, Czech Republic, and Spain, operators will have the possibility to choose among different options (e.g. insurance, bank bonds, and assets deposits).

Article 8 of the ELD Directive proposes possible exemptions to MS in the transposition process (i.e. state of the art and permit exemptions). The Netherlands, Hungary, Poland, and Lithuania chose not to include any of these exemptions in the national legislation. In the case of Germany, the competence to introduce defences is left to the Federal States (Länder). Bulgaria and France decided not to allow any permit exemption but included the state of the art exemption in their legislation. Sweden applies mitigated liability (the permit defence and the state of the art exceptions are not implemented as defences but as mitigating factors).

Out of the eighteen MS that have transposed the ELD, seven (Cyprus, Czech Republic, Estonia, Hungary, Poland, Spain, and Sweden) decided to further extend the scope of the Directive (e.g. the scope has been extended to all species and habitats protected under national law).

Most MS have engaged discussions with insurance and banking sectors during the preparation work for the ELD transposition into national law and some have also undertaken an impact assessment (IA) prior to the transposition of the ELD into national law (six MS of the ten that have transposed the ELD and responded to the questionnaire).

- **Insurance and Re-Insurance Market in the EU**

In general, insurance is the most popular instrument to cover environmental liability, followed by bank guarantees (Austria, Belgium, Cyprus, Czech Republic, the Netherlands, Poland, Spain, and United Kingdom) and MBIs (Austria, Belgium, Bulgaria, Cyprus, Poland and Spain). Pools are present in some MS (France, Italy, and Spain).

A large part of the environmental liabilities under the ELD can be covered under EIL policies (offered on a stand-alone basis or combined with other products), or new, specialised stand-alone products developed by insurers and re-insurers. Extensions to GTPL policies can also cover environmental liabilities under the ELD, the extent of
application being subject to underwriting and additional premiums. So far, the preferred option to deal with environmental liability under the ELD is EIL and stand-alone insurance products. Yet, products offering cover for the full scope of the liabilities under the ELD are not generally available. Indeed, in most cases there are no insurance products for some risks where the economic consequences cannot be predicted, such, for example, in the case of damage by Genetically Modified Organisms (GMOs), and those for which existing experience is limited, such in the case of compensatory remediation with regard to damage to biodiversity.

While sudden and accidental pollution coverage is offered by most insurers, gradual pollution is only offered by a few. Some new products are currently being developed designed to respond as closely as possible to the ELD requirements, covering gradual pollution in addition to sudden and accidental pollution (such as the case of the ECOSPHERE product developed by AXA Corporate Solutions, or EnviroPro developed by AIG).

The reimbursement ceilings of different insurance products currently being offered by insurers range from less than €1 million up to a maximum coverage of €50 million (mainly specialist EIL insurers), depending on the risks that are covered and the premiums.

Given the fact that, the European insurance market is not currently in the position to cover all environmental liabilities under the ELD, alternative risk transfer (ART) arrangements, together with self-insurance, form an interesting alternative, yet not very known and applied in Europe.

Outside the EU, one of the most developed environmental liability insurance market is in the United States of America (USA). The current study analyses this market, its characteristics and drivers, and lessons that can be learnt from the American experience. The environmental financial security market in the USA differs from the European market in several ways. Some differences are, for example, that the environmental legislation applies unlimited retroactive liability, there are more financial security requirements in environmental legislation, the market is influenced by the joint and several approach taken by the authorities, the legislation is generally enforced to a larger degree than in the European MS, there are more extensive brownfield remediation programmes in place, and there is a greater public awareness of environmental insurance (different financial security instruments have been available for quite some time now, thus the market is more mature). Most of these factors have promoted a higher demand for financial security products as the result in higher economic risks for operators, i.e. there is a larger probability of being liable to pay. The environmental insurance market has created various types of environmental insurance products to address the needs of the insurance buyer, including for example the site-specific EIL or the Contractors Pollution Legal Liability (PLL) products. Some insurers have used their experience in USA to develop products adapted to the European liability requirements.
Operators’ perspective

The results from the operator interviews show that among the operators surveyed, none had actually adapted their insurance policies to cover the extended liability induced by ELD. Some of them were even not aware of the existence of the ELD or the specific national transposing law. Reasons for the lack of action include the fact that the ELD is still very new and also that operators had not been properly informed by their insurance provider about the need to take action or the availability of new products to face the extended environmental liability. This suggests that the transposition of ELD still needs to be communicated to the general public and to the major players in the field. Reaction from operators might not be observed until an important pollution event illustrating the potential exposures and the losses occur. In general, most operators are not proactive in managing their environmental liabilities and many companies, particularly Small and Medium Enterprises (SME), are leaving themselves exposed to environmental risks by failing to properly consider what risks are covered by their current policies.

The companies aware of their environmental liabilities tend to cover their risks mainly through a mix of environmental insurance (either EIL or other stand-alone insurance or extension of GTPL products) and other financial security instruments. Large companies usually have the assistance of a professional in-house risk manager and use the services of a global broker. Together with the insurer, these large companies can put together tailor-made solutions. This is not the case of SMEs, where the managing of environmental liabilities is usually outsourced.

High insurance premiums (for SMEs) as well as limited coverage of risks (for high risk companies) are the main reason for companies to look for other solutions. Different types of captives are very popular as well as self-insurance, the latter only in those cases where sufficient economic resources available to this end (mainly large companies).

Gaps and limitations

Main limitations (and therefore the barriers for the development of more far-reaching products) are resulting from a lack of data and risk assessment models (to estimate risk and assess damages) and experience in underwriting and claims management. As long as these limitations remain, the insurers will be reluctant to extend their coverage. Indeed, most products are usually tailor-made for specific sites which make them expensive due to time-consuming underwriting since there is yet lack of experience and general data. The lack of clarity at the national level and the long timeline in environmental damage cases were also quoted as barriers.

Another actor that hinders the stimulation of this supply by the insurance industry is the broker. Brokers are not always aware of the ELD and the new risks for their clients and in those cases where they are, they are more comfortable in selling standard products that they have worked with over a long period of time instead of new products that they are less familiar with.
In some MS, work is under progress in order to develop some kind of guidance either for operators or for insurers, for example, on how to estimate costs of environmental damages (e.g. Poland, Spain and France). Some information regarding the prevention and remediation of environmental damage is available at the European level especially in the context of the REMEDE project. To deal with the problem of data availability, some insurers are doing active loss monitoring and gathering data from claims. The European insurance and reinsurance federation (CEA) has recently started collecting cases which have occurred since April 30th in other Member States and that are publicly available.

### Market based instruments (MBI) in the context of ELD

If the insurance market is not going to develop sufficiently in order to ensure that the new responsibilities of polluters under the ELD are covered, then other instruments might become necessary in order to ensure the effectiveness of the ELD. Experience in recent years shows that the questions of ‘which instrument is best’ has changed to ‘which mix of instruments is best’. In general, threats of liability can encourage the development of other market instruments such as tradable permits, taxes or charges. MBIs can be more cost-effective for delivering environmental outcomes than many traditional methods.

The current experience in the application of MBIs in the context of environmental liability is very limited and most MBIs relevant in the context of ELD are mainly applicable for biodiversity or habitat compensation.

The most basic pre-condition for an effective MBI in relation to the ELD is that it is to be revenue generating in order to build up a fund out of which remediation measures can be paid. Permits, charges, and taxes can generate revenues whereas this is not the case with subsidies and incentives.

In the context of ELD, tailor-made charges seem to be one of the most feasible solutions. In particular, implement a charge linked to an operating permit to cover environmental liabilities could be a cost efficient solution as a large part of operators that fall under the Annex III already need an permit.

Another example for the use of MBI is habitat banking, a trading instrument first developed in the US (in this case, wetland banking) in the context of liability regimes. The ELD explicitly allows for this kind of complementary remediation for damage to water or protected species or natural habitats (remediation at a different location when the primary remediation does not result in fully restoring the damages natural resource and/or services).

### Future work

A clear and unambiguous legal framework is crucial for enhancing insurability. Future work will need to further update and analyse the progress in the implementation of ELD in the MS that have already transposed the ELD, and the transposition process in those MS that have not yet finalised the transposition by September 2008. Information on specific insurance products should be disseminated and efforts should be put in
promoting information sharing through the promotion and facilitation of dialogue between different stakeholders (e.g. operators, brokers, insurers, etc.). This could contribute to the development of new ELD insurance products and the identification of the most relevant alternatives solutions.

A compilation of recent events under ELD (case studies database) to illustrate how implementation works in practice and the performance of the available financial security products would be necessary. Also such database could be useful to establish best practices for the handling of claims. Information on claims and losses could also be gathered from recent pollution events under the ELD.

Some insurers, insurance associations, and MS (e.g. Spain and France) have already started to develop guidance on how to assess risks and estimate environmental damages. Nevertheless, further work in this regard is necessary as there is still very little knowledge about how some of the existing methodologies can work in practice in the framework of the ELD. Also, very limited information is available about current operator’s needs and attitudes towards the ELD and their expectations from financial security providers.

**Conclusions**

The transposition of the ELD is still ongoing in some MS throughout the EU after the deadline of 30 April 2007. The ELD does not currently require operators to cover their activities by a financial security instrument, but looking at the liability conditions imposed by the ELD, operators aware of these risks are expected to cover themselves. In this context, different financial security products have started to emerge. To date, the EIL and some new specialised stand-alone products offer a more appropriate cover for the liabilities introduced by the ELD. Nevertheless, environmental liability insurance schemes, particularly on site specific and stand-alone basis, represent still a niche market with only a relatively small number of insurers offering financial protection. Moreover, in general most available products still not cover the full range of liabilities under the ELD. It remains difficult for insurance companies to develop ELD specific products due to the lack of data on remediation costs, risk assessment models and experience in underwriting and claims management.

The use of alternative products to insurance (e.g. ART) or the application of MBIs is still very limited in Europe. Operators, particularly SMEs, seem generally not aware of the environmental liabilities introduced by the ELD and their exposures, and most have not adapted their insurance policies to cover the extended liability.
ABBREVIATIONS

ABI Association of British Insurers
ART Alternative Risk Transfer
CAP Common Agricultural Policy
BER Block Exemption Regulation
CEA European insurance and reinsurance federation
CGL Commercial General Liability (Insurance)
CPL Contractors Pollution Legal Liability
EASO Environmental Assessment of Sites and Organisations
EII Environmental Impairment Insurance
EIL Environmental Impairment Liability
ELD Environmental Liability Directive
GDV German Insurance Association
GLP General Liability Policy
GTPL General Third Party Liability
IA Impact Assessment
IMRI International Risk Management Institute
INERIS Institut National de l’Environnement Industriel et des Risques
IRS Internal Revenue Service
LSP Licensed Site Professionals
MBI Market Based Instruments
MMP Multi-year/Multi-line products
MTP Multi-Trigger Products
MCP Massachusetts Contingency Plan
MS Member States of the European Union
NA National Associations
OPA Oil Pollution Act (US)
OSWER Solid Waste and Emergency Response (US)
PES Payments for Ecosystem Services
<table>
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<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>PLL</td>
<td>Pollution Legal Liability</td>
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<td>PPL</td>
<td>Premises Pollution Liability</td>
</tr>
<tr>
<td>RSA</td>
<td>Royal &amp; Sun Alliance Plc</td>
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<td>SPA</td>
<td>Special Protection Area</td>
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<tr>
<td>SSSI</td>
<td>Sites of Special Scientific Interest</td>
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<tr>
<td>UK EA</td>
<td>United Kingdom Environment Agency</td>
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<tr>
<td>US EPA</td>
<td>United States Environmental Protection Agency</td>
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<tr>
<td>USCG</td>
<td>US Coast Guard</td>
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<td>UST</td>
<td>Underground Storage Tank</td>
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1. INTRODUCTION

1.1. REPORT STRUCTURE

This document is the final report of the study “Financial Security in the Environmental Liability Directive (ELD)” commissioned by DG Environment under Service Contract 070307/2007/485399/G.1. The main objective of this study is to present an analysis of issues related to financial security of environmental liability under the ELD and serve as a background document for the preparatory work being carried out by the Commission for the 2010 and 2014 reports. It is based on a literature review, stakeholder consultation through questionnaires and interviews, and a workshop on “Financial Security in ELD”, which took place in Brussels on Friday 27 June 2008 in the context of this study.

Chapter 1, current chapter of this report, describes the financial security provisions in the Environmental Liability Directive (ELD), in particular its historical background and changing approaches during recent years with regard to financial security.

Chapter 2 introduces the scope of the current study, specifying its main goals, and the adopted approach and methodology.

Chapters 3 to 7 present the main results regarding the state of insurance and financial security for environmental liability under the ELD and a comparison of existing approaches and financial security options offered in the market.

In particular, chapter 3 focuses on the different approaches adopted by Member states (MS) to tackle financial security in ELD and the existing gaps. Chapter 4 presents an inventory of existing insurance and re-insurance schemes and addresses the methods and approaches for designing ELD insurance products. Chapter 5 discusses the level of awareness among operators about legal environmental obligations and liabilities in case of pollution and how their associated financial risks are covered. Based on the previous chapters, chapter 6 presents existing main gaps and limitations of the existing financial instruments to cover environmental liability, particularly insurance products.

Chapter 7 describes alternative policy instruments and their applicability in the private sectors and by MS. Chapter 8 presents the main conclusions and also recommendations for future work in the framework of the Commission reporting exercises and on how to overcome identified gaps.

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1 The ELD requires the European Commission to report by 2010 on the effectiveness of the ELD and to send a report by 2014 to the European Parliament with proposals for amendments based on MS reports.
1.2. THE CONCEPT OF ENVIRONMENTAL LIABILITY

Environmental liability is the term used for the process through which responsibility for the cost of damaging the environment is transferred back to those who cause the damage. The key to the operation of environmental liability is the assignment of a charge for the caused environmental damage. The Directive 2004/35/EC on environmental liability with regard to the prevention and remedying of environmental damage (hereafter ELD) provides a legal framework for introducing environmental liability and polluter-pays principle in the EU industrial operations. It was adopted by European Parliament and Council on 21 April 2004 and the deadline for its transposition in the MS was 30 April 2007, though not all MS have transposed it yet in their national legislation.

1.3. BACKGROUND

The “polluters pay principle” advocates that the polluters should be charged for the costs of cleaning up pollution, for the economic cost that pollution causes to others’ property, and for the purchase of consents to discharge pollution. Environment being a ‘public good’, it is not priced in a conventional market and as a result there remains ambiguity regarding the responsibility for its damage. Also, the charges for rectifying environmental damage may sometimes not adequately reflect its true environmental cost. By introducing the concept of environmental liability, the polluter is henceforth held responsible for the caused environmental damage.

Early discussions on environmental liability issues (started thirty years ago) focussed on waste discharges. Different provisions for civil liability for environmental damage caused by wastes were proposed but never adopted (e.g. proposed Directive on toxic and dangerous waste in 1976, with provision for strict liability for personal injury from such waste related damage, and the proposed Directive on transfrontier shipment of hazardous waste in 1983, with provision for strict liability for damage caused by waste). Initiatives on environmental liability were also driven by ecological disasters such as the pollution of the Rhine River in 1986. In response to this accident, the Council and the Parliament issued a resolution requesting the Commission to propose a regulation imposing civil liability for environmental damage to Rhine and other main transportation routes in the EU (Fogleman, 2008 a).

In 1987, the Commission published a study showing that few MS had legislation imposing civil liability for environmental damage. This led to the green paper on civil liability for remedying environmental damage and the Commission also continued its previous work on the proposed Directive on civil liability for waste. In 1989, financial security provisions were proposed to cover liability costs for bodily injury, property damage, and clean-up in a proposed Directive on civil liability for damage caused by waste, however, this proposed Directive was abandoned in 1991. A provision to cover
the liability for property damage from waste was also made in the proposed Directive on landfill of waste but this provision was also abandoned in 1996.

In 1993, the Commission issued the Green Paper on remedying environmental damage, which included various concepts of liability for environmental damage including past pollution incidents, the adequacy of remedial measures, and financial security for activities/companies likely to damage environment. In 1994, the Parliament issued a resolution requesting Commission to submit a proposal of Directive on civil liability for future environmental damage. The Commission discussed if to accede to the Lugano Convention (or base the Directive on it) and finally decided to issue a White Paper in 2000, and suggested that most appropriate option was a Directive providing “strict liability for damage caused by EC regulated activities, covering both traditional (bodily injury and property damage) and environmental (remediation) damage, and fault-based liability for damage to biodiversity caused by non-dangerous activities”. The White Paper did not recommend a requirement for financial security, but advised discussions with insurers and bankers to stimulate financial guarantee instruments.

The approaches to cover environmental liability via financial security have evolved over the last few decades. For example, the approach changed from a civil liability regime to a public law regime (as currently adopted in the ELD). Another important aspect is the nature of financial security, i.e. mandatory or voluntary. A discussion between the Parliament and the Council contributed to the introduction of the requirement to submit a report by 2010 in the ELD which would analyse the availability at reasonable costs and on conditions of insurance and other types of financial security and the possibility of a gradual approach. The approach adopted for financial security in the ELD of allowing operators to choose the mechanism that best suits their needs and to phase in the requirement is a plausible approach.

### 1.4. THE ENVIRONMENTAL LIABILITY DIRECTIVE

The ELD covers:

- Protected species and natural habitats (protected by the 1979 Wild Birds Directive and 1992 Habitats Directive) at over 22,000 individual sites that form the Nature 2000 network covering nearly 17 percent of the land area of the 25 EU states as well as 140,000 km$^2$ of marine area
- Water (covered by Community Water legislation)
- Direct or indirect contamination of land

As illustrated in Figure 1, the ELD differentiates between two types of liability regimes: strict and fault based. Strict liability applies in respect to environmental damage or the imminent threat of such damage caused by the operation of activities listed in Annex III to the Directive (i.e. IPPC and waste activities subject to permit or registration), i.e. activities which are considered potentially damaging to the environment and regulated by Community legislation. “Strict liability” means that it is sufficient that there is a...
causal link between the occupational activity and the environmental damage and no fault or negligence on behalf of the operator of the occupational activity is necessary to trigger liability. Strict liability covers all forms of environmental damage, e.g. damage to water resources and land, as well as damage to protected species and natural habitats covered by the Birds and Habitats Directives. Fault-based liability, on the other hand, means that the operator of the occupational activity, through a deliberate action or omission, or negligence, has caused the environmental damage. It applies to the damage to protected species and natural habitats from all other occupational activities but not to water and land damage. Please see Appendix 1 for various definitions related to the ELD.

**Figure 1 - Liability regimes in the ELD (Source: Swiss Re, 2007)**

When an operator is considered liable, he is responsible for preventing environmental damage or to prescribe remediation measures in case the damage has already occurred. Regarding remediation measures, the ELD differentiates between primary remediation, i.e. the remediation necessary to restore the baseline condition of the affected site; complementary remediation, i.e. the creation of an alternative site in cases where primary remediation is not possible; and finally compensatory remediation, i.e. the provision of financial compensation for any interim loss suffered by the general public (e.g. loss of amenity, biodiversity services). Importantly, no monetary limit of liability has been set for the costs of the remediation measures.

The scope of the ELD, however, is limited by the following exemptions:

- It only applies to damage arising from events/ emissions occurring after 30 April 2007.
- It does not apply to activities covered by some international conventions (e.g. the International Convention on Oil Pollution Damage).
- It does not apply in case of damage or imminent damage resulting from armed conflict, natural disaster, national defence, etc.
- An operator is not liable to bear the costs when the damage is caused by a third party, provided that appropriate safety measures were in place.
- An operator is not liable to bear the costs if the damage results from compliance with an order or instruction from a public authority.
• MS have the discretion to exempt an operator from bearing the costs if the damage results from an authorised activity (permit exemption) or the emission or activity was not considered likely to cause environmental damage according to the state of scientific and technical knowledge at the time (state of the art exemption).

• It does not apply in case of diffused pollution where it is impossible to link the negative environmental effects with acts or failure to act of certain individual actors.

The Directive leaves a large degree of flexibility to the MS in transposition and thus implementation of the ELD. A number of MS have already made use of this flexibility in their national transposition. Besides the possibility of not to acknowledge permit and state of the art exemptions, the MS can also decide whether or not liability should be joint and several, or proportional. Furthermore, MS also have the possibility to go beyond the Directive, for example, by introducing obligatory financial security and applying a reversal of the burden of proof. Consequently, the implementation of the Directive may follow different models according to the choices made by MS while transposing the Directive.

1.5. FINANCIAL SECURITY IN THE EU LEGISLATION

Financial security provisions are contained various EU legislations such as:

• Council Regulation 259/93/EEC on the supervision and control of shipments of waste within, into and out of the European Community
• Directive 2002/96/EC on waste electrical and electronic equipment
• Directive 2006/21/EC on the management of waste from extractive industries

Currently, the ELD does not require operators to cover their activities by a financial security (e.g. insurance). However, looking at the liability conditions imposed by the ELD and their financial implications, which can be very large depending on the damage caused, operators aware of these risks are expected to cover themselves. Financial security can be considered as one of the cornerstones for the implementation of the ELD.

Even though experience shows that operators are often aware of their new responsibilities, insurance markets can be expected to react to these new market opportunities and provide adequate solutions. It can furthermore be anticipated that there will be some kind of intervention from public authorities to promote financial security instruments as MS have the obligation to encourage the development of environmental insurance products or other forms of financial security adapted to the terms of the Directive and also because the insurance market might not develop a sufficient range of products that cover all ELD responsibilities. Another reason for MS
to encourage such measures is to reduce the state’s liability because in the case a company goes bankrupt, the responsibility to remediate may fall upon the State.

1.6. PREPARATORY WORK FOR THE COMMISSION’S REPORTING

As per Article 14 (2) of the Directive, the European Commission is obliged to present a report on the effectiveness of the ELD by 30 April 2010, on the availability of financial security at reasonable costs, and on conditions of insurance and other types of financial security for the activities covered by Annex III. The report shall also consider in relation to financial security the following aspects: a gradual approach, a ceiling for the financial guarantee, and the exclusion of low-risk activities. In the light of this report and of an extended impact assessment (IA), including a cost-benefit analysis, the Commission may, if appropriate, submit a proposal for a system of harmonised mandatory financial security.

Furthermore, according to article 18 MS shall report to the Commission on the experience gained in the application of this Directive by 30 April 2013 at the latest. Based on MS reports, the Commission shall submit a report to the European Parliament and to the Council before 30 April 2014, which may include any appropriate proposals for amendment.

In order to meet the reporting requirements established in the ELD (reports due by 2010 and 2014), the Commission has already initiated information collection for discussions with relevant stakeholders. Main sources for the 2010 report will be MS and stakeholder consultation during 2008/2009 and studies conducted on these issues. More specifically, the preparatory work will consist of:

- Close monitoring of the state of play with regard to transposition of the ELD and in particular the provisions under Article 14
- Discussion/updates on progress made with the MS in the Liability Expert Group by means of regular annual or bi-annual meetings and a CIRCA interest group
- Discussions and co-operation with the insurance companies on how the market developments
- Current study on financial security in ELD and future studies on related issues.

For the 2014 report on application of ELD, the main source will be MS reports, which are due by 2013.
2. OBJECTIVES, SCOPE, AND METHODOLOGY

2.1. OBJECTIVES

This study presents the state of the art of insurance and financial security to cover environmental liability under the ELD, including an analysis of gaps and limitations of existing approaches. Furthermore, the study analyses MS responses to financial security requirements of ELD and to identify other market based instruments (MBI) that could serve as alternatives to insurance.

2.2. SCOPE

This study examines existing financial security solutions along with the future developments in this direction. Further, different issues are analysed from the perspectives of MS authorities, insurers, and operators. The study also reviews similar work in other countries, in particular the USA, where environmental liability insurance schemes have existed for many years. In brief, this study attempts to answer the following key questions:

- What are the existing financial security solutions which could be most relevant to cover the ELD related risks?
- What is the current status of transposition in different MS and what kind of differences observed in the national legislation compared to the ELD?
- How the insurance market is reacting at the EU level and in the MS with the advancement of the ELD transposition process?
- What are the emerging insurance products inspired by the ELD and a comparison with similar products outside EU? What are their limitations and existing gaps?
- Which MBIs are appropriate in the context of ELD and how can they complement or substitute an insurance product?
- What is the status of awareness (and use) of financial security products among operators to cover the ELD related risks?

2.3. APPROACH AND METHODOLOGY

The general approach of this study was to analyse the problem at a macro level and to illustrate the critical issues with the help of case studies. Extensive stakeholder consultation was made to cover the range of issues highlighted above.
The main tasks of this study consisted of collecting the information from different stakeholders through questionnaires and interviews and discussing the outcomes of the analysis with the stakeholders. Information was also gathered from the existing literature. Finally, the information from various sources and stakeholder consultation was collated, assessed and discussed with key stakeholders and experts in the field of financial security during a workshop.

Following sections present the key steps in the process and the approach and methodology adopted for each step.

2.3.1. **DESK STUDY**

In order to take into consideration the existing research on the subject, a desk study of existing relevant publications and internet sources was performed. The main objective was to identify information on the current situation regarding ELD-relevant insurance products, market development, alternative solutions, and approaches adopted by different MS on financial security under the ELD, and operators’ approach to cover these risks.

2.3.2. **STAKEHOLDER CONSULTATION**

The information collected through the literature review was further completed and updated via the stakeholder consultation, targeting MS, insurance industry, and operators. MS and insurance industry were contacted by using targeted questionnaires, while operators were consulted through individual interviews.

- **Questionnaires**

Basing an analysis of current environmental liability products and their potential on a literature review will not reflect recent and ongoing developments. Therefore, two specific questionnaires were developed and used to gather information on financial security in the ELD from MS and the industry (insurers and reinsurers).

This questionnaire for the MS aimed at gathering up-to-date information on the transposition status of the ELD as well as more in-depth information on the way environmental liability is currently covered in different MS, recent market developments, gaps and shortcomings of current insurance products, etc. In total, fifteen MS replied to this questionnaire (Austria, Belgium, Bulgaria, Cyprus, Czech Republic, France, Germany, Hungary, Ireland, Netherlands, Poland, Slovakia, Spain, Sweden, and United Kingdom).

The questionnaire for the insurance industry aimed to get a wider picture of the industry’s view of current and future market development, main problems encountered in the development of environmental insurance products, and an overview of existing (and future potential) gaps and reasons behind those gaps. The industry questionnaire was sent to 110 recipients including 23 national insurance associations (NA) of the European insurance and reinsurance federation (CEA) and 87 insurers and re-insurers across Europe. In total, twenty two responses were received.
The NA did not answer directly to the questionnaire but some of their member insurance companies sent the responses.

**Interviews**

Given the wide range of sectors and the large number of companies in the EU, a questionnaire for operators was not feasible within the scope of this study. Instead, a number of telephonic interviews were conducted with a range of operators. The main focus of the selection criteria was to get a good coverage of different sectors and MS (including new MS), and also a balance between large companies and SMEs. In total, 10 interviews were conducted with different operators. Please note that the specific names of the companies are not provided due to confidentiality reasons. Some insurers, re-insurers, brokers, and MS authorities were also interviewed.

### 2.3.3. INFORMATION PROCESSING

An assessment of responses of the questionnaires and interviews was made and results are presented per MS and for the different type of stakeholder. Based on the collected information, a comparison was also made regarding the variation in the financial security provisions in the transposition of the ELD across different MS.

Furthermore, a comparative analysis of different financial security products was performed, taking into consideration the possible alternatives to liability insurance, and identifying their respective advantages and disadvantages. In particular, the study looks at the efficiency of the existing insurance products and how far they provide operators sufficient cover for their environmental liabilities, the applicability of alternative instruments, and scope for further market development. Case studies are used to further illustrate the analysis and a comparison is made with the practices in across Europe and USA.

### 2.3.4. VERIFICATION WORKSHOP

The preliminary results of the information gathering exercise were presented in a workshop held on 27 June 2008 in Brussels. The main objective of this workshop was to discuss and analyse relevant information with key stakeholders and experts. During the workshop, main discussed issues were the historical background of ELD and its financial security provisions, similar issues in the US context, current status of the ELD transposition in MS, insurance industry’s vision, and operators’ perspective. Furthermore, a MS panel of representatives from Belgium, Spain and the United Kingdom discussed issues related to transposition and implementation of the ELD. Other MS also joined the discussion by presenting the current situation regarding transposition of the ELD and the measures that are being implemented or under consideration for encouraging the development of financial security instruments and markets.

The workshop support material (e.g. presentations, list of participants, etc.) was made available through a dedicated website.
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3. ELD TRANSPOSITION IN MEMBER STATES

The ELD was required to be transposed by all MS by 30 April 2007. As of September 2008, nine MS have not finalised the transposition yet, although in most cases legislation drafts have been or are being discussed and are pending adoption. The ELD leaves MS the possibility to exceed the minimum requirements in the Directive in their transposition. According to the Article 14 of the ELD, ‘MS shall take measures to encourage the development of financial security instruments and markets’. Furthermore, the MS public authorities are at the heart of the functioning of the ELD as it is their role to identify the operator(s) causing the damage, to assess the significance of the damage, and to determine which remedial measures should be taken.

3.1. CURRENT STATUS

The results presented in this section are to a large extent based on the responses to the questionnaire sent to the MS in order to assess the current level of transposition of the ELD and the choices made by national authorities during the transposition process, as well as on specific interviews and exchanges with certain MS. As indicated earlier, fifteen replies were received out of the twenty seven questionnaires sent (Austria, Belgium, Bulgaria, Cyprus, Czech Republic, France, Germany, Hungary, Ireland, the Netherlands, Poland, Slovakia, Spain, Sweden, and United Kingdom).

The transposition of the ELD is still ongoing in some MS, even after the expiry of the deadline of 30 April 2007. As of September 2008, eighteen MS have transposed the Directive (most recently Denmark and Portugal that published and notified the legislation in August and September 2008 respectively), and nine MS have still not transposed it, although in most cases government bills or similar draft legislation have been discussed and are to be adopted shortly (for example, in Austria, Ireland, and United Kingdom, a transposition is expected by the end of 2008). In the case of France, a Decree is still to be adopted for a complete transposition (expected by the end of 2008); and in Belgium, the central State, the Flemish and the Walloon regions have already transposed the ELD, while the region of Brussels is in the process of a second reading and the legislation should be adopted by the end of 2008.

Infringement procedures for non-communication of transposition had been issued for 9 MS (Court application) as on 25 June 2008. A conformity assessment will probably be launched shortly and if necessary, the Commission will follow-up through non-conformity procedure, probably starting in 2009).
Preparatory work for the ELD transposition

In order to better identify potential limitations of the proposals and possible solutions, most MS carried out preparatory studies prior to the drafting and adoption of the national legislations transposing the ELD. Six MS that have transposed the ELD and responded to the questionnaire stated having undertaken an Impact Assessment (IA) prior to the transposition of the ELD into national law (Bulgaria, Czech Republic, Germany, Hungary, Poland, and Spain). Ireland and the United Kingdom, which are planning to fully transpose the directive shortly, also responded to have undertaken IA during different phases of the development of the draft legislation. Some MS provided more details about such preparatory work, as summarised hereafter.

- In Czech Republic, the IA was carried out at a very general level, describing possible impacts of the law on different stakeholders. Regarding financial security options, mainly insurance, bank guarantees, and polluters’ financial reserves were discussed.

- In Germany, an IA concerning the price effects was undertaken but no alternatives for financial security were discussed.

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2 Based on questionnaire responses, CEA (2008) and Commission’s information.
• In Poland, first the approach to calculate primary, complementary, and compensatory remediation was analysed and then the options for assessing the value of the damage to protected species and natural habitats were examined.

• In Spain, an economic assessment of the proposed law was undertaken by the Department of Economy of University of Alcalá de Henares (Madrid, Spain). The study focused both on the situation of the insurance market and the implications of a possible mandatory financial security scheme (see also section 3.2.1).

• In the United Kingdom, an IA was undertaken during the development of the Directive. Different aspects were examined including the likely frequency of cases in which operators would not be able to cover their liabilities through their own assets on the basis of records of environmental damage, likely costs of liability, and types of businesses causing damage and their ability to afford the costs. Various options for mandatory financial security (e.g. mandatory insurance, allowing choosing from different financial security instruments, etc.) were also assessed and it was concluded in each case that the costs were disproportionately higher that the benefits of requiring an insurance cover.

3.2. MS APPROACHES FOR FINANCIAL SECURITY IN THE ELD

In MS where the ELD has already been fully transposed into national law or where a draft bill has been published, different choices have been made concerning the scope, exemptions, and financial security solutions compared to those proposed in the Directive. Specific approaches adopted by some MS relevant to financial security are described below.

3.2.1. COMPULSORY FINANCIAL SECURITY

Article 14 of the Directive states that national regulations should encourage the development of financial security instruments or equivalent appropriate measures to enable operators to use guarantees to cover their new environmental liability. Some MS have taken fundamentally different approaches to tackle financial security, in particular to the question whether to make financial security compulsory for operators, i.e. the requirement that all operators facing environmental liability must subscribe to an insurance policy or some other form of financial security to cover their environmental risks.

Poland issued a list of activities for which public authorities can demand financial guarantees when issuing permission. In Italy, only certain industries have an obligation to purchase insurance (i.e. nuclear activity, transportation, storage of hazardous materials and distribution of gas) (CEA, 2008a).

Six MS (Bulgaria, Czech Republic, Hungary, Slovakia, Spain, and Romania) have introduced provisions on mandatory financial security. One of the main reasons for
introducing this mandatory scheme is the amount of public money that is annually spent in the restoration of “orphaned” polluted sites and in the case of insolvency of the polluter to face the restoration costs. Five of these MS (Bulgaria, Hungary, Czech Republic, Slovakia, and Spain) foresee introducing this measure at a future date as shown in Figure 3:

- In Bulgaria, compulsory insurance would be introduced by January 2011.
- In Czech Republic, obligation to financial security has been postponed under the Financial Security Act and it will be compulsory from 1 January 2013 but the Act sets some exceptions:
  - in the case when the possible cost of remediation (to be estimated through a risk analysis) is less than 20 million CZK.
  - even if the remediation costs are beyond above mentioned threshold but if the company is certified in accordance with EMAS (Regulation 761/2001/EC).
- In Hungary, no date has been established to introduce compulsory financial security, but a 3 year grace period is foreseen once a decision in made on this issue.
- In Slovakia, mandatory financial guarantees would be introduced by July 2012.
- In Spain, financial guarantees will be compulsory by April 2010, with three options for operators: insurance, bank bonds, and assets deposits (see Box 1).

A compulsory financial security requirement is not necessary restricted only to insurance products, for example, in Slovakia, Czech Republic and Spain, the operators will have the possibility to choose among different mechanisms to cover their risks.

Figure 3 - Timeline of compulsory financial security in some MS

<table>
<thead>
<tr>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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<tbody>
<tr>
<td>Spain</td>
<td>Bulgaria</td>
<td>Slovakia</td>
<td>Czech Republic</td>
</tr>
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One potential drawback of introducing a mandatory financial scheme is that it could have a negative influence on the motivation of certain operators to manage their risks. Furthermore, in a relatively not so mature insurance market, and with a limited number of insurers and brokers, it could result in high premiums. In the case of monopolistic premiums, insurers could have fewer incentives to align his premiums to the individual behaviour of the insured.
Box 1 - Mandatory Financial Guarantees in Spain

The ELD is transposed in the Spanish legislation through the Law 26/2007, which besides covering species and habitats in Natura 2000, soil and water, also includes habitats and species not listed in EU annexes designated by the Spanish authorities for equivalent purposes and the coastline. This law requires mandatory financial guarantees (Chapter IV of the Spanish law transposing the ELD) for operators included in Annex III to cover their environmental liabilities. The mandatory scheme approach was very controversial in the beginning and it was necessary to establish an open dialogue with the insurance industry and also with other ministries.

The possible options for introducing such financial guarantee are:

- Ad hoc reserve, set up by the operator funds invested in public debt
- Bank bonds
- Insurance + ad-hoc fund, (the latter to be managed by the Autonomous Communities, still to be regulated)

This mandatory scheme is to be introduced by a Ministerial order to be published by April 30th 2010, which will establish a grace period for the introduction of such scheme (Spanish Government, 2007) when defining this guideline. The Ministry will take into consideration the level of maturity of the insurance market and will be based on a study to be carried out in 2009 in this regard.

The guarantee will be established in each case by the competent authorities taking into account the potential intensity and extension of the possible damage that could be caused by the operator, following the methodology established by the decree developing the law (see Box 8). Therefore, the competent authority shall justify the amount of the guarantee that is determined for each operator.

There is a defined range for the guarantee value, from €300,000 to €20 million, depending on the “potential damage”. The upper limit was established on the basis of a study carried out by the Department of Economics of the University of Alcalá, which analysed the implications of a possible mandatory financial security scheme.

There are some exceptions for operators whose activity could potentially generate damages below €300,000, between €300,000 and €2 million if the operators are certified with an environmental management system scheme (such as EMAS, ISO 14001) and operators using certain biocides and phytoproducts mentioned in the Annex II of the Law 26/2007. Once the financial guarantees are mandatory, these are not required to retroactively cover the operator from the date the Spanish transposition came into force but from the date of application of the permit or authorisation for such an activity. The operator would have to keep a valid guarantee during the entire duration of the activity.

The law requires the competent authorities to establish a system to control the validity of guarantees and insurers, financial organisations and operators to provide the competent authority with the information that it might request in this regard (art. 31.1).
In line with this argument, France informed that compulsory insurance would not make sense for an emerging risk market and it could lead to an increase of insurance premiums and hinder market development (Letrémy, 2008). The German Insurance Association (GVD) and the Swiss Reinsurance Company share the same opinion. The introduction of a mandatory harmonised financial security scheme at the EU level was also discussed during the workshop and some attendees expressed the opinion of not being in favour of a mandatory insurance, and argued that such scheme could even hinder the further development of appropriate insurance products.

In practice, most insurers in Europe are not enthusiastic about the introduction of compulsory financial security schemes due to potential costly claims and the lack of experience in estimating potential damages. A further problem is that today liability insurance coverage for environmental risks is still a relatively young field with very few case studies available.

For example, according to Swiss Re (Tettamanti, 2008 a) the implementation of a mandatory scheme for financial security would only be possible if:

- An established insurance market dealing with environmental risk existed for many years with an abundance of financial insurance capacity to ensure competition and freedom of choice.
- The risks considered formed a homogenous group where claims cost and frequency would be predictable with a degree of reliability.
- Sufficient capitals were invested due to a realistic expectation of a consistent delivery of profit targets.
- Direct insurance was supported by substantial amounts of re-insurance.

On the other hand, it is important to highlight that the introduction of a mandatory scheme is not necessarily restricted to insurance products and does not translate into an obligation for insurers to insure.

As commented earlier, if appropriate, and on the basis of the 2010 report and an extended IA including a cost-benefit analysis, the Commission may submit proposals for a system of harmonised mandatory financial security. In particular, the assessment would be based on the experiences reported by the MS that have already included provisions for a mandatory financial security. As many MS have opted for a gradual implementation and postponed the introduction of a mandatory scheme (at least until 2010), information on its implementation may not be available until 2010.

3.2.2. STATE OF THE ART AND PERMIT EXEMPTIONS

Article 8 of the ELD Directive proposes possible exemptions in the transposition process regarding environmental damage caused by activities that had been expressly authorised or were not considered as hazardous according to the state of scientific and technical knowledge. These exemptions clauses have not been adopted by all MS in their transposition of ELD:
• The Netherlands, Hungary, Poland, and Lithuania (CEA, 2008 a) chose not to include any of these exemptions in the national legislation.

• In the case of Germany, the Federal Act\(^3\) allows the Federal States (Länder) to provide for these defences; however, none of the Länder has implemented these defences yet.

• Bulgaria and France decided not to introduce the permit exemption but included the state of the art exemption in their national legislation.

• Sweden has opted for a “mitigating” approach, i.e. the permit and the state of the art exceptions are not implemented as defences but as mitigating factors.

3.2.3. **SCOPE AND EXTENSIONS**

The Directive restricts the notion of environmental damage to significant damage to EU-protected species\(^4\) and natural habitats\(^5\), water falling within the scope of the Water Framework Directive\(^6\), and land contamination which threatens human health.

Nevertheless, ten MS decided or are planning to further extend the scope of the Directive:

• In Cyprus, the scope has been extended to areas protected through the town planning zones and to nationally protected habitats and species.

• In Estonia, Hungary, Poland, and Sweden, the scope has been extended to all species and habitats protected under national law (CEA, 2008 a).

• Spanish law also includes any habitat or species not listed in EU annexes designated by Spanish authorities for equivalent purposes as those laid down in the Directives 92/43/EC and 79/409/EC.

• In England and Wales, it is planned to extend the liability to cover damage to species and habitats which are listed on the governing documents of nationally designated sites, i.e. Sites of Special Scientific Interest (SSSIs), where the damage occurs within a site. Over 70% of the area of SSSIs is also designated as Natura 2000 sites.

• In Austria, the scope may be extended to habitat or species designated by the Austrian federal states.


\(^4\) Species mentioned in Article 4(2) of Directive 79/409/EEC (on the conservation of wild birds) or listed in Annex I or listed in Annexes II and IV to Directive 92/43/EEC (on the conservation of natural habitats and of wild fauna and flora).


• In Czech Republic, an additional decree on the protection of some national protected species is expected (CEA, 2008a).

• In France, it is stipulated that the protected species and habitats will be further elaborated in a list to be developed by the Ministry of the Environment (CEA, 2008a).

3.2.4. OTHER SPECIFIC ISSUES

In Germany, although the ELD came into force after the 30th April 2007 deadline, the transposed national legislation is retroactive and applicable on all environmental damages that have occurred since April 30th 2007.

In Sweden, joint and several liabilities apply. The relevant occupational activities are not limited to the activities listed in Annex III, but forestry, fishery and agriculture are excluded as long as they do not fall under Annex III or are fault-based.

3.3. INSTRUMENTS TO COVER ENVIRONMENTAL LIABILITY

Coverage for ELD already exists in some MS through different type of financial security instruments (as illustrated in Figure 4). Insurance is the most popular instrument, followed by bank guarantees. The current uptake of the different possible instruments and their field of application are further discussed here.

Insurance and re-insurance

Insurance is indeed the most common instrument to cover environmental liability in many MS (Austria, Belgium, Czech Republic, France, Hungary, the Netherlands, Poland, Slovakia, Spain, Sweden, and United Kingdom). See chapter 4 for more detailed information on the insurance products currently available and the development of the market.

Table 2 summarises the some providers of environmental insurance policies in different MS (as responded in the survey).
Bank guarantees

Eight MS responded that bank guarantees are present in their market (Austria, Belgium, Cyprus, Czech Republic, the Netherlands, Poland, Spain, and the United Kingdom). Hungary foresees the use of bank guarantees and bonds to complement the existing limited number of commercial insurance products.

In the Netherlands, on the basis of the Decree on Financial Security (*Besluit financiële zekerheid milieubeheer*), competent authorities may require in the issued permits they issue to provide financial security to cover compliance with its obligations regarding waste management and storage after termination of the operator’s activities. To meet these requirements, financial security is usually provided in the form of a bank guarantee. Nevertheless, some companies are not in favour of this financial instrument as they argue that bank guarantees severely limit their investment capacity and most banks are not very keen to cover long terms risks. Partially on the basis of this argument, on the 8th of March 2008 the Second Chamber of the Parliament adopted a resolution to abolish the Decree on Financial Security, even if the government had proposed to maintain the Decree.

In Spain, bank guarantees play a minor role and are mainly used in the case of mining or similar activities where the damage is going to take place due to the nature of the activity. In the United Kingdom, there is some experience of bank guarantees through the requirements on landfill operators. In Czech Republic, bank guarantees are used in the field of shipments of waste (1013/2006/EC Regulation).

Financial guarantees

Financial guarantees are not very common and are present in only four MS out of the 15 that responded to the questionnaire, i.e. Austria, Belgium, Spain, and United Kingdom. In the United Kingdom, as for bank guarantees, there is some experience on financial guarantees as a requirement for landfill operators.
Table 1 – Environmental insurance providers in some MS

<table>
<thead>
<tr>
<th>MS</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Republic</td>
<td>Česká pojišťovna a.s.</td>
</tr>
<tr>
<td></td>
<td>Allianz</td>
</tr>
<tr>
<td></td>
<td>Kooperativa</td>
</tr>
<tr>
<td>France</td>
<td>AXA (Reinsured by Assurpol)</td>
</tr>
<tr>
<td></td>
<td>AGF Division AGCS (Reinsured by Assurpol)</td>
</tr>
<tr>
<td></td>
<td>AIG Europe (France)</td>
</tr>
<tr>
<td>Finland</td>
<td>AIG Europe S.A. (Finland)</td>
</tr>
<tr>
<td>Germany</td>
<td>Victoria Versicherung AG</td>
</tr>
<tr>
<td></td>
<td>Allianz Versicherungs-AG Deutschland</td>
</tr>
<tr>
<td></td>
<td>AXA Versicherung AG</td>
</tr>
<tr>
<td>Hungary</td>
<td>AIG Europe (Hungary)</td>
</tr>
<tr>
<td></td>
<td>Aegon Hungary Insurance Co.</td>
</tr>
<tr>
<td></td>
<td>Generali-Providencia Zrt.</td>
</tr>
<tr>
<td></td>
<td>UNIQA Insurance Co. (Hungary)</td>
</tr>
<tr>
<td>Ireland</td>
<td>XL Insurance</td>
</tr>
<tr>
<td></td>
<td>ACE Europe (Ireland)</td>
</tr>
<tr>
<td></td>
<td>Chubb Corporation</td>
</tr>
<tr>
<td></td>
<td>AIG Europe (Ireland)</td>
</tr>
<tr>
<td></td>
<td>Royal Sun Alliance (United Kingdom)</td>
</tr>
<tr>
<td></td>
<td>Crest Underwriting Ltd. (United Kingdom)</td>
</tr>
<tr>
<td>Italy</td>
<td>AIG Europe (Italy)</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Aegon Schadeverzekering</td>
</tr>
<tr>
<td></td>
<td>Allianz Nederland Schadeverzekering</td>
</tr>
<tr>
<td></td>
<td>Algemene Zeeuwse Verzekering Maatschappij</td>
</tr>
<tr>
<td></td>
<td>AXA Schade N.V.</td>
</tr>
<tr>
<td>Poland</td>
<td>UNIQA</td>
</tr>
<tr>
<td></td>
<td>WARTA</td>
</tr>
<tr>
<td></td>
<td>Commercial Union</td>
</tr>
<tr>
<td>Slovakia</td>
<td>Allianz - Slovenska poistovna a.s.</td>
</tr>
<tr>
<td></td>
<td>UNIQA poisťovňa, a.s. (Slovakia)</td>
</tr>
<tr>
<td>Spain</td>
<td>AIG Europe (Spain)</td>
</tr>
<tr>
<td></td>
<td>Mapre (Spanish pool)</td>
</tr>
<tr>
<td></td>
<td>Allianze (Spanish pool)</td>
</tr>
<tr>
<td></td>
<td>Caser (Spanish pool)</td>
</tr>
<tr>
<td></td>
<td>Pool Español de riesgos medioambientales (co-reinsurance pool)</td>
</tr>
<tr>
<td>Sweden</td>
<td>AIG Europe (Sweden)</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>ACE</td>
</tr>
<tr>
<td></td>
<td>AIG Europe (United Kingdom)</td>
</tr>
<tr>
<td></td>
<td>Chubb</td>
</tr>
<tr>
<td></td>
<td>XL Insurance Company Limited (USA)</td>
</tr>
</tbody>
</table>

- **Market based Instruments (taxes, permits, etc.)**

Six MS responded that they also resort to MBIs to offer coverage for environmental liability (Austria, Belgium, Bulgaria, Cyprus, Poland, and Spain). In Spain, it is recognised that taxes are the main channel for Public Administration to collect money and use it
for restoring damages caused to water bodies and shores, and to take air pollution prevention measures.

### Other instruments

In the Netherlands, the Decree laying down the general rules regarding environmental management for companies requires financial security to cover liability damages during the operation of oil stations for road traffic. The owner of a petrol station can meet these requirements by participating in a Collective Financial Security Fund. The Fund has been created by the sector itself and only pays in case of bankruptcy of the owner of the petrol station who is therefore not able to bear the costs of cleaning up the soil pollution.

In Sweden, Chapter 33 of the Swedish environmental code establishes a system for environmental remediation insurance. Operators pursuing environmentally hazardous activities for which a permit must be obtained or a notification filed to the relevant authorities, shall pay a pre-determined fee in order to finance common environmental damage insurance (Sw. miljöskadeförsäkring) and common environmental clean-up insurance (Sw. saneringsförsäkring). These insurances shall be used to pay damages and cover remediation costs, should there be inter alia no operator liable (i.e. in the case of orphan sites). However, an operator may not receive compensation from these insurances. As of today, the system does not encompass damage to biological diversity (according to the definition in the ELD) but an extension is under consideration.

### 3.4. DEVELOPING FINANCIAL SECURITY INSTRUMENTS

#### 3.4.1. DISCUSSIONS ENGAGED WITH INSURANCE AND THE BANKING SECTORS

Most MS are engaged in discussions with the insurance and banking sectors during the preparation work for the ELD transposition into national law. Indeed, all the MS that responded to the questionnaire declared having discussed existing uncertainties, concerns, and needs with insurance NA and other stakeholders. Some of the discussed issues include the establishment of a mandatory financial security scheme, the exemptions, and the methods for estimating damages.

In Austria (when national ELD transposition not finalised yet), discussions have been engaged with the Austrian Insurance Association which asked for information and data concerning the damage to protected species and natural habitats and required the transposition of the state of the permit exemption because current insurance products did not offer coverage in situations where the damage was the result of emissions or events explicitly authorised.

In Czech Republic, the Ministry discussed the possibility of launching a new insurance product to cover all liabilities under the ELD with the Czech insurance association. The conclusion of this discussion was that it was hardly possible to prepare such an insurance product:
• The fact that part of the liability under ELD for damages to wild fauna, flora and their habitats is not related to somebody’s health nor to somebody’s property was causing a problem for insurance principles.

• As insurance companies did not know the exact method used by public authorities to assess the costs of the damages a polluter could be obliged to pay in case of damage, they could not estimate possible costs for such measures.

• The Czech market is a relatively small market so the local insurance companies would need to be reinsured by larger international companies.

In France, the French ministry of Ecology, Energy, Sustainable Development and Spatial Planning met several times the FFSA (the French federation of insurance companies), Assurpol, insurance representatives, and MEDEF (Mouvement des Entreprises de France). Besides, a public consultation was also organised in October 2006.

During the implementation phase of the German transposition of ELD, German competent authority was in contact with insurers, especially the GDV, and several meetings were held with some insurers engaged in R&D-projects. Uncertainties and needs of the insurers were discussed, which were also kept in mind during the transposition process.

In Hungary, several rounds of consultations were held between the Ministry of Environment and Water, Hungarian Bank Association, Hungarian Insurers’ Association, and with individual market players. These consultations shaped the Hungarian legislation mainly regarding the type of instruments, type of cover, procedural issues, etc.

Ireland has consulted the insurance and banking sectors as part of the preparatory work to transpose the ELD (national ELD transposition not finalised yet).

In Slovakia, the Ministry of Environment organised some meetings with the insurance sector during the preparatory work for the transposition of the ELD, for example, about the establishment of mandatory financial security.

In Spain, both the insurance and the banking sectors have been involved in all public debates held during the legislation drafting process. Insurances companies have played a very active role during the discussion of the draft law on environmental liability. Their participation has been crucial and enabled the government to overcome difficulties both at the technical and economic level. Nevertheless, the banking sector showed poor engagement and almost did not contribute during the public debate of the draft law.

In United Kingdom, meetings have been held with both the insurance and re-insurance sectors and their responses have been taken into account in the transposition process.
3.4.2. **Measures to encourage market development**

For most MS, the main and most obvious factor encouraging market development is the transposition of the ELD as well as other pieces of national legislation introducing environmental liability. The approaches to encourage the development of financial security instruments and markets as requested by article 14 of the ELD do not differ much. In general, most MS have carried out information sessions and engaged different stakeholders in discussions about the implementation of the Directive in order to encourage the development of the environmental insurance market. The specific approaches are summarised below for some MS.

In Austria, a workshop titled "How to provide risk management and financial security in cases of environmental damages" was organised by the Austrian Standards Institute on the initiative of the Federal Ministry of Agriculture, Forestry, Environment and Water Management.

Belgium, Cyprus, Germany, Slovakia, Spain, and the United Kingdom, organised several information sessions and consultations with stakeholders.

In Spain, the Government sought the engagement of the insurance sector from the very beginning in the drafting process in order to raise awareness amongst the insurance companies. Furthermore, all demands coming from the insurance sector has been duly attended in order to overcome technical problems related to environmental risk assessment and to the proper restoration of the damages. Fruitful debates have allowed the government to get very useful inputs from insurers in order to tackle problems related to legal uncertainty, with respect to meet new needs in the field of risk assessment, and regarding the complexity of the relationship between the already existing insurance products and those to be put in place in the light of the new legislation.
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4. INSURANCE AND RE-INSURANCE IN THE EU

4.1. CURRENT STATUS OF THE INSURANCE MARKET

In Europe, until the early 1990s it was not unusual, for public liability insurance policies to offer cover for environmental damage as part and parcel of the policy in the sense that there were no exclusions in relation to such damage. This might now be regarded as offering such cover for free and changed on the back of larger environmental claims in the United States and as a result of some catastrophic losses in the market on the back of other long tail liabilities, particularly asbestos injury claims.

In 1990, the Association of British Insurers (ABI) recommended a standard form of wording to exclude liability for pollution or contamination other than that caused by “a sudden identifiable unintended and unexpected incident which takes place in its entirety at a specific time and place during the period of insurance”. Even then the ABI suggested imposing an aggregate liability limit for each pollution incident as remains; a clear indication that contamination arising from such incidents could be substantial. The tightening of coverage led to a new form of specialist environmental cover. Two of the main US carriers, namely Reliance and AIG, entered the market with Environmental Impairment Liability (EIL) cover in the early 1990s.7

Given that the ELD is still in the process of being transposed in some MS, the market development is currently hindered by uncertainties as to how different MS will transpose the Directive (see chapter 3. ). Indeed, nowadays, the insurance market covering environmental liability is still perceived to be in its infancy as regards the number of products that are available, their up-take, and many liabilities under the ELD that still remain uninsurable.

According to the CEA (CEA, 2007), environmental liability insurance schemes, particularly on site specific and stand-alone basis, represent still a niche market with only a relatively small number of insurers offering financial protection and with an overall estimated premium income in the region of €200 million. Cover is often requested as part of the purchase of real estate and the party financing the deal is seeking to protect their investment. In comparison, the estimated premium in the general liability market is €31 billion and the market for commercial General Third Party Liability (GTPL) is estimated €15 billion (CEA, 2007).

Most MS also consider their insurance market as basic (i.e. many liabilities under the ELD still remain uninsurable and limited amount of products in the market covering the environmental liability introduced by ELD).

7 Reliance went bankrupt in the early 2000s for reasons that were wholly unconnected to environmental insurance and does not offer products covering environmental liabilities anymore.
In some MS, there are no new products available specifically designed in the context of the ELD. There are, however, several 'old' products that cover, to a certain extent, the liabilities introduced by the ELD. In the Dutch market, for example, various private insurers offer their own Environmental Impairment Insurance (EII) (or *Milieuschadeverzekering* in Dutch), which covers the costs of primary remediation, mainly in the case of sudden and accidental pollution of soil and water on first and third party premises but not the financial consequences of remediation. Apart from this policy, some insurers provide for a General Liability policy (GLP) which is similar to EII and also gives cover for liability in case of sudden and accidental environmental damages. Finally, property insurance policies cover in some cases (depending on the individual policy wording) the costs of primary remediation of above ground level pollution (mainly sudden and accidental pollution) on first party and third party premises.

In some other MS, such as Spain, France, or the United Kingdom, some new products have been recently launched but, in most cases, they do not cover the full scope of the ELD (see chapter 6).

**4.2. INVENTORY OF INSURANCE AND RE-INSURANCE SCHEMES**

One of the first products to be developed in Europe was the integrated Environmental Damage Insurance in the Netherlands, covering the cost of remediation of environmental damage at the premises of the policyholder and damage at the premises of third parties (but not on the basis of liability law). This was developed by the Dutch insurance industry in 1998 where Achmea played a major role. In this approach, environmental liability is deliberately circumvented by giving any affected third party a contractual right to compensation under the polluter’s policy. The benefit is a swift resolution of the problem; however, cover was limited to clean-up costs only. The product was targeted at SMEs and the agricultural sector and had a take-up of about 40%. In practice, the claims experience has been good with very few cases of gradual pollution and most claims relating to asbestos pollution after fire (UNEP, 2007).

To date, insurers and re-insurers have been reacting cautiously to the ELD, but some new insurance product types do appear on the market. There have been mainly two types of products covering environmental liability:

- **GTPL products**

  GTPL products are limited to civil law and are supposed to cover the legal liability of insureds to compensate third parties for injury and damage to property suffered by them (Busenhart, 2008). In some cases, this can also include financial losses.

- **EIL products**

  EIL products include the cover for the legal liability of insureds to compensate third parties for injury and damage to property suffered to them as a result of a pollution event, including in, in principle, events that are ‘gradual’ in nature. (Busenhart, 2008)
(see Figure 5). EIL products cover both civil and public liability law. This is the solution proposed by large international insurers and ‘American’ insurers. Cover for EIL was traditionally taken out by parties in a land transaction, merger or acquisition. These were typically one-off deals, albeit with a large premium. These are still a major segment of the market. Nevertheless, current minimum premiums have helped broaden the appeal to some operating SMEs, for example, in the United Kingdom, the minimum premium is £750. Such minimum premiums have been possible because of increased market and automation of the underwriting process. The EIL market is still very limited, with very few insurers offering such products.

Figure 5 - EIL - exposure types

Standard GTPL policies are limited to civil liability law for bodily injury, for property damage and, to some extent, for financial losses. By contrast, the ELD is based on public law and therefore empowers the competent authorities to demand that operators prevent or remediate damage caused to the environment (Swiss Re, 2007). Therefore, in the context of ELD, an extension of GTPL policies is necessary.

The following options are currently being offered in the market to cover new liabilities introduced by the ELD (Zuefle, 2007):

- EIL products, e.g. the CARE policy introduced in France by Assurpol, products by American insurers such as ACE European Group and AIG.
- GTPL pollution coverage (civil liability) with ELD coverage extension (public law), e.g. Victoria proposes a solution integrated to GTPL.
- Stand-alone products, e.g. the non-binding stand-alone insurance model of the GDV followed by Allianz AGF, AXA, and XL Insurance. GDV is promoting a non-binding environmental damage insurance model: Umweltschadensversicherung or USV-Model, which is designed to fill the gaps
in GTPL and EIL policies. Other examples are ECOSPHERE developed by AXA Corporate Solutions and EnviroPro developed by AIG Europe.

- A combination of these solutions, e.g. the Pool Español de riesgos medioambientales proposes GTPL offered as stand-alone policy and AIG allows combining EIL Insurance with GTPL products, or other insurance offerings.

The main insurance products proposed by a selection of European insurance companies are summarised in Appendix 2 (as in Spring 2008). To provide more appropriate insurance solutions to cover new environmental liabilities introduced by the ELD, currently the insurers tend to develop more ELD-extended EIL and stand-alone insurance products (many of them are inspired by the non-binding German USV model and modifications of the US site-specific EIL) rather than GTPL/integrated products. Table 2 summarises main features of the products mentioned above. A more detailed description of some of the currently available ELD-relevant insurance products is presented in Appendix 3.

Table 2 – Comparison of existing products

<table>
<thead>
<tr>
<th>Product</th>
<th>Company</th>
<th>Policy type</th>
<th>Coverage</th>
<th>Exclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARE</td>
<td>Assurpol (Pool) (FR)</td>
<td>EIL</td>
<td>Third-parties for material damage and personal injury. Restricted to fortuitous events caused in the boundaries of the insured's site.</td>
<td>Damage as a result of permitted emissions, development risk, intentional acts, asbestos, GMOs</td>
</tr>
</tbody>
</table>
| Environmental insurance policies | ACE (UK) | EIL | - Premises Pollution Liability (PPL): Bodily injury, property damage and clean up costs for sudden and accidental pollution  
- Contractors Pollution Liability (CPL): Bodily injury, property damage, remediation costs and legal defence expenses for sudden and accidental pollution | |
<p>| ECOSPHERE | AXA Corporate Solutions (FR) | Stand-alone/EIL | Third-parties for accidental and/or gradual environmental impairment, emergency costs to avoid or mitigate claims, and for | Damages resulting from dangers unknown when a product or substance is developed. Other exclusions include |</p>
<table>
<thead>
<tr>
<th>Product</th>
<th>Company</th>
<th>Policy type</th>
<th>Coverage</th>
<th>Exclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>EnviroPro</td>
<td>AIG (Europe)</td>
<td>Stand-alone/EIL</td>
<td>Clean-up costs and losses arising from gradual pollution. Restoration of third-party sites, mitigation of pollution costs, third-party bodily injury and property damage</td>
<td>asbestos, electromagnetic fields, and genetically-modified organisms.</td>
</tr>
<tr>
<td>TopAz</td>
<td>AGF (Europe)</td>
<td>Stand-alone</td>
<td>Primary, complementary and compensatory remediation. Additionally, professional liability possible.</td>
<td></td>
</tr>
<tr>
<td>Environmental Liability Insurance</td>
<td>Pool Español de riesgos medioambientales</td>
<td>Mix</td>
<td>Property damage and mediation costs (primary, complementary and compensatory) of pollution emanating from the insured’s site.</td>
<td>Noise or electromagnetic fields, or changes in the water quantity of aquifers and superficial waters due to extractions. Normal operations, and deliberate non-compliance with regulations not covered.</td>
</tr>
<tr>
<td>USV-Model</td>
<td>USV</td>
<td>Mix</td>
<td>Restricted to sudden, accidental, unexpected and unintended incidents. Cover primary, complementary and compensatory restoration; prevention of imminent damage and minimization costs.</td>
<td>Intentional acts, mining operations and permanent storage of waste, asbestos, GMOs.</td>
</tr>
</tbody>
</table>
4.3. DEVELOPMENT OF INSURANCE PRODUCTS

While GTPL underwriting is based on past losses/claims and hazard assessment, EIL underwriting is based on environmental risk assessment due to absence of data. EIL underwriters take the information provided in environmental surveys supplied by the applicant and review the risks associated with each case on its own merits. Therefore, the uncertainties in respect to certain points in the ELD, e.g. the definition of the baseline, compensatory remediation, and cost and risk calculation, will affect the GTPL market as past data is not available. This is a bit different for the EIL market that has already been issuing policies concerning pollution-related losses arising from the ELD (CEA, 2008a).

Over the long term, it can be foreseen that there will be a fusion between the methods adopted by the GTPL and EIL underwriters. If the insurance markets develops as expected and a wide range of products are available, it will not be practical for a detailed risk assessment to be undertaken in every case, especially for less hazardous activities where the surrounding area is not particularly exposed. It is likely that these less hazardous risks will be more suitable for underwriting along the traditional GTPL methods while the larger and more complex cases will be dealt with through the EIL approach.

As discussed earlier, MS have tried to engage insurers and re-insurers in discussion during the transposition of the ELD into national legislation and in the implementation. On the other hand, only a few insurers (nine out of twenty-two responses received) declared to have discussed with the authority in charge of transposing the ELD at a national level during the development phase of the products (mainly Spanish, Hungarian, German, and Slovakian insurers declared having discuss with the Ministry of Environment of their country). In those cases, such dialogue have contributed to better designed ELD-related products, albeit limitations in the coverage still exist and products covering environmental liabilities remain limited to date.

One of the main barriers for the development of more far-reaching products in the EU is the lack of data on the frequencies and severities of losses (environmental damages). Nevertheless, very few insurers have discussed to date with the authorities on appropriate assessment and calculation methods (only the Pool Español de riesgos medioambientales, AXA, and Generali-Provendencia have gone through this process).

In some cases, insurers have also consulted the insurance NA. For example, Victoria, Allianz and Partner Reinsurance quoted GDV as their interlocutor during the development phase. The discussion with the national authorities and associations helped some of the insurers to base their product development on external guidelines provided by NA. In some cases, they even participated in the elaboration of such guidelines (e.g. Pool Español de riesgos medioambientales). GDV’s guidelines are followed by five insurance companies: three German insurers, a Swiss insurer (Swiss Re-insurance Company), and an American insurer (XL Insurance in United Kingdom). Zurich Insurance Ireland is using the experience of its US branch.
Alternatively, some insurers consulted potential clients during the product development phase. For example, the Pool Español de riesgos medioambientales, Victoria, Allianz, AGF, and Generali-Providencia discussed with several associations of industrial entrepreneurs. Allianz, AGF and AIG are also gathering feedback from their clients. From the point of view of the reinsurers, Partner Reinsurance and the Swiss Reinsurance Company have both discussed with the insurers and are in contact with them.

Some other insurers have also developed their own guidelines. These are often developed to address new kind of risk assessment or pricing. Those who have experience with EIL, such as AIG and Victoria, are extending it to ELD issues.

In this regard, insurers collaborate with their reinsurer as well on the development of the policy guidelines. Six of the insurers that answered the questionnaire (Allianz in Slovakia, AGF in France, AEGON Hungary, Generali-Providencia and UNIQA in Hungary and Slovakian Republic) are engaged in this process with their re-insurers.

Due to a limited experience of insurers with the liabilities under the ELD and the limited access to reliable statistical data, there is a considerable degree of uncertainty over the probable frequency or cost of claims. Therefore, for new products to emerge there is an important capital requirement to support them and this will directly impact the premium levels. As the experience of insurers increases over time, it is possible that the capital requirements will change, which in turn could affect the levels of premiums required. However, in the early days of an emerging market, it must be expected that premium would be set at what might be termed ‘cautious levels’. The initial premiums in developing national markets would be largely influenced by the specificities of the national transpositions. For example, proportional liability rather than “joint and several” liability is likely to result in lower premiums. Put simply, the more ambitious the national regime, the greater the uncertainty will be for the insurers, resulting in higher premiums, more restrictive cover, or no products at all.

4.4. COMPARATIVE ANALYSIS OF INSURANCE PRODUCTS

In order to evaluate the product types identified above and to see how far they provide operators with sufficient cover for their environmental liabilities under the ELD, a comparative analysis is presented here.

As discussed earlier, insurers in most cases either offer EIL related products, extensions to traditional GTPL, products or develop stand-alone environmental liability products to cover liability arising from the ELD. These approaches can be effective but they have important advantages and disadvantages (CEA, 2008 a):

a) Stand-alone products (EIL and new ELD adapted solutions)

Advantages of a stand-alone product:

- A clear distinction between civil and public law-based insurance cover, which would increase transparency in insurance markets.
• It facilitates the development of insurance solutions that can be adapted quickly and easily in response to emerging trends.

• Development of innovative, specialist, and flexible solutions is more likely in stand-alone insurance products than other solutions.

Potential disadvantages of a stand-alone concept:

• This approach could still result in the duplication of claims in cases where a concurrence of environmental liability with traditional third party pollution liability covers exists in the event of a loss. This would be the case if the same pollution event triggers third party property damage and bodily injuries as well as environmental damage.

• Insurers have to take into consideration their accumulation potential in order to put in place proper controls or establish the proper loss accumulation limitation clauses as appropriate.

• Increased administrative expenditure can be incurred by the insurer having to issue and manage specific policies on a separate basis.

b) Integrated products (GTPL)

Advantages of integration into existing insurance solutions (Busenhart, Juerg, 2008):

• Insurers will avoid potential accumulation problems if policies state clearly the maximum amount of cover offered for all liabilities, including such extensions of cover.

• The development costs of such a solution and the administrative expense incurred by the insurance company in managing the policy are likely to be much lower than in the case of stand-alone insurance products.

Potential disadvantages of integration into existing insurance solutions:

• Different liability concepts, i.e. civil and public liability, are mixed in a single policy.

• Premium allocation and tracking of claims might be needed to be separated from the standard cover.

• It could be difficult to track the development of ELD claims which is important for the assessment of the Directive.

• Pollution to land owned or occupied by the insured or by a third party is one of the main areas of environmental liability. In this regard, it is important to consider that GTPL insurances usually exclude damage to property owned or controlled by the insured. This is relevant both for deciding on the coverage for costs of remediation and of prevention of imminent damage to soil

In both cases, it should be noted that a number of ELD responsibilities are covered directly or indirectly under other traditional insurance products. Examples for this
include the Motor Third Party Liability (MTPL) insurance for transports of hazardous goods or professional indemnity insurance that would cover damage resulting from planning errors and the transport of dangerous goods or waste specified in Annex III. Swiss Reinsurance Company, AXA and Partner Reinsurance cover ELD in their MTPL. Insurers and policyholders need to ensure that they are well aware of the new risks that might be encountered also under these policies due to the ELD and of the potential overlap with the newly developed policies. A possible development that could be considered by public liability insurers and their re-insurers to avoid such overlaps could be to delete the qualified pollution exclusion in their policies in favour of absolute pollution exclusion (Fogleman, 2005).

### 4.4.1. Coverage

Existing policies do not cover all responsibilities under the ELD. Table 3 shows the gaps in existing policies compared to the scope of the ELD, based on the information presented above and in Appendix 2.

**Table 3 - Potential gaps in environmental liability insurance cover**

<table>
<thead>
<tr>
<th>Scope of coverage</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact on the environment</td>
<td>The ELD refers to all types of impacts on the environment whereas environmental liability insurance, as well as GTPL insurance usually limits the cover to pollution events. Some specific products are available in the EU market that extend coverage to other kind of impacts.</td>
</tr>
<tr>
<td>- pollution events</td>
<td></td>
</tr>
<tr>
<td>- other impacts on the environment</td>
<td></td>
</tr>
<tr>
<td>Definition of environmental damage:</td>
<td>Damages to land and/or water are usually covered to some extent. For damage to protected species and natural habitats, a very limited number of products are currently available in the European market.</td>
</tr>
<tr>
<td>- damage to land</td>
<td></td>
</tr>
<tr>
<td>- damage to water</td>
<td></td>
</tr>
<tr>
<td>- damage to protected species and natural habitats</td>
<td></td>
</tr>
<tr>
<td>Causes of environmental damage/impact on the environment as a result of:</td>
<td>Insurance usually excludes emissions based on the normal undisrupted or permitted operations. This limitation is not always explicitly found. The ELD does not differentiate between these two categories.</td>
</tr>
<tr>
<td>- a sudden &amp; accidental/fortuitous event</td>
<td></td>
</tr>
<tr>
<td>- normal undisrupted or permitted operations</td>
<td></td>
</tr>
<tr>
<td>Environmental damage as a result of defective products and works (products liability and completed operations)</td>
<td>Usually covered under product liability policies and generally limited to traditional damage (i.e. bodily injury and damage to property). Environmental liability insurance usually does not cover products liability. The ELD foresees that MS shall take the appropriate measures to enable the operator</td>
</tr>
</tbody>
</table>
As it will be further discussed in chapter 6, the ability to calculate the probability and magnitude of a loss is essential for the development of insurance products. If the insurer ideally has perfect information on the probability and the magnitude of the damage, a risk can be considered as insurable. On the basis of statistics and probability principles, the insurer will require information on the likelihood that the risk will occur; which may also provide information on the possible magnitude of the damage. Both these requirements may, however, be a problem in the case of environmental liability insurance, as the sample size of cases is not large enough to make some useful statistical analysis.

Consequently, not all insurers cover the activities explicitly listed in Annex III of the Directive. Indeed, insurers usually exclude some activities in their policies, usually those for which less information is available on the frequencies and severities of losses. Genetically Modified Organisms (GMOs) and waste management are often quoted as excluded from the product coverage. Activities not listed in Annex III are also covered under specific conditions for some of the insurers. Only four of the insurance providers that answered to the questionnaire (AIG divisions in different MS, the American XL Insurance company in the United Kingdom, Zurich insurance, and the Pool Español de riesgos medioambientales in Spain) cover all the activities listed in Annex III of the ELD (Annex III of the Directive).

As showed in Appendix 2 and 3 and Table 2, most recent insurance products cover sudden and accidental pollution (EIL and stand-alone products, as well as GTPL), while only a few cover gradual pollution as well on standard basis (e.g. Ecosphere or...
Indeed, most companies (twelve in total) who answered the questionnaire indicated covering only sudden and accidental pollution, gradual pollution being only covered by a few (e.g. AIG divisions in Sweden, Finland, Hungary, Spain, France and Italy, the *Pool Español de riesgos medioambientales* in Spain, Allianz in Slovakia and AGF in France). In the case of AXA Germany, gradual pollution is only excluded as a consequence of state of the art exemptions.

Most insurers also cover primary and complementary remediation, while compensatory remediation poses some difficulties and is perceived by the insurers as the second most persisting limitation of their products. Yet, there are different products in the market that cover compensatory remediation (sixteen insurers, which also provide primary and complementary coverage, declared to have products covering this type of remediation). However, some of these insurers covering compensatory remediation provide this type of remediation only for cases with limited sums insured (*Pool Español de riesgos medioambientales*, Victoria, and Swiss Reinsurance Company).

These observations are in line with the limitations of existing products highlighted by the MS that participated in the survey. In particular, the non-existing or limited coverage for gradual pollution and for compensatory remediation are highlighted as the most pressing limitations by MS (as illustrated by Figure 6). In most cases, there is a limited number of insurance products available covering risks that need some extra time to be assessed, such in the case of compensatory remediation with regard to damage to biodiversity.

**Figure 6 - Limitations to insurance products as identified by MS authorities**

Whereas for primary and complementary compensation the insurance industry has some, albeit limited, experience, for compensatory remediation this experience does not really exist and the industry cannot base its calculation on the experience of other sectors as the calculations of amenity or biodiversity services losses are rather new ones.
The national laws transposing the ELD apply to the specific MS territory only. However, potentially liable operators are not only responsible for damage occurring in their home country. Indeed, environmental damage might also occur on a cross-border basis involving neighbouring countries or an insured’s activities could result in liability involving many European countries, e.g. trans-boundary pollution of watercourses or services provided outside the home country (see Box 6, page 89) about a pollution event in Belgium). Most companies do cover cross-border damage (sixteen insurers declared to cover it, see Figure 7). Furthermore, most insurers also offer products to operators operating in more than one MS. From the responses that were received to the industry questionnaire, only six insurers declared that their products are limited to operations in their home country (Generali Providencia, AEGON Hungary, Partner Reinsurance, AXA Winterthur and UNIQA in Hungary and Slovakia).

Only AIG (six different divisions in Europe) covers the damages caused by expressly authorised activities or those not considered as hazardous according to the state of scientific and technical knowledge when the activity was covered.

Regarding the ELD-definition of environmental damage, most insurance products only cover damages related to soil and water. For example, in the Czech Republic and the Netherlands, only property damages related to soil are covered by insurance. In the United Kingdom, there is a limited market for insurance which very largely covers transactions where there may be risks from contaminated land.

**Figure 7 - Number of insurers covering each type of issue**

![Bar chart showing the number of insurers covering different types of issues](chart.png)
4.4.2. **INSURANCE CAPACITY AND COMPETITION ISSUES**

The traditional insurance system is based on the assumption that risk is quantifiable, in order to define the right premium that the insured will have to pay to the insurer for transferring the risk. The traditional system therefore works in four phases: risk assessment, risk transferring, risk pooling, and risk allocation.

However, as commented earlier, following the introduction of the Directive, there is a degree of uncertainty regarding the costs of compensation for (CEA, 2008 a):

- The inability to remediate the damaged resource to baseline through primary remediation alone, i.e. complementary remediation and/or
- The loss to the environment between the point of damage and attaining baseline conditions, i.e. interim losses associated with compensatory remediation
- The expenses required to evaluate the extent of compensation.

These uncertainties still affect the underwriting process, the premiums and the capacities offered. The insurer may react to this uncertainty by providing for an adequate reserve to be able to provide coverage for the environmental damage once it occurs.

It has been highlighted in certain MS that in spite of the fact that the market is developing and the capacities are growing, these are still insufficient to face potential losses related to environmental damage. The issue of capacity were highlighted, for example, by France and the Netherlands.

According to an estimate by Guy Carpenter, in Europe, a re-insurance intermediary, most insureds will be able to purchase between €2 million and €20 million of coverage as of now if they buy products that are extensions of their current public liability policies. However, if policies need to be written separately to respond to claims outside civil law, capacity from insurers will initially be limited to between €3 million and €10 million. The capacity of existing specialist European EIL business of the leading EIL insurers, such as ACE, AIG, Chubb XL and Zurich, is estimated at around €200 million and this could more than double by 2010. Furthermore, the coverage for this kind of policy from the specialist EIL market should be available with a maximum of €50 million from any one EIL insurer and up to €100 million to €200 million on a syndicated basis (Guy Carpenter, 2007).

According to the information obtained by means of the industry questionnaire, the reimbursement ceilings of different policies currently being offered by insurers range from less than €1 million (e.g. UNIQA) to more than €30 million (e.g. *Pool Español de riesgos medioambientales*, Zurich Insurance, and AGF France), depending on the risks that are covered, the type of product, and the amount of premium. Four insurers (Allianz Germany, AXA Winterthur, Generali-Providencia and XL Insurer,) indicated coverage between €1 million and €20 million. EIL specialist such as AIG could supply
with €50 million liability coverage. These figures are in line with the estimates by Guy Carpenter presented above.

Still, this capacity might not be sufficient to cover certain pollution events. For example, in 1998 the collapse of a waste retention dam of a mining complex (Boliden Apirsa SL) in Aznalcóllar, Spain, led to a flow of toxic sludge and waters towards the Doñana National Park, a Natura 2000 site. A significant area of wetland known as ‘The Entremuros’, protected as Special Protection Area (SPA) under the Birds Directive, was affected by the spill. The loss minimisation measures and the primary restoration amounted to €101m. The creation of the “green corridor”, complementary restoration regarding the ELD, amounted to nearly €70m. Such costs could not be covered by the coverage currently being offered by most insurance companies, but by the coverage capacity of €200 million on a syndicated basis mentioned above.

Insurer can use various traditional insurance techniques to cope with this capacity problem. One possibility is to insure a similar risk jointly with a few insurers (so-called co-insurance); another possibility is re-insurance (Faure and Grineaud, 2000).

For example, it would be possible to provide higher capacity with cooperation between different insurers. It has been estimated that up to €200 million of capacity could be achieved with a structured programme in cooperation with different insurers. AIG alone could supply with €50 million liability coverage.

Another possible solution often used in case of environmental liability insurance is pooling of capacity by insurers. In many countries insurers have shared risks in mutual pools on a non-comparative basis to be able to provide coverage, also for risks with a relatively high potential magnitude. This is typically the case for the nuclear risk.

One could argue that these types of co-operation described above (co-operation and pooling) may endanger the competition between insurance and financial institutions. Indeed, it is interesting to note that the nuclear example showed the possible negative consequences of pooling in the long run: if pools act like monopolistic insurers premiums might be relatively high and unattractive for specific operators. This lead some nuclear power plants to withdraw from the pools as far as first party coverage was concerned and to examine the possibilities of a mutual between operators. Consequently, this type of cooperation could go against competition laws. Indeed, such groups can involve restrictions of competition, such as the standardisation of policy conditions and even of amounts of cover and premiums. The European Commission is, from a competition policy perspective, rather cautious with respect to allowing collaboration between insurance undertakings with a view on pooling. It is therefore appropriate to lay down the circumstances in which such groups can benefit from exemption.

In this regard, the Commission adopted a Block Exemption Regulation (BER) (EC DG Competition, 2008) in 1992 (Regulation 3932/92) and, when this Regulation expired at the end of March 2003, the Commission replaced it with Regulation (EC) No 358/2003 adopted after in-depth consultation with insurance sector organisations, consumer and
public sector bodies. The Regulation grants an exemption to the application of competition rules to certain types of agreements in the insurance sector, namely agreements on:

- Joint calculations, tables and studies
- Standard policy conditions and models on profits
- Common coverage of certain types of risks (pools)
- Security devices / safety equipment

The agreements that meet the well-specified conditions and requirements fixed by its provisions are ipso jure exempted, this being binding for the courts and competition authorities. The BER permits the formation of pools for a class of insurance for which capacity would otherwise not be easy (if not impossible in certain cases) to obtain. According to the BER, for new risks, a pooling arrangement can be exempted for a limited period of time. For risks which are not new, it is recognised that such co-insurance and co-reinsurance groups, which involve a restriction of competition, can also, in certain limited circumstances, involve benefits (e.g. allow their members to gain the necessary experience of the sector of insurance involved, they may allow cost savings, or reduction of premiums through joint reinsurance on advantageous terms).

In such cases, the Regulation therefore grants an exemption to any such co-insurance group which has existed for more than three years, or which is not created in order to cover a new risk, on the condition that the insurance products underwritten within the group by its members do not exceed 20 % of the market. Therefore, some existing pools might not benefit from the block exemption in the near future as the market share of its members exceeds the thresholds exemption regulation as market develops.

On the other hand it is also specified in the BER that “In any event, the commission will consider that pools no matter how high their market share is, are not covered by article 81-1 (ex-article 85-1) when they are necessary to allow their members to provide a type of insurance they could not provide alone”.

In general, the CEA argues that regarding competition, environmental pools are only allowed to fix the technical part of the premium, thus allowing pool members to compete among themselves. Operating expenses and earnings are freely settled by each one of them. About the maximum share of the market, the CEA believes that the BER’s limitations (20% limit for insurers) is not appropriate as this may enable smaller insurance companies to cooperate with companies that have market share exceeding this limit. Furthermore, it indicates that the concept of “new risk” is too restrictive and should be redefined and that the exemption period in Article 7 (1) of the BER should be extended from three to five years in order to help insurance and reinsurance undertakings to acquire sufficient experience of risks with which they are unfamiliar (CEA, 2008 b).
It is important to highlight that without the legal framework offered by the BER, it would be nearly impossible to set up national insurance pools due to European and national competition laws.

The Insurance Block Exemption Regulation will expire on 31 March 2010. The Commission is required under the Implementing Regulation (Council Regulation (EC) 1534/91) to submit a report to the European Parliament and Council on the functioning of the Block Exemption Regulation together with any proposals for amendment in the light of experience, by March 2009. To this end, the Commission has launched a Consultation on the basis of which it will review the functioning of the Block Exemption and prepare the Report.

Competitive insurance markets have worked out all kinds of devices to cope with relatively large, even so-called catastrophic, risks in order fields. The individual insurer can always limit insurance coverage up to the amount for which he is willing to provide coverage, either himself or in combination with co-insurance, or re-insurance. The capacity will only define the amount of coverage available which will be defined in contractual limitations. In some cases, the magnitude of the harm could still be larger than the insured amounts (even with pooling and re-insurance).

This may then be an argument to examine whether alternative compensation mechanisms could provide for larger amounts than insurance, but there is no reason to assume that this will as such automatically be the case. Moreover, the capacity to cover the environmental risk depends on a variety of complex elements and not only upon the individual reserves of an insurer or his capacity to obtain reinsurance. The capacity of insurers can be expected to increase over time, as the experience with ELD-related products increase and loss risks are better known.

**4.4.3. CURRENT AND FUTURE UPTAKE**

At the present time, it is difficult for the insurers to evaluate the efficiency of their products covering ELD, mainly due to their recent introduction in the market and novelty. Only six insurers participating in the survey were able to describe the uptake of their new product, and all of them describe it as fairly good (XL Insurance, AEGON, Partner Reinsurance, Victoria, AGF, and AXA).

Regarding the percentage of demand for environmental insurance stemming from the ELD that insurers expect to be coverable by the insurance market in 2008, most insurers are not sure and estimations range from 0% (Generali-Providencia) to 100% (AIG). About the situation by the end of 2010 (Figure 8), all of the insurers that were able to answer, estimated that the coverage could be of more than 80%, except in the case of the *Pool Español de Riesgos Medioambientales*, who estimated a coverage of 60%. It can be noticed that more than a half of the insurers were not able to estimate the future demand for environmental insurance expected to be coverable.
4.5. ALTERNATIVES TO LIABILITY INSURANCE

Knowing that the European insurance market is not currently in the position to cover all environmental liabilities under the ELD, it is important to explore the alternatives to liability insurance. Depending on the insurers’ risk appetite and environmental risks as well as the financial situation (including tax legislation) it could be of interest to spread the risks and costs on different types of other financial instruments. As discussed below, Alternative Risk Transfer (ART) arrangements together with self-insurance, form an alternative market to environmental liability insurance.

Indeed, ART presents some advantages including improved efficiency (through participation in own loss development or the reduction of over insurance), the increase of capacities (e.g. financial markets are capacity providers) and the extension of the spectrum of insurable risks and coverage over time.

Insurers sometimes advice their clients to take alternative products to cover for the ELD liabilities excluded from the insurance product. The *Pool Español de riesgos medioambientales*, the Swiss Reinsurance Company, Partner Reinsurance, and XL Insurance advise their clients to use self-insurance. Warranties are also advised in some cases (as indicated by the *Pool Español de riesgos medioambientales*, Generali providencia, Allianz Slovakia, Zurich Insurance, AEGON and UNIQA). Only XL Insurance advises funds as an alternative.

It is generally accepted that there are two segments in the ART market — risk transfer through alternative carriers and risk transfer through alternative products. Some of these are further explained below.
4.5.1. **ALTERNATIVE CARRIERS**

The market for alternative carriers (i.e., risk-bearers) consists of among others (Swiss Re, 2003):

- **Self-insurance**
  
  Full or exclusive self-insurance is rare, but a combination of self-insurance and commercial insurance usually provides the best cover for the self-insured. Usually the predictable losses of the risk are retained and self-insured, forming a first or “working” layer of cover, and a stop-loss or stop-gap policy is purchased from the commercial insurance market. The commercial insurance market then pays for losses above the specified self-insurance limit per loss, thereby stopping the cost of losses to the self-insured above the retained values. Indeed, the losses paid for by the insured before the stop-loss policy pays becomes the deductible layer. Depending on the level at which risks are stopped, commercial insurance cover should become less and less expensive the further away the commercial insurer moves from the working layer of paying claims each year.

- **Captives**
  
  A captive is insurance or re-insurance company owned by a corporation or a group of corporations which are not active in the insurance business themselves. Another definition of captive is insurer that writes risks whose origin or access is restricted. The primary business purpose of a captive is to insure the risks of the company who owns it, its “parents”.

- **Risk retention groups**
  
  Risk retention groups were introduced in the US in 1986 as an alternative for corporations to handle third party liability such as errors and omissions, medical malpractice, professional and product liability. Workers’ compensation, personal lines and property risks are excluded.

- **Pools**
  
  Pools are arrangements between corporations or insurers to mobilise sufficient capacity for very large risks. Pools also allow insurers to develop new insurance products, and share information and statistical data. They are typically organised on a national basis to cover a specific risk class, for example the home-owners’ natural catastrophe pool in Spain or the nuclear risk pool in Germany, Spain, France, and Italy, as indicated earlier, have pools that provide a limited coverage that cater specifically to the ELD:

  - Italy: Pool Inquinamento, created in 1979, has 38 insurance companies and 4 re-insurers.
  - France: Assurpol, created in 1989, is a pool of 40 insurance and reinsurance companies, both French and foreign.
• Spain: The *Pool Español de Riesgos Medioambientales*, created in 1994, gathers 20 Spanish insurers and 8 re-insurers proposing stand-alone products to cover the ELD related liabilities.

In Germany, there are discussions for the constitution of a pool that will deal mainly with policies limited to accidental and unexpected events.

Among these products, corporate financial security of environmental risks is currently handled mainly through self-insurance and captives.

### 4.5.2. Alternative Insurance Products

Alternative products include, among others:

- **Finite risk plans (ex-ante guarantees and deposits)**

  These plans are self-financing programmes that involve the formal participation of some external agent. Clients pay either annual or single premiums into a designated account, which is usually managed by an external agent. These funds earn a contractually agreed investment return and are used for eventual loss payments.

  Finite risk plans usually work in the following way (ORRF, 2001):

  - The policyholder capitalises its account through the payment of premiums
  - The insurer deals with the administration of the account (e.g. premium calculations, claims management etc.)
  - The insurer may provide some excess insurance to cap the policyholder’s losses. A common arrangement is for the policyholder and insurer to share any losses that exceed the value of the account, with the policyholder bearing the greater percentage of these losses
  - The insurer may also guarantee a line of credit to the policyholder in the event that losses cause the account to become empty
  - At the end of the contract any remaining capital is returned to the policyholder.

  This solution is sometimes used to smooth out long-term liabilities from companies, which for instance is an attractive solution for prospective buyers during mergers and acquisitions. Therefore, finite risk plans allow a firm to spread losses over time. This is in contrast to insurance where losses are spread over policyholders.

  In addition, by utilising the risk management skills of an external agent, the real service efficiencies provided by an insurer may also be achieved. Nevertheless, finite risk plans merely provide a way of structuring the financing of retained risks and do not involve risk mitigation or transfer. As such, they are not a perfect substitute for insurance.
It is difficult to provide a satisfactory general definition of finite reinsurance. Essentially, the products typically have the following features:

- Risk transfer and risk financing are combined and the time value of money is emphasised in the contract
- Limited assumption of risk by the (re)insurer
- Multi-year contract term
- Explicit inclusion of investment income in the contract
- Sharing of the results with the insured/cedant.

### Run-off solutions

For retrospective liabilities, run-off solutions are a tool to address a company’s current costs for past activities. The term run-off is used to refer to a special segment of managing retrospective liabilities. Unlike retrospective finite products, which usually substantially limit the amount of underwriting risk transfer, run-off products focus on the full-scale transfer of risks. There are a number of special situations that motivate a company to choose a run-off option, like corporate restructuring, mergers & acquisitions, discontinuation of lines of business, erratic changes in the valuation or cost of a liability, or regulatory, accounting or tax changes. The biggest run-off transactions to date in the United States have involved either asbestos & environmental (A&E) or workers’ compensation liabilities. Most transactions have involved insurers, but the economics also work for corporations and captives.

### Trigger products: Multiline, multiyear, multi-trigger

Integrated multi-year/multi-line products (MMP) have been recently developed in alternative to corporate risk transfer. They combine different categories of risk in one product over several years, thus allowing substantial risk to be transferred. They provide an alternative to additional insurance during hard market conditions. Benefits for policyholders include administrative efficiency, stabilization of risk costs, and flexibility. However, they present some drawbacks, including the high transaction costs, the credit risks, limited offerings, and lack of clarity on accounting and tax regulations (Swiss Re, 2003).

In a multi-trigger product (MTP), payments for losses from an insurance risk are only made if a second event or risk is triggered (therefore, two triggers for claims to be paid: an insurance event and a non-insurance event). The second condition for the payment is frequency linked to an index outside the influence of the policyholder to avoid moral hazard. Nevertheless, there must be a high correlation of the trigger variable with the policyholder’s financial interests to create an effective cover.

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8 Insurance market presenting higher premiums, new exclusions, and reduction of limits provided.
These products are generally attractive to companies whose earnings are heavily affected by fluctuations in commodity prices, exchange rates, and interest rates. These policies are designed to provide cover for companies that believe they can withstand losses on their risk portfolios but would experience difficulty if the losses coincided with events that crystallize asset risk.

The insurers offering the MTP are interested in using triggers that are uncorrelated with each other. The joint exposure is substantially different from the exposure of the individual risks, which creates competitive advantage in pricing the products as less risk capital needs to be set aside.

- **Contingent Capital**

Committed capital, often referred to as contingent capital, is a form of prearranged financing provided to a company after it experiences a financially stressful event (e.g. remediation costs resulting from environmental liability). The company that purchases the committed capital option has the right to sell its own securities at a pre-fixed price for a period of time, after the specific event has occurred. It is important to highlight that committed capitals are not an insurance product, but a product that is structured and priced using a combination of insurance and capital market techniques (Swiss Re, 2003).

The most common used financial solutions within this field are so far finite risk reinsurance.

### 4.6. EXPERIENCE OUTSIDE THE EU

Outside the EU, the most developed environmental liability insurance market is in the US. It is therefore important to analyse this market, its characteristics and the extent to which its development can be taken as an example to anticipate future European development and lessons to be learnt from the US experience.

#### 4.6.1. US ENVIRONMENTAL LIABILITY REGULATION

In the US, liability in connection with environmental impairment is regulated in various special laws. At the federal level, the most important of these are the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); the Oil Pollution Act (OPA) and the Clean Water Act (CWA). These laws also recognise environmental damage, referred to as “natural resource damages” or “NRD”. The definition of NRD in CERCLA and OPA is very broad, covering soil, air, water, groundwater, fish, fauna, flora, and other resources. However, these resources are protected only when they are the property of or administered by the US government, a state, a Native American tribe or a municipality. The CWA regulates the discharge of hazardous materials into navigable waters. There is also the Resource Conservation and Recovery Act (RCRA), which gives the US Environmental Protection Agency (EPA) the authority to track hazardous waste from the time it is created, until it is recycled, treated or disposed of. RCRA focuses
only on active and future facilities and it does not generally address abandoned or uncontrolled hazardous waste sites.

NRD generally entails the following compensation or remediation measures:

- Restoration to the baseline condition
- Loss-of-use compensation
- Reimbursement of costs for investigating the damages

**Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) 1980**

The Comprehensive Environmental Response, Compensation and Liability Act was amended in 1980 in response to the discovery of toxic waste dumps in Love Canal (Box 2) and Times Beach (Box 3) in the 1970s. It established the Superfund environmental program which allowed the EPA to address abandoned hazardous waste sites by realizing cleanups and compelling responsible parties to perform cleanups or reimburse the government for EPA-lead cleanups.

**Box 2 - Love Canal (New York State) 1920**

In 1920, a former canal joining two branches of the Niagara river and whose construction had not been completed was bought by the Hooker Chemical and Plastics Corporation to be used as the main site for burying the company’s toxic waste. Between 1947 and 1952, 22,000 tonnes of toxic waste where buried there together with thousands of additional tonnes from the US army. Afterwards, the area became habitable and hundreds of houses were built. In 1955, a school was even constructed on the exact location of the canal.

Lobbying from EPA and local activists led to the destruction of the school and of 237 houses. In 1980, the state of emergency was claimed by the president and 800 families were rehoused.

The US Justice Department together with the EPA sued the chemical company to have it cover the costs of the incident. The company’s contribution eventually reached $129 million.

According to the CERCLA legislation, hazardous sites account for any uncontrolled and abandoned place where hazardous waste is located possibly affecting local ecosystems and people and are registered on a national priority list which accounts today for around 1200 sites (US EPA, 2008).
Box 3 - Times Beach (Missouri) 1925

Times Beach was a city created in 1925 and promoted through a marketing campaign made by a newspaper. Depression and World War II also contributed to the development of the city. Local taxes were quite low so that they did not generate enough resources to maintain local infrastructures. In order to solve a summer dust issue, the services of a dirty oil recycling company were contracted so that in the 70s dirty oils were sprayed all over the city. Nevertheless, these oils were contaminated with dioxins so in 1982 the city had to be evacuated.

More than 265,000 tonnes of contaminated soils have had to be removed between 1996 and 1997. The overall cost of the cleanup reached $110 million among which $10 million were financed by the company.

A preliminary assessment of a potential hazardous site can be petitioned by any person or organization and will be undertaken by EPA through the Hazard Ranking System (HRS) which evaluates:

- The likelihood that a site has released or has the potential to release hazardous substances into the environment.
- The characteristics of the waste (toxicity and quantity).
- The people and sensitive environment affected by the release.

The Superfund program is overseen by the EPA’s Office of Solid Waste and Emergency Response (OSWER) in Washington DC among which the Office of Emergency Management is responsible for short term responses and the Office of Superfund Remediation and Technology Innovation and the Federal Facilities Response and Reuse Office have the lead for managing the long-term Superfund response program. EPA’s 10 regional offices around the nation are the front line in responding to releases of hazardous substances and other emergencies.

Between 1980 and 1994, the program was financed by public funds through a tax on polluting activities. This allowed the EPA to undertake preliminary assessments and to bear the decontamination costs in case of responsible parties’ insolvency.

The program has nevertheless had mixed results as even if over the past 20 years tens of thousands of hazardous waste sites were located and analysed and people and the environment were protected from contamination at the worst sites, much money was lost in legal spending and only few sites were efficiently decontaminated. The points of the program that were criticised can be summarised as (Sénéchal, 2007):

- **Financial crisis**: Since the abolition of the tax on polluting activities by the Congress in 1994, the program has been suffering a financial crisis. It is now mainly financed by a federal grant around $1.2 billion a year that only accounts for one third of the 1980 fund.
• **Scattered Federal politics:** Because of the various Federal departments involved in environmental issues, EPA and States often disagree regarding the way environmental risks and cleanup pollution should be tackled.

• **Administrative slowness:** CERCLA has been largely criticised as being too bureaucratic and not efficient enough. Around one third of the costs account for legal spending leading to delays in the process and reducing resources allocated to decontamination.

• **Difficulties in implementation:** The program is often criticised by industrials which deplore the lack of incentives to fight contamination. Moreover, the decontamination process is usually quite slow as 10 years are usually required to implement the decontamination plan.

• **Orphan sites:** They correspond to contaminated sites for which a responsible party cannot be found for bearing the decontamination costs and are often not registered on the national priority list.

• **Small parties trapped into legislation:** The law has been criticized as offering too many ways of escaping liability. In case of insolvency from the polluting party, the liability of the shareholder or of the parent company is not clearly stated. Moreover, the lack of compulsory insurance or financial guarantee is also seen as controversial.

• **Non commercial damage:** The program aims at decontaminating hazardous sites without taking into account non commercial damage like biodiversity loss.

CERCLA focuses on the remediation of pollution caused in the past. As such, it contrasts with the ELD, which centres on environmental impairment caused after the 30th of April 2007. The task of the US EPA is to discover hazardous waste sites – i.e. those in need of cleanup – and determine which parties are potentially liable. The agency then orders the cleanup of the site or carries this out itself, with the cost then being recovered from the polluter. In most cases, these are the owners or operators of factories, shipping companies, warehouses, and waste treatment or disposal sites.

Polluters have unlimited liability for environmental damage to flora and fauna. This liability is retroactive, making operators liable for the damage that occurred before CERCLA came into force. Furthermore, the application of “joint and several liability” means that each and every one of the several polluters responsible is liable for the entire amount.

### Oil Pollution Act (OPA) 1990

The OPA was signed into law in 1990 in order to improve the nation’s ability and provide the money and resources necessary to respond to oil spills. Under the OPA the owner or operator of a facility from which oil is discharged is liable for the costs associated with the containment or cleanup of the spill and any damages resulting from the spill. However, it also created the national Oil Spill Liability Fund which is able
to provide up to one billion dollars per spill incident when the responsible party is unknown or refuses to pay. The primary source of revenue for the fund was five cents per barrel fee on domestic and imported oil but it ceased on December 31, 1994 as the clause had expired and was not renewed. Other revenue sources for the fund include interest on the fund, cost recovery from the parties responsible for the spills or any fines or civil penalties collected. Box 4 presents the related case of the Exxon Valdez spill in Alaska (USA).

Box 4 – Case of Exxon Valdez (1989) (US EPA, 1991)

On March 24th 1989, the oil tanker Exxon Valdez struck Bligh Reef in Prince William Sound, Alaska, spilling more than 11 million gallons of crude oil. The spill was the largest in US history and the size and remote location of the spill accessible only by helicopter and boat complicated the cleaning efforts.

The accident posed threats to the delicate food chain that supports Prince William Sound’s commercial fishing industry and put in danger ten million migratory shorebirds and waterfowl, hundreds of sea otters, dozens of other species, such as harbour porpoises and sea lions, and several varieties of whales.

Since the accident occurred in open navigable waters, the US Coast Guard’s (USCG) On-Scene Coordinator had authority for all activities related to the cleanup effort. A USCG investigator, along with a representative from the Alaska Department of Environmental Conservation, visited the scene of the incident to assess the damage. Sensitive environments were identified according to degree of cleanup and ranked for their priority for cleanup. Seal pupping locations and fish hatcheries were given the highest importance and special cleaning techniques were approved for these areas. Nevertheless, wildlife rescue was slow because adequate resources for this task did not reach the accident scene quickly enough and many birds and mammals died through direct contact with oil.

Alyeska, the association that represents seven oil companies which operate in Valdez, including Exxon, first assumed responsibility for the cleanup, in accordance with the area’s contingency planning.

Exxon Corporation and Exxon Shipping agreed in 1991 to settle all federal and state civil claims resulting from the oil spill by the payment of $900 million in damages and a potential additional $100 million for natural resources damages not currently foreseen. To date, ExxonMobil has faced to a liability that amounted to €5 billion in total.

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9 Marine accidents, such as the one of Exxon Valdez, are excluded from the ELD.
Small Business Liability Relief and Brownfields Revitalization Act 2002

A brownfield is considered as a property whose expansion, redevelopment or reuse may be complicated by the presence or potential presence of a hazardous substance, pollutant or contaminant. It is estimated that there are more than 450,000 brownfields in the US and that the cleaning and reinvesting in these properties could increase local tax bases, facilitate job growth, utilise existing infrastructure, take development pressure off of undeveloped open land and both improve and protect the environment.

On January 11th 2002, the Small Business Liability and Brownfields Revitalization Act was signed amending the CERCLA by providing funds to assess and clean up brownfields and enhancing state response programs. The Brownfields program is designed to empower states, communities and other stakeholders in economic development to work together to prevent, assess, safely clean up, and sustainably reuse brownfields. It provides direct funding for brownfields assessment and cleanup through grants (US EPA, 2007):

- **Assessment Grants:** They provide funding for inventory and assessment of brownfield sites. An eligible entity can apply for up to $200,000 to assess a site contaminated by hazardous substances (a waiver can be requested to set the limit up to $350,000)

- **Cleanup Grants:** They provide funding for carrying out cleanup activities at Brownfield sites. An eligible entity can be granted up to $200,000 per site, cannot apply for funding at more than five sites and will be required a 20 percent cost share in the form of a contribution of money, labour, material or services.

4.6.2. **EXAMPLES OF PRACTICE IN DIFFERENT STATES OF THE USA**

This section presents the specific relevant legislation existing in some States in the USA establishing environmental liability and the related financial security provisions.

- **Massachusetts**

  1. **Massachusetts Contingency Pan (Abelson, 1999)**

In 1983, the Massachusetts equivalent Law of CERCLA was enacted in response to the public’s demand that the state address the cleanup of oil and hazardous material disposal sites. Nevertheless, the state was not provided with enough resources so that an important backlog a cases developed and only sites with significant contamination issues could get the attention of the Massachusetts Department of Environmental Protection (MassDEP).

As a response to this issue, the Massachusetts Contingency Plan (MCP) was enacted in 1993 with the aim of privatising the waste cleanup program as the government did not have the resources to address every site. An independent Board of Registration was created which granted licenses to professional organisations called Licensed Site
Professionals (LSP) which were entitled to issuing opinions and recommendations regarding cleanups. As a result, many more sites were moving through the system, private parties had the ability to affect and in some cases control the timing of the relevant work so that the backlog of sites reduced dramatically and MassDEP was able to focus on the most significant sites.

The MCP also contributed to a better management of the previous Massachusetts waste site cleanup program by setting reportable concentrations and reportable quantities for a long list of hazardous materials and types of oils so that only hazardous sites came into the decontamination process. Moreover, the MCP includes several incentives to take early actions for example by using fees that only apply after specified time periods have run urging that appropriate action were undertaken before those time periods so as to avoid the need to pay the otherwise applicable fee.

Nevertheless, the MCP was not entirely perfect and a number of improvements still remain possible. First of all, LSPs have been given much responsibility and there is now a tension between private parties that feel that they are too much conservative in their decision making and that the associated costs are not necessarily appropriate and DEP that feels that LSPs are not conservative enough. In addition, the regulations has become increasingly complex and change frequently resulting in an increase in consulting costs endured by property owners for LSPs and attorneys.

2. Massachusetts Brownfields Legislation

Massachusetts Brownfields legislation was enacted on August 1998 after years of debate. It intended to encourage the redevelopment of brownfields through liability reforms and financial assistance. The legislation makes possible more deals involving contaminated property especially when combined with other risk reduction techniques such as environmental insurance.

- Liability provisions

Different types of parties have been provided specific liability protection so as to encourage them to take on Brownfield sites. They include Eligible Persons (defined as owners or operators who did not cause the relevant release and did not own or operate the site at the time of the release), Eligible Tenants (defined as persons who acquire occupancy, possession or control of a site after a release has been reported to MassDEP and who did not cause or contribute to the release) and Secured Lenders (defined as lenders that did not cause or contribute to a release or make it worse in some manner).

- Financing provisions

The new legislation creates three ways of providing funding for Brownfield sites:

- **Redevelopment Access to Capital Program**: This program is intended to encourage private sector lending on contaminated sites. Private sector loans for MCP response actions will be backed by environmental insurance used to pay unanticipated costs. The insurance is backed by the
Redevelopment Access to Capital Fund for which $15,000,000 has been appropriated. One idea behind the program is that the insurance will be inexpensive if a large enough pool is assembled.

- **Brownfields Redevelopment Fund**: This fund has been created and funded with $30,000,000 to provide targeted financial assistance for site assessments and cleanups in *economically distressed areas*. The applicant must be an Eligible Person and projects are subject to a $500,000 limit for cleanups and $50,000 limit for site assessment work. Both grants and loans are available, grants being available only to municipalities, redevelopment authorities, community development corporations and the like.

- **Tax Credits**: They are offered to Eligible Parties and apply for cleanup costs for properties in so-called *economically distressed areas*. The credit is for a maximum of 50% of these costs.

**Georgia (Tobin, 2005)**

The Georgia Brownfields legislation was implemented through the Georgia Hazardous Site Reuse and Redevelopment Act which was amended in 2002 and the Brownfields Tax Incentive Law which was enacted in 2003. The Georgia definition for Brownfields excluded contamination from petroleum releases contrarily to the federal definition which is more general and deals with the presence of a hazardous substance, pollutant or contaminant.

Georgia has developed two different types of incentives through liability limitation and taxes.

- **Liability limitation**
  
  Liability for the cost of groundwater cleanup and for third party claims (lawsuits) arising from the contamination is limited under Georgia’s Brownfields Program. By buying a contaminated property, the buyer will typically assume responsibility for site investigation (soil and groundwater), soil and source material cleanup and the compliance status report but he will not become responsible for groundwater cleanup and cannot be sued for issues resulting from prior groundwater contamination. The liability for groundwater cleanup will remain with the seller.

- **Tax incentive**
  
  The new owner of a Brownfield can apply to the local taxing authority for preferential tax assessment for the first 10 years or until the investigation and cleanup costs are recouped.

**4.6.3. US ENVIRONMENTAL INSURANCE MARKET**

Since the 1970s, the US environmental laws (Superfund and the Resource Conservation and Recovery Act) hold businesses responsible for the cost of cleaning up polluted sites. Nevertheless, the need for environmental protection only became apparent in
the mid eighties when insurers incorporated absolute pollution exclusions into general liability policies (Freeman, na).

First of all, given the general lack of information about the frequency and severity of expected losses, the insurance industry responded to pollution exposure by offering expensive and narrowly tailored policies that required extensive environmental engineering inspections for each site. Then, over time, insurers have been able to quantify and manage pollution risks by applying technical engineering practices and analyzing the accumulation of loss data registered even if the development phase has been a trial-and-error process for some underwriters. As a result, prices for environmental coverage have dropped and demand has grown, driven by environmental legislation and exclusion of pollution from general liability policies (Freeman, na).

The market for environmental insurance has grown from $500 million in 1993 to an estimated $2 billion in 2003. Over the last decade, the growth in the market has been mainly driven by the focus on larger coverage and multiyear policies in order to address latent existing pollution or undiscovered contaminated streams.

Despite this significant growth, environmental insurance still remains a product with limited distribution to a sophisticated clientele of high-risk businesses, real-estate developers and mortgage lenders. It plays a particular role in real-estate transactions by reducing uncertainty for buyers, sellers, lenders and investors. This view of the environmental coverage as a sophisticated product does not reflect today's reality of environmental risk which can also affect local manufacturers and small and mid-size businesses. Some insurers are now starting to offer pollution products that focus on the needs of SMEs including products that combine pollution with other casualty coverage.

In response to increasing environmental concern and regulation, businesses have adopted more formalised environmental management procedures but only the largest businesses have opted to retain the risk from environmental exposure because of the enormous costs involved in cleaning up a contaminated property.

Government benefit programs play a role in managing environmental risk. They provide benefits to individuals and businesses that suffer losses but they do nothing to lower the risk and likelihood of loss and they subsidise certain businesses at the expense of all taxpayers (Freeman, na).

4.6.4. **FINANCIAL SECURITY PRODUCTS IN THE US**

- **Environmental insurance schemes**

The environmental insurance market has created various types of environmental insurance products to address the needs of the insurance buyer. Companies now have the ability to insure both known and unknown liabilities associated with historical and future obligations as well as contractual obligations.

The basic coverage forms currently offered in the US are:
1. Site specific EIL - Over the years the site specific policies have been modified to apply to specific risks. For example, underground storage tank (UST) insurance is a modified version of the site specific policy. The UST policy was created to address the financial responsibility requirements that owners and operators of UST are required to meet under the Resource Conservation and Recovery Act. This policy covers third-party claims for bodily injury, property damage, cleanup costs and legal defence costs caused by contamination emanating from the UST.

2. Another type of site-specific policy is real estate transaction insurance. Various insurance forms exist that protect real estate investors, property owners, banks and others involved in buying, selling, or managing property that protects their interest in the event of a pollution claim.

3. Contractors Pollution Legal Liability (CPL) policy provides coverage for bodily injury, property damage, cleanup costs and legal defence expenses arising from the operations and completed operations of the contractor.

4. Environmental professional errors and omissions liability insurance (Environmental E&O) provides coverage for personal injury, property damage, cleanup costs, and legal defence expenses resulting from negligence in the performance of the contractor's professional services.

5. Remediation Stop Loss, also known as Cost Cap Coverage, is designed to insure that the remediation costs to the insured do not exceed the anticipated cost. The coverage pays remediation expenses when the costs overrun the estimates and the deductible of the policy.

Significant capacity (most of the major markets offer $100m per loss or more at a single transaction), broad policy terms and conditions, aggressive pricing, multi-year policy terms, and expert underwriters characterise the US environmental insurance market.

Evolution of the US environmental insurance market

In the mid-1970s, a limited environmental insurance market started to form. The rigorous enforcement of environmental laws in the US and the need for financial security instruments for owners and operators of hazardous waste disposal facilities created a ready market for environmental insurance. Indeed, main drivers of such development were (Fogleman, 2005):

1. Environmental liabilities had substantially increased since 1970.
2. The withdrawal of cover for environmental risk in commercial general liability (CGL) and other general liability policies
3. A demand for environmental insurance policies in commercial transactions
4. Newly introduced financial responsibility requirements
5. Increase in the programmes to redevelop brownfield sites.
By the mid-1980s, however, the claims made on the basis of CERCLA (in heavily contaminated “Superfund” sites) created large losses for the insurance companies, to the extent that the market for environmental insurances was close to a break-down. The increased exposure to claims led, in turn, to adverse claim experience sue, mainly, to a failure on the part on some insurers to adequately evaluate environmental risks during the underwriting process and a withdrawal of reinsurance cover for environmental liabilities (Fogleman, 2005). Indeed, the cost for re-insurance increased considerably, leading to the fact that it was difficult to find re-insurers willing to accept these emerging exposures (Zagaski, 1991).

Strict underwriting guidelines, restricted coverage and significant premiums caused many companies to self-insure their environmental exposures.

In the late 1980s, the growth of the environmental insurance market was mainly due to an increase in lines of coverage rather than capacity. By the end of the 1980s, environmental insurance policies were available for environmental consultants, clean-up and contractors, treatment, storage and disposal (TSD) facilities and operational risks at an insured facility on a site specific basis (Fogleman, 2005).

Site-specific policies were introduced to cover first-party clean-up costs arising from pollution incidents occurring in the insured site. The growth in policies for environmental consultants was driven by the large number of environmental consultants whose clients required them to have covered for errors and omissions. Another element that greatly impacted the growth of the demand for environmental professional errors and omissions liability insurance was the case United States v. Maryland Bank & Trust, 632 F. Supp.573 (D. Md. 1986). In this case, a bank was held liable as owner under CERCLA for the cost of cleaning up contamination on a borrower’s far. The bank had indeed foreclosed the farm and own it for four and a half years during which time the EAP had cleaned up the contamination that had been found. This case, that was very polemic and commented at that time, led to an increased demand for environmental due diligence in commercial transactions from financial institutions (Fogleman, 2005).

During the early 1990s, the market experienced an important growth for contractor policies while site-specific policies suffered a slow-down. The main reason for such lack of demand for site-specific policies was the underwriting approached taken in those days. In general, insurers would not provide cover until an environmental consultant appointed by them, would conduct a detailed environmental assessment of the sites to be covered by the policy (Fogleman, 2005).

By the mid 1990s, the environmental market began to expand both regarding capacity and the coverage lines as more insurers entered it. Also, the demand for policies to provide protection to parties in commercial transactions for liabilities from past pollution incidents increased due to the increase in mergers and acquisitions. By then, insurers had reduced the length of the underwriting process and were offering more flexible policies (Fogleman, 2005). Indeed, the maturing of the market produced comprehensive loss data allowing insurers and re-insurers to gain a better
understanding of the financial risks involved. These factors, together with the increased competition, contributed to reduce the premiums of between 25 and 30%. Also, the types of coverage the marketplace offered grew dramatically and various alternative risk products emerged.

The International Risk Management Institute (IRMI) has also identified a number of trends that fuel the growth of the US environmental insurance industry, most importantly the increased public awareness of environmental issues. Other significant developments include:

- The consolidation and down scaling of the operations of the Department of Defence and the utility deregulation within the Department of Energy has led to privatisation of contaminated governmental properties. Recent legislative changes have made it possible for redevelopment authorities to take title to the site before a clean-up is completed.

- Environmental risks typically crystallise during transactions where either the buyer or seller is unwilling to take responsibility for potential environmental liabilities. Investors have become more familiar with environmental risk transfer programs to resolve environmental liability issues during mergers and acquisitions.

- It has been made clear that in certain situations bank lenders could be held liable for pollution conditions at properties to which they are tied to by a loan or other financial agreements. As a result, lenders have become more careful with transactions that involve potentially contaminated property. In absence of legal relief from such liability, lenders have turned to environmental insurance. Creditors can acquire coverage to pay either an outstanding loan balance or the cost of cleaning up the property.

By the early 2000s, the environmental insurance market started to harden, with increased premiums for EIL policies, clean-up costs cap policies increased, and reduced policy periods. The main reasons for such changes were adverse claim experiences.

**Alternatives to environmental insurance schemes**

Traditionally in the US, businesses and other organisations have handled risk by transferring it to an insurance company through the purchase of an insurance policy or, alternatively, by retaining the risk and allocating funds to meet expected losses through an arrangement known as "self-insurance". When businesses had trouble obtaining some types of commercial insurance coverage, new mechanisms for transferring risk developed, facilitated by the passage of the Product Liability Risk Retention Act of 1981. These so-called ART arrangements blend risk transfer and risk retention mechanisms and, together with self insurance, form an alternative market. The commercial insurance market often becomes more familiar with a new financial security product through coverage via ART products. Since the late 1990s, asbestos claims have been on the rise, which in turn has created a demand for ART mechanisms.
in the US, due to large workers compensations claims (which are paid by the industries). Captives are a special type of insurance company set up by a parent company, trade association or group of companies to insure the risks of its owner or owners. The first captive solutions date back to the 1950s. Captives and risk retention groups — in which entities in a common industry join together to provide members with liability insurance — were the first ART mechanisms to appear. Other options, including risk retention pools and large deductible plans, a form of self-insurance, followed.

Alternative market mechanisms cover about 30 percent of the US commercial market, with traditional insurance companies covering the remaining 70 percent, according to a September 2006 report by Conning Research & Consulting. Self-insurance is the leading alternative mechanism (with about 75 percent of the total US alternative market (Swiss Re, 2003), followed by captives. This report estimates that the two mechanisms account for 90 percent of the alternative market in the US. Captives are at present global phenomena, but regulation-driven self-insurance and risk retention groups are so far US-specific products. Risks associated with properties and workers’ compensations are by law not allowed to be handled by risk retention groups.

Common scopes of coverage of US self-insurance, on the other hand, include worker’s compensation, properties, general liability, product liability, and auto-liability. To receive self-insured status, companies must qualify through application processes, meet specific financial requirements, and be approved by a supervising authority. A qualified self-insured is usually required to cover losses through cash settlements, bonds or letters of credits.

The general use of captives by corporations has grown exponentially during the last 30 years in the US. In 2006, the US had most captive domiciles in the world (followed by Bermuda). Almost 40 per cent of the captives were formed to handle medical malpractice suits, with less than 10 per cent designed for financial security for environmental liability.

In February 2008, the Internal Revenue Service (IRS) withdrew a proposed rule that would have removed favourable tax treatment for companies that use a captive to cover the risks of their corporate affiliates. The proposed rule would have affected hundreds of captives and removed a key tax break for captive sponsors. Historically, large tax breaks were key incentives for corporations to engage in setting up captives (Hannah, 2000).

4.6.5. **COMPARISON OF FINANCIAL SECURITY MARKET IN USA AND EU**

The US environmental financial security market differs from the European market in several ways.

An important aspect to take into account is the difference in the legal framework. For example, in the US, there is more stringent and extensive brownfield remediation programmes, the environmental liability legislation applies unlimited retroactive
liability, and the legislation is generally enforced to a larger degree than in most European MS.

The environmental liability regulation in the US has financial security requirements for a large range of activities that bear high risks of causing significant environmental damage (e.g. the Superfund programme, which is usually compared to the ELD, requires owners and operators of certain facilities to have financial security). This has been a major driver in the US environmental insurance market. Activities subject to financial security requirements in the US include, for example, the ownership and operation of underground storage tanks (USTs), hazardous waste disposal sites and dry cleaners. Insurance policies providing cover to fulfil the financial responsibility requirements must often meet detailed criteria that are specified in regulations. Exclusions are generally limited and cancellation provisions are restrictive. The actual evidence of financial responsibility is generally a certificate that states that coverage is provided by the policy (Fogleman, 2005).

The market in the USA is influenced by the joint and several approach taken by the authorities, who will pursue any entity that may have some connection with the property that is the centre of the pollution claim. In other words, any responsible party can be either fully or only partially liable for the cleanup costs regardless of their contribution to the environmental problem. The consequence of this approach is that the environmental liability products are more widely demanded as this approach increases the probability of being liable to pay. In the EU, the MS can decide whether or not liability should be joint and several, or proportional. Moreover, a broad definition of biodiversity is defined in the legislation while the ELD refers only to the protected species and natural habitats covered by the Birds and Habitats Directives. On the other hand, the types of liability regimes applicable to operators and the damages that are covered are more precisely defined in the case of the ELD.

Furthermore, in the US, there is a culture of large claims and a different operative mode in the justice courts (e.g. a compromise may be more possible in the US justice system than in the European).

In the US, different financial security instruments have been available for quite some time now, thus the market is more mature and insurers and insureds have a longer experience with the development, commercialisation, and application of different environmental financial security solutions. In the beginning, the insurance industry offered expensive and narrowly tailored policies that required extensive environmental engineering inspections for each site given the general lack of information about the frequency and severity of expected losses. Then, over time, insurers have been able to quantify and manage pollution and more statistical information on potential losses is now available. Indeed, there are now computer programmes that allow the Department of Interior and different States’ environmental agencies to estimate the cost of damages. Furthermore, there is now a lot of experience regarding compensatory and complementary remediation (Fogleman, 2008 b). On the other hand, as indicated before, it is observed that higher-than-expected losses on certain
long-term products, a lack of support for reinsurers and acknowledgement that there are unknowns in long-term insurance cover have led to a tightening of terms and conditions, and more standardisation in the products offered.

While insurance is the most prominent mechanism, there is a wide variety of mechanisms including corporate financial guarantees, bonds and governmental schemes such as state bond pools. Indeed, as mentioned before, ART, which are regulated and accepted, cover about 30 percent of the US commercial market. There is specific and strict legislation that sets the framework for a number of ART options – self-insurance, captives and risk retention groups. Furthermore, there are certain tax incentives for users of captives in the US.
5. OPERATORS RELATED ISSUES

As the market for ELD insurance products is a free one, the demand side (operators) needs to be looked at in parallel with the supply side (insurers) in order to evaluate the current situation as well as future potential. In this regard, it is important to highlight that the term ‘operators’ includes a very large number of companies active in different industrial sectors spread across Europe and of different sizes, from SMEs to large industrial multinationals.

5.1. AWARENESS ON ENVIRONMENTAL LIABILITIES

One of the main aspects is the level of awareness among operators regarding their liabilities under the ELD. It should be remembered that while there is a degree of uncertainty among insurers regarding how the Directive will work in practice, the same sense of uncertainty seems to exist for operators in terms of their liabilities and the extent of coverage available for their liabilities. Indeed, the results from the operator interviews\(^\text{10}\) show that among the limited number of operators surveyed, none had actually adapted their insurance policies to cover the extended liability induced by ELD. Some of them were even not aware of the existence of the ELD or the specific national transposing law. This suggests that the transposition of ELD still needs to be communicated to a wide range of operators and to the major players in the field.

The most common reasons mentioned for not reacting upon the extended liability included:

- The ELD is very new and not enough information exists.
- Their current insurance provider has not provided them with information or informed them that they needed to take action, for example in the yearly evaluation.
- The companies were active in a relatively low-risk sector with limited potential damages.
- Polluter-Pays-Principle already integrated in national legislation and they abide such legislation.
- The recognition that the extended liability did not impose any substantial higher risk and, therefore, did not consider necessary to take actions.

Of the operators perceiving no higher risk, some said that what could make them change this perception would be an actual incident with substantial claims. Indeed, during meetings with an insurance broker, it was highlighted that, based on experience, reaction from operators might not be observed until such pollution event

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\(^{10}\) Please note that the interviews represent a very small sample at the EU level (10 interviews in Sweden, Denmark, Germany, UK and Italy).
occur, illustrating the potential exposures and the losses. In general, most operators are not proactive and they rarely demand their insurance provider a revision of their current policies and information about new products. This is particularly true in the case of SMEs. Some may be aware about the risks but most do not perform analysis of their possible exposures and products needed to cover such risks.

Guidance is already available to operators to assess their liability. Frameworks for environmental due diligence exist that could be used to assess environmental liability associated with sites or organisations. These frameworks could be useful in attempting to understand the question regarding the extent of liability under the ELD. An example of such a framework is the ‘ISO 14015:2001 on Environmental Management - Environmental Assessment of Sites and Organisations (EASO)’, which provides guidance on identifying environmental issues and their business consequences (CEA, 2008 a).

The recent Bartoline case (Bartoline Ltd v Royal & Sun Alliance Plc -RSA- and Health Lambert Ltd), decided in the Manchester Mercantile Court on November 30, 2006, illustrates the substantial losses than can result if companies remain unaware of the extent of the potential gaps in cover for environmental liabilities in public liability policies. In this case, damaging substances were washed into a nearby river as the fire service put out a blaze at a large chemical plant. The United Kingdom Environment Agency (UK EA) cleared up the damage and subsequently billed the company in the region of £700,000 for the emergency clean-up costs. Furthermore, the UK EA served a works notice on Bartoline to carry out further works to remove polluted water, to remediate contamination on the banks of the river and to carry out works to prevent further pollutants entering the river. Bartoline incurred £147,988 in complying with this notice (Fogleman, 2007).

In 2003, Bartoline made claims against RSA, which had issued various policies to it including a public liability policy. RSA paid some claims but denied the claims for clean-up costs on the basis that the public liability policy did not provide for such costs.

In the court case which followed, the courts ruled in favour of RSA whose policy provided that they would indemnify Bartoline against legal liability for “damages” in respect of accidental loss or damage to property. Apparently, the word “damages” did not include clean-up costs.

The Bartoline case illustrates the risks of relaying only on a public liability policy to provide cover for environmental liabilities. The information provided earlier about current awareness of operators on their environmental liabilities as well as the Bartoline case suggest that many companies are leaving themselves exposed to environmental risks by failing to properly consider what risks their current policies cover. In this regard, it would be recommendable that companies re-evaluate their approach to insurance cover in respect to environmental pollution. Those companies looking for environmental liability coverage for specific risk, such as statutory clean-up costs, should be sure that such clauses are included in their policies. Furthermore, this
case shows that it is equally important to focus on what the policy covers as well as what it excludes.

Insureds need to reconsider whether some of the current range of specific EIL insurance policies and other stand-alone ELD products provides the real protection they need (e.g. liability for clean-up costs or emergency costs). However, as showed in chapter 4, some EIL policies only offer limited cover and may not cover all the risks the client expects them to, such as asbestos, electromagnetic fields, genetically-modified organisms, and first-party employers or first-party property damage.

5.2. ELD-RELEVANT FINANCIAL SECURITY OPTIONS

Companies aware of their environmental liabilities tend to cover their risks, mainly though a mix of environmental insurance (either GTPL or EIL or other stand-alone insurance) and other financial security instruments, mainly captives, bank guarantees, warranties, and funds.

For companies having insurance policies, mainly large corporations, the main rationale was the need to out-source the administration of the claims in the event of an economic loss. Insurance is especially interesting for corporations for which environmental risks are not part of their core business. Based on the results from the interviews, very few companies are planning to get better coverage (some gaps have already been identified as in the case of coverage for gradual damages) or new insurance policies. Other companies are aware of their liabilities but claim that their insurer has not yet proposed new solutions.

Some operators have activities in more than one MS or even further afield. One of the main concerns for these companies is that they have to handle a variety of liability concepts and the fact that the law and concept of liability is varying a lot from one MS to another. Some have insurance at corporate level and prefer to arrange their insurance on an international basis rather than having a separate policy in each country. This is the case of companies mainly specialised on a specific activity. Some companies, such as SUEZ, operating in different countries in different sectors, have more general corporate insurance policies complemented with site-specific or sector specific policies, which take into account national requirements for environmental liabilities. SUEZ, for example, has two types of products. First, they have the so-called horizontal programmes, which provide worldwide coverage. In such case, they define internally the amount of insurance needed to cover the exposures to be externalised. The capacity available in the market is taken into consideration as insurers are not always capable to face all their exposures. Secondly, sector-specific coverage is used in different MS, having lower costs than the horizontal programmes.

Such large companies usually seek the assistance of a professional risk manager and they also use the services of a global broker. Together with the insurer, these large companies can adopt a tailor-made solution.
High insurance premium is the main reason for companies to look for other solutions. Different types of captives are very popular. Captives can be a cost-efficient solution for companies that have good control of their risks, since the non-claims portions of a premium paid on environmental insurance can represent as much as 30 – 40 percent (e.g. insurers acquisition costs, overhead expenses and profit margin). Low-risk companies can capture the benefit of a better than average risk profile, which the insurance market might not be able to fully recognise. Although captives can be quite expensive they also have the benefit of opening new business opportunities with high risk objects. Environmental risks are still often investigated when property is sold or bought, and it has proven very useful to make use of captives or price-reductions in these transactions (Höök, 2008).

Companies that do not find coverage for all of their risks often use forms of self-insurance, such as in the case of ExxonMobil, which has sufficient economic resources available to do so and believes that self-insurance can further reinforce and incentivise risk management. Sometimes, it is also an economic decision for companies with own risk managing capacity, nevertheless this solutions is usually not feasible from an economic point of view for SMEs. Using internal resources and ad-hoc means are less preferred as companies have to pay up-front and block money in a reserve and therefore not being able to use it.

Banks guarantees are perceived by some operators and stakeholders as a not very viable option as banks are often not very keen to cover long terms risks.

5.3. RISK MANAGEMENT

Risk management requires an understanding of both probability and severity through the operators’ ability to prevent incidents occurring but also their ability to contain releases from a given site in case of an accident. In broad terms, there should be an indirect correlation between the level of risk management and the potential to incur ELD: as the level of risk management improves, the probability of an event occurring reduces, and vice versa.

Few companies declared to perform regular risk assessments (e.g. ExxonMobil and SUEZ).

Again, best guidance on how to identify and manage risks is available through the ‘Seveso II’ and ‘IPPC’ schemes, and the related SHAPE-RISK programme coordinated by the French National Institute of Industrial Environment and Risks (Institut National de l’Environnement Industriel et des Risques - INERIS)\textsuperscript{11} on behalf of the European Commission, which acts as a knowledge-sharing forum in the health, safety and environment fields.

\textsuperscript{11} INERIS is a public industrial and commercial establishment under the supervision of the French Ministry of Ecology and Sustainable planning and Development.
In spite of the high risk nature and expanding range of environmental liabilities, a surprising number of companies are negligent about managing these risks. In a recent survey of 320 business executives around the world, 43% of the respondents indicated that environmental risk management is frequently handled in an ad hoc fashion or not at all. Only 41% said they conducted environmental assessments when developing new products or services; 26% when planning geographical expansions, and only 19% when planning mergers and acquisitions. The survey also suggested that if environmental risk management activities are to be successful, they must be considered as part of the company's overall risk management strategy and not managed as a separate process only when problems arise. The takeaway here is that while environmental liabilities are rising up the corporate agenda, many companies are still at the early stages of this process (Allen, 2008).

Given the nature and extent of the risks, companies should be proactive in managing their environmental liabilities. There are three fundamental or basic steps in managing environmental liabilities that are briefly described below:

- **First step:** Periodic review or inventory and a preliminary assessment of the company's current and foreseeable environmental liabilities. This step is likely be done by a company's risk manager with input from in-house counsel and/or in-house corporate financial or accounting managers. A company might also want to consider seeking outside expertise from environmental consultants and legal counsel to assist in this step for the sake of completeness and thoroughness.

- **Second step:** Quantification and analysis of how the environmental liabilities identified during the first step might impact a company financially, legally and commercially. At this point, a company might want to supplement its own resources with outside expertise from environmental consultants and legal counsel (if not consulted in the first step), as well as from actuarial experts, outside accounting experts or other financial analysts.

- **Third step:** Development of a strategy for managing the environmental liabilities. Ideally, this strategy would be consistent with if not an integral part of the company's overall risk management program. A company seeking to manage its environmental liabilities through an insurance portfolio would want to supplement its team of aforementioned experts with insurance professionals including forensic insurance experts who could identify and evaluate the company's historical insurance coverage, and insurance brokers who could assist the company in identifying and acquiring the right insurance products to complete the needs-coverage matrix.

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12 *Under the spotlight: the transition of environmental risk management*. March, 2008. The Economist Intelligence Unit (EIU). The EIU surveyed respondents from a wide range of industries in Asia, Australasia, North American and Western Europe. About half of the respondents represent businesses with annual revenue of more than US$500 million. All of the respondents influence or are responsible for strategic decision making concerning risks at their companies.
6. GAPS, LIMITATIONS, AND POSSIBLE SOLUTIONS

6.1. BARRIERS FOR PRODUCT AND MARKET DEVELOPMENT

- Lack of data availability on frequency and extent of the losses

Traditional insurance system is based on the assumption that risk is quantifiable, in order to define the right premium. However, insurance for environmental risks represents many difficulties for the insurance market (De Smedt, 2007).

Insurance is only able to perform its function correctly if certain amount of information on the probability and possible extent of the damage of a certain risk is available. Precisely, this information concerning environmental risk includes several factors of uncertainty, both factual and legal. ELD contains new concepts like complementary and compensatory remediation. The so-called gradual pollution poses a special difficulty as it develops slowly over a long period of time and its damaging effects are only apparent in the long run. Therefore, in this case, it is very difficult to determine when pollution began and how long it continued. Moreover, it is complex to identify single polluters responsible for the damages.

The lack of available data on frequency and extent of the losses, and the fact that in general there are not track record of how cases of damage are addressed (although data on past damage is available) might result, at least in the beginning, in expensive products, which are unlikely to be attractive for smaller companies. This lack of knowledge was mentioned as one of the most limiting factors for further market development by several MS such as France, Spain, and Slovakia.

- Lack of experience among insurers in dealing with environmental liabilities

Being a new area of liability, there is no experience of underwriting and claims management, and it can be a very time consuming process. All the insurers that participated in the survey, except UNIQA Hungary, described the ELD product development process as time consuming. Most of the MS that participated in the survey agreed on the fact that the little experience of operators in the field of environmental liability represents one of the key factors hindering the further development of the environmental insurance market. Indeed, European-based insurers have little experience in dealing with environmental liabilities, and only a few could underwrite on a scheme basis, with a dedicated team (mainly American insurers or companies with a prior experience gained in the USA).

In the context of liability claims, insurers have experience mainly in the area of what might be called “traditional damage”, meaning bodily injury, damage to property and pure economic loss. The ELD does, however, introduce remedial measures for which the industry has very little experience and therefore new claims management skills will
be needed. Legal uncertainty is only perceived as a main obstacle by the Netherlands, Czech Republic, and France.

Furthermore, as far as natural resource damage is concerned, an additional problem lies in the fact that generally accepted measurement techniques to quantify environmental damage are lacking (Faure and Grineaud, 2000). If there is uncertainty, because of a lack of reliable statistics, this should not necessarily lead to the conclusion that a particular risk is uninsurable. As long as the lack of data and risk assessment models as well as the incapability of measuring potential losses persist, the insurers will be reluctant to extend their coverage.

Another problem is that, due to the current difficulties for insurers to differentiate between high risk and low risk clients, and the lack of methodology for defining premiums, the insurer could base the insurance premium on the average risk across all firms, thus having the high risk companies purchasing a more than proportionate share of insurance and the insurer experiencing losses, because he could not rightly assess the probability of the risk. Partner Reinsurance argues that in the absence of an adequate rating model for insurance premium, some insurers provide cover for ELD-related losses almost for free. This is due to the fact that the insurance premium charged to the insureds might be low in relation to the exposure.

These observations are in line with the limitations for development of more far-reaching products highlighted by the industry in the responses to the questionnaire. Indeed, the lack of coverage for gradual pollution and compensatory remediation and the potential overlap with other insurance products are perceived by the insurers the most persisting limitations for the developing more far-reaching products, as illustrated in Figure 9. The lack of clarity at the national level and the long timeline in environmental damage cases were also identified as barriers.

- **Poor communication about ELD and related financial security products**

As often happens on a free market, it is a question of demand and supply and even though insurers might be cautious, they are also not being encouraged to develop new insurance products more quickly as operators are often not aware of their new responsibilities and risks and therefore do not demand products to cover their risks, as discussed in chapter 5. Other obstacles that have been mentioned include the limited economical capacity of certain operators to afford an insurance product, particularly SMEs, which in turn slow down the increase of the demand for insurance products.
Another actor that hinders the stimulation of this demand by the insurance industry itself is the broker: during meetings with various insurers it was highlighted that brokers are not always aware of the ELD and the new exposures of their clients (with the recent transposition of the Directive in most MS and the new market for environmental liability insurance), and in those cases where they are, brokers are more comfortable in selling standard products that they have worked with over a long period of time instead of new products that they are less familiar with. On the other hand, it has also been suggested by a broker that in general, insurers are not always proactive in selling their products and in informing brokers about their new environmental products.

Further development of the environmental insurance market is therefore not only a question of the willingness of insurers to develop new products but also one of informing and educating clients, brokers, and other stakeholders.

**Variations in the transposition across Europe**

Another important aspect relevant for product development is the fact that the specific legal framework for environmental liability varies across Europe, which in some cases could hinder the development of certain insurance solutions targeted for companies with subsidiaries in different countries (this issue was raised by MS such as Sweden, operators and the industry during the stakeholder consultation). This element does not seem to be such a pressing limitation for market development. As discussed in section 4.4.1 and chapter 5, there are already products that can be arranged on an international basis and most insurers offer products open to operators active in other EU countries (only 30% of the insurers that participated in the survey answered that their products are limited to operations in their home country). This raises the question of whether site-specific insurance products are better than general Pan-European insurance products to face environmental liabilities. Undeniably, site-specific products
(mainly EIL and stand-alone products) allow a better consideration of specific risks that are defined through careful evaluation and classification of the risk that allows for imposing technical safety standards to the insured. The suitability of one or the other product will mainly be driven by the needs of the operators. Operators carrying out different activities and operating in different MS, it will be better to combine products providing worldwide coverage and products providing sector-specific or site-specific coverage, which will have lower costs than the general programmes.

This wide variety of regimes regarding environmental liability could also cause issues in case of a transboundary environmental damage. The question would be which regime will the counting one if they differ in strictness; which authorities will have the final say about remediation measures and which criteria are going to apply when it comes to defining the objectives of the remediation measures. Nevertheless, as commented in section 4.4.1, most companies do cover cross-border damage, however some introduce exceptions in this regard. For example, VICTORIA Versicherung AG does not cover transboundary shipment and control of shipments of waste within, into or outside of the EU.

6.2. POSSIBLE SOLUTIONS

- Guidance for better understanding the ELD

Work is under progress in some countries in order to develop guidance either for operators or for insurers to deal with financial security aspects in ELD.

Germany carried out several R&D projects leading to a better understanding of the ELD and transposing acts. The outcomes of the projects have been discussed with the GDV to inform about the legal framework of environmental liability and help insurers to work out guidelines themselves. This cooperation concluded in general insurance conditions issued by the GDV.

In the United Kingdom, insurance companies have their own internal guidelines and methodologies for designing insurance products but they are not generally available guidelines. There is also guidance (currently a draft) by the Government on the transposition of the ELD including information on how to assess damage and remedial measures.

- Methodology for estimating costs of environmental damages

As highlighted by some MS as Poland, Spain, and France, it is necessary to establish a specific methodology to estimate costs of environmental damages so that it is possible to estimate risks (as commented in the section 6.1, the lack of knowledge about how to estimate risk and assess damages is one of the main barriers for further market development as identified by insurers). MS such as France or Spain are currently developing such guidelines on how to calculate compensatory remediation or to assess nature resources damages.
The French authorities are currently working on a damage assessment methodology and some prospective surveys are currently being carried out with French and international insurers, mainly focusing on offset mechanisms linked to habitat banking. One study on the economic analysis of environmental damages of industrial pollution events has recently been published (working paper “Evaluation économique des dommages environnementaux sur les accidents industriels” by M. Yann Rousseau) (Letrémy, 2008).

In Bulgaria, there is not a specially developed guideline for the estimation of compensatory remediation under ELD, but there is a guideline, approved by the Minister of Environment and Water, for the estimation of remediation measures of past environmental damages, caused by the state owned enterprises before privatisation.

In Poland, the Ministry of Environment is in the process of commissioning a study entitled “Methods of estimating costs of damages to environment” with information available for the calculations relevant to the ELD.

To estimate the value of the damages two approaches are predominantly applied to date (REMEDE, 2007):

- **Monetary valuation (value-to-cost) approach**: Determining the monetary value of the damages. The value of the loss is used to define the scope of remediation needed to complement and compensate for the damage.

- **Resource equivalency approaches**: Calculating the amount of natural resource remediation or restoration needed to compensate for the harm. When this approach is used, the benefits of remediation projects are scaled to be equivalent to the damage.

The ELD states a preference for resource equivalency approaches over monetary valuation. Annex II stipulates that a value-to-cost approach can be used (at the discretion of MS) when it is not possible to use a resource equivalency method.

Three main approaches to resource equivalency commonly applied are: service-to-service, resource-to-resource, and value-to-value approaches. The objective of each of these methods is to determine the appropriate amount of complementary and/or compensatory remediation necessary to fully compensate the public for an environmental damage.

The result of an equivalency analysis can be expressed in monetary units, area of required remediation, numbers of individual organisms that must be replaced (such as fish or birds), or units of recreational use, such as user-days that must be replaced to compensate for the loss of recreational use.

The method initially developed to implement the service-to-service approach is called habitat equivalency analysis (HEA). By scaling remediation based on units of habitat rather than money, the services provided by habitats (which can include human use and ecosystem services) can be adequately replaced, regardless of the cost of the
replacement. As the use of HEA expanded, cases arose where the damage was more appropriately measured in numbers of individuals lost, such as birds or fish, than in habitat units. In such cases, the remediation was scaled to provide equivalent numbers of replacement individuals, on the theory that the replaced individuals would compensate for the full suite of ecological and human use services lost. This application of resource-to-resource scaling came to be called resource equivalency analysis (REA). The methods of REA are fundamentally the same as for HEA, but the units of quantification differ.

The HEA and REA are considered to be appropriate for scaling remediation when

- a common metric can be defined that reflects the services damaged by the impacts and gained through remediation,
- the landscape context of the damaged and remediated habitats are sufficiently similar that the remediation will supply similar services,
- sufficient data on HEA/REA input parameters exist or are cost-effective to collect.

In general, more detailed information regarding the estimation and remediation of environmental damage is available at the European level especially in the context of the REMEDE project (see Box 5).

- **Information exchange**

Like in most emerging markets, experience and knowledge in new methodologies and legislation will spur demand for new products. In this regard, knowledge of preceding pollution events and about potential claims would contribute to increase confidence of underwriters, which in turn will likely result in increased market capacity, broader scope of covers and further innovation in claims management.

In this context, it is crucial to gather and exchange information (as proposed by Belgium, Bulgaria, Slovakia and Germany) and experience between insurance companies, operators, and brokers. By doing this, and taking into consideration practical experience, it should be possible to create the necessary underwriting capacity. As for data availability, it is important to consider that future experience will help, but also the possibility of exchanging joint calculations and studies under the current exceptions to the application of competition rules established in the insurance Block Exemption Regulation. To deal with the problem of data availability, some insurers (e.g. Victoria, Allianz, AXA, Generali-Providencia and Partner Reinsurance) are doing active loss monitoring and gathering data from claims.
Box 5 - The REMEDE project (REMEDE, 2008)

The REMEDE project is designed to support Annex II of the Directive, which lists different methodologies that can be used for this common framework.

The goal of the REMEDE project is to develop, test, and disseminate methods for determining the scale of the remedial measures necessary to adequately offset environmental damage, and to produce a toolkit to assist public authorities and other stakeholders in applying the ELD. The project draws from both US experience, in terms of methodological developments and implementation issues encountered, and experience of the EU MS.

The first draft of the toolkit was tested and further developed through case studies in Spain, Poland and elsewhere in the EU. In particular, the toolkit articulates the steps of resource equivalency analysis in the context of the ELD, the Habitats and Wild Birds Directives and Environmental IA Directive (Lipton, 2008). In particular it establishes, describes and discuss the following steps:

- Initial Evaluation
- Quantify Debits
- Quantify Credits
- Scale Remediation
- Monitoring & Reporting

For more information on the REMEDE project, the toolkit and the case studies: http://www.envliability.eu/

In order to face the unavailability of data necessary for risk evaluation, the lack of experience on handling and evaluation of claims, it would be useful to create a compilation recent events under ELD (case studies) to illustrate how implementation works in practice and the performance of the available financial security products. In this regard, CEA has just started collecting cases which have occurred since April 30th in different MS and that are publicly available. Regarding the information that is and will be available for the case studies, it is important to take into consideration the following aspects (Tettamanti, 2008 b):

- Reliable sources

  The best and most reliable sources to get the most accurate data on losses and incidents are the national competent authorities. They should have these data on incidents from a very early stage. It is often later before the insurance

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13 Equivalency analysis enables calculation of the amount of habitat/resource to be created or enhanced to provide the same level of natural resources or services over time as were damaged.
industry becomes involved or obtains much more detailed information. NAs could also be a reliable source of information.

- Timescale

A thorough preparation of a claim like the "Donges river" case (see Box 7) takes time. It might be 10 years or even more before any real views can be formed and before the effectiveness of financial security instruments become clear. For most of the recent cases, available information mainly related to primary remediation, for which insurance has been available already for some time.

- Prudent approach

Based on the public information available for different events, it is important to bear in mind that these information are not complete and do not reflect the actual loss situation in a given MS. The remediation considered under the ELD takes a long term view especially with regard to complementary/compensatory remediation. It is still too early to consider the recent events in the functioning of financial security instruments.

During the workshop organised in the framework of this study in June 2008, several participants highlighted that it would be helpful to have this type of case studies in the current study and the forthcoming reports by the Commission. Indeed, some accidents have taken place Europe since April 30th 2007. Nevertheless, the available information on the performance of the insurance instruments in place, the losses, the management capacity, etc is very limited. Box 6 presents a recent case of transboundary water pollution between the Flemish and the Walloon regions which occurred in August 2007 (covered by the ELD). Box 7 presents the oil spill of TOTAL at the Donges refinery in France.
Box 6 - Case study in Belgium: Chimac-Agriphar (Le Soir, 2007; la Libre, 2007; Chimac, 2008)

On July 31, 2007 the chemical plant of Chimac-Agriphar released by accident insecticides, 64 kg of Chlorpyrifos and 12 kg of Cypermethrin, in the river Meuse. This accident occurred because the detector of toxic material was out of order. The authorities were alerted only two days later, the time for Chimac-Agriphar to analyse the water in order to know exactly what product have been released.

Fishing was forbidden on Friday (for several weeks), but swimming and other activities were still authorised. On Friday, the Dutch Water Supply Company of Limburg also stopped taking drinking water from the Meuse.

After meeting the Minister of Environment, Chimac-Agriphar had to implement new security measures:

- Re-commission the pool of homogenisation (that was out of order for six months)
- Audit of the security measures
- Buy a second detector of toxic material
- Constant surveillance of the rejected water, with data communication to the Environment Police

The case went to court with the Parquet de Charleroi. The estimation of the environmental damage was difficult. The experts estimated that a quarter of the fish stock were killed i.e. more than 15 tons of fish whereas a study ordered by Chimac-Agriphar to the University of Hasselt estimates only 1,500 kg of killed fishes (none of the species affected were protected).

The way of repopulating the river is also an issue. Most of the killed fishes were brown bullheads illegally imported from the Danube, so it is not clear if reintroducing them would be a solution. On the other hand, introducing new species and new bacteria is likely to unbalance the ecosystem.

The accident was considered to fall under the scope of the ELD and the Wallonia degree transposing the Directive. Hence, the operator Chimac could in principle be held financially responsible for all the costs related to measures that were taken following the accident (monitoring costs, preservation or handhaving, additional compensatory measures, etc.). Further, the Flemish and Dutch competent governments/authorities and the claimant public/concerned stakeholders (=belanghebbende publiek) had thus right to seek compensation from the Wallonian government. Regarding the economic damage, for the moment, the operator had to pay a compensation of approximately €300,000.
Box 7 - Case study in France: The 'TOTAL' oil spill at the Donges refinery (La Baule, 2008; Le Figaro, 2008; Loire, 2008)

On March 16, 2008, a pipe leak caused a spill of an estimated 500 tons of bunker fuel (IFO 380) during the loading of a vessel at the Donges Refinery, in the region of the Loire-Atlantique, in France.

On March 17, the French Minister of Ecology, Energy, Sustainable Development and Planning visited the site to assess the situation and announced that Total would cover all the damages and expenses caused. The same day, a ban was introduced for sea fishing, both for professionals and amateurs, as well as on marine recreational activities and the sale of aquaculture produce. The ban was progressively lifted between the April 4 and the April 18.

On April 10, the case went to court in the Tribunal de Grande Instance de Saint-Nazaire, the complainants were mayors, environmental NGOs and Nantes/ Saint-Nazaire Harbour (l'internaute, 2008). Ninety km of coast and sand banks and 200 hectares of agricultural land were polluted. No dead or wounded birds were found on the Loire but 200 dead birds were found in the île de Ré (lpo, 2008).

The clean-up and recovery at sea and in the estuary, which went on until May 30, were promptly organised:

A recovery vessel with a trawl net at the mouth of the Loire

- Two trawlers collected the tar balls
- Pollution response booms were set
- 750 people cleaned the river banks
- 320,000 cumulated working hours on three months and a half
- 5,226 tons of wastes and polluted materials were recovered, including 444 tons of bunker fuel.

Around 200 businesses related to sea fishing and marine cultures were concerned by these actions. Total was asked to settle a video monitoring system and a gutter under the pipes.

Total met several professionals from the area (shellfish collectors, fishermen, etc.) to define the procedure for defining and listing the damages. It was decided that the damages were to be assessed by a consultancy firm based in Nantes, commissioned by Total. EQUAD, Total’s insurer provided direct compensation (fishermen) or indirect compensation (boat cleaning). Total estimated that the professional compensations and the cleaning costs were up to €50 million, including at least €2 millions only for the fishermen.
### Risk assessment and management

It has been argued by different authors that insured operators could be less active in their risk management. On the contrary, operators covered by ELD seem to be increasingly concerned about risk management. In any case, risk assessment and management are key issues to prevent pollution events. Insurers, and sometimes the operators themselves, impose specific technical safety standards to reduce and control the risks after detailed evaluation and classification of the potential risks. In this way, environmental liability insurance could contribute to the insolvency problem of strict liability and would, moreover, enforce an extensive set of precise technical safety standards. The level of risk management is a significant factor in influencing underwriters on whether or not cover can be offered and if yes, on what conditions. Companies that show a poor commitment to protecting the environment are likely to find it difficult to obtain insurance and even when they can, the terms will probably include high premiums and a substantial element of self insurance. On the other hand, high quality risk management is likely to be rewarded through competitive premiums and coverage. A possible limitation of requiring specific risk management and imposing technical standards is that it can be done only on a case by case basis and, most of the time, not for all the activities of the operator.

In Spain, the Government is preparing a regulatory framework developing the Spanish law transposing the ELD with specific premises on risk assessment, damage evaluation, and the restoration methodology (Orteu, 2008) (see Box 8). This framework, due by December 2008, is supposed to be a key element for assessing the economic losses of the potential damages and should encourage the development of new products.

In Czech Republic as well, methods of risk evaluation for assessment of sufficient financial security and other details would be adopted by means of Government decree under the Act (April 2011).

### Communication on available products to cover environmental liabilities

In order to deal with the problem of lack of awareness about existing products to cover environmental liability, some insurers (e.g. Allianz AGF, AIG, AXA, Victoria, Zurich Insurance and the Pool Español de riesgos medioambientales) carry out active marketing of the new products that have been developed. So far, and according to the information collected from operators, this strategy does not seem to be for the moment very efficient as there some operators complain of not being adequately informed about relevant new existing products to face extended liability under the ELD. On the other hand, most insurers seem to rather react to the customer demand (e.g. the Swiss Reinsurance Company, Generali-Providencia, AEGON, Partner Reinsurance, XL insurance and UNIQA).
Common understanding of the new liabilities introduced by the ELD

Finally, in addition to the possibility of co-operation between insurers to increase the predictability and the possibility of charging an additional risk premium, the predictability of liability (and hence the insurability of that liability) will also be determined by the way in which the conditions for liability have been described. It is obvious that the clearer the conditions for liability are described in the legislation transposing the ELD, and the less uncertain the wording, the higher the predictability of the exposure to liability of the insured will be (i.e. insurers know exactly in what circumstances they are required to pay claims and for what amounts). The more ambiguous the liability laws, the more difficult it may be for an insurance provider to predict the cost of the liability claims, so a clear and unambiguous legal framework is essential.

In the application of the Directive, insurance companies can rely on the Natura 2000 network, which was launched in the European Union in 1992, in order to establish a listing of major conservation sites throughout the EU. The network, which accounts today for more than 25,000 sites, provides a relatively good understanding of the biodiversity within the sites providing some kind of a baseline for damage assessment. The extension of the scope of the Directive to other species and habitats protected under national law may complicate this damage assessment depending on whether baseline conditions have been established.
7. ALTERNATIVE POLICY INSTRUMENTS

7.1. MARKET BASED INSTRUMENTS IN THE CONTEXT OF ELD

Traditionally, MBI are employed for their ability to correct market failures in a cost-effective way, a market failure being defined as a situation where a market is either entirely lacking or where it does not account for the ‘true’ or social cost of an economic activity. MBIs are tools that use market-like approaches to positively influence the behaviour of people. MBIs can be used to alter market prices, set caps on resource use, and improve the way a market works, or create a market where it doesn’t exist. While recognising that market failure is pervasive in the environmental sector and that naturally occurring markets are unlikely to produce socially optimal outcomes, “market like” instruments are expected to play a valuable role. This thesis is in contrast, on the one hand, to centralised regulatory approaches of the “command and control” type, and on the other hand to totally decentralised policies that rely on voluntarism and untargeted subsidies.

The EU increasingly favours MBI because they provide a flexible and cost-effective means for reaching given policy objectives. The more intensive use of MBI has been advocated in the EU’s 6th Environment Action Programme and the renewed EU Sustainable Development Strategy as well as the renewed Lisbon Strategy for Growth and Jobs (EC, 2007a). European Environment agency (EEA) published documents (EEA, 2005; EEA, 2006) to illustrate the use of such instrument in the EU and finally the EU Green paper\(^ {14} \) encourages the use of MBIs for a wide range of policy issues in Europe.

In relation to environmental liability, in the absence of the ELD, the market would not account for the costs of damage to the environment due to the fact that the polluter would not be held responsible for the environmental damage caused. With the introduction of the ELD the ‘polluter-pays principle’ is implemented, which means that the operator now has to take account of the true costs of his actions, including those of environmental damage. However, this principle will only work if funds will be available to remediate the damage that was caused. If the insurance market is not going to develop sufficiently in order to ensure that the new responsibilities of polluters under the ELD are covered, then other instruments might become necessary in order to ensure the effectiveness of the ELD.

\(^{14}\) COM (2007) 140 Green paper on market based instruments for environment and related policy purposes
7.2. MBI RELEVANT TO THE ELD

MBIs have been tested in different countries within and outside the EU (especially USA and Australia) to improve the efficiency and effectiveness of expenditure on prevention and restoration by governments, industries, landholders and the wider community, and to tackle a wide range of complex environmental problems, including declining water quality, salinity, soil erosion, and biodiversity loss.

The European Environment Agency (EEA) classifies MBI into five main groups (EEA, 2006):

1) ** Tradable permits** that aim at reducing emissions or the use of resources in the most effective way by setting market incentives to trade

2) **Environmental taxes** that aim at changing the behaviour of producers and consumers by changing the prices of goods. This type of MBI is designed to raise revenues at the same time.

3) **Environmental charges** aiming to cover the costs of environmental services and abatement measures such as waste disposal

4) **Environmental subsidies and incentives** designed to stimulate the development of new technologies, create new markets, encourage changes in consumer behaviour, and to support achieving higher levels of environmental protection by companies

5) **Liability and compensation schemes** aiming at ensuring adequate compensation for damage resulting from activities dangerous to the environment and provide for means of prevention and reinstatement

According to point 5 above, the ELD is also a MBI in itself. However, the insurance market on which it depends might not respond in a way to make it an efficient MBI if no sufficient cover exists in the market. Other instruments might therefore also be needed to make the Directive efficient in ensuring adequate compensation and to provide for means of prevention and reinstatement. This is not an unusual situation as “experience in recent years shows that the questions of ‘which instrument is best’ has changed to ‘which mix of instruments is best’ (EEA, 2006). In general, threats of liability can encourage the development of markets such as mitigation or biodiversity banking.

Besides the instruments mentioned above, there are other possible instruments that have been applied worldwide that could be useful to constitute a fund that could be used to meet the financial security requirements under the ELD. For example, another example of the use of MBI is habitat banking, as recognised by the Green Paper on market-based instruments for environment and related policy purposes (COM(2007) 140 final), which consist on a trading instrument first developed in the US (in this case, wetland banking) in the context of liability regimes. Such schemes transform environmental liabilities into marketable assets, thus changing incentive structures and behaviour by assigning property rights and creating markets.
The MBIs mentioned above and others found to be relevant to ELD are further discussed below.

### 7.2.1. ENVIRONMENTAL TAXES

Taxes are often used to collect revenue or to correct behaviours when there is a very clear tax base, such as a measurable pollutant. In the case of lost biodiversity as well as damages on soil and water, there are multiple pollutants at play and various other harmful activities to seek to prevent.

Another way in which taxes could be applied in the context of ELD is by promoting and facilitating other financial instruments. For example, in the case of a private reserves or captives by the potentially responsible party for future losses, if these are made without any specific goal, they could be considered as hidden profit by tax authorities and could thus be taxed. If on the other hand, the tax system allows these reserves (and could even encourage them by making them deductible) this self insurance becomes a way in which the potentially responsible parties could make reserves for future losses in a tax friendly way. An example illustrating this last possible application is presented in Box 9.

**Box 9 - The Landfill Tax Credit Scheme (United Kingdom)**

This scheme encourages and enables landfill operators to support a wide range of environmental projects by giving them a 90% tax credit against their donations to environmental bodies, capped at 6.8% of the landfill operator’s tax liability. Credits may be used for a number of objectives, including, as of 2003, the delivery of biodiversity conservation for United Kingdom species and habitats. Biodiversity projects remain a small component of overall landfill tax credit expenditure, however, 159 projects have been programmed since its introduction, including purchasing land as a buffer to a site of special scientific interest (highest provision relating to biodiversity).

### 7.2.2. TRADABLE PERMITS

Through licences or permits, administrative authorities fix an emission standard which must be followed by the potential polluter. These licences play a crucial role in environmental policy in most countries. Although environmental pollution is in the first place controlled through these administrative permits, in individual cases there can still be damage to the environment.

It would be possible in theory that over time a scheme with tradable permits with non-hazardous objects, such as non-endangered species or biotopes, may develop. The REMEDE work may initiate publicly acceptable ways to trade parcels of wetland or forests. This trade may, however, not prevent severe environmental damage.
7.2.3. **ENVIRONMENTAL CHARGES**

Most operators engaged in potentially harmful activities for the environment are subject to a permit for their operations. As a complementary measure to the ELD, environmental supervisory authorities could enforce charges to operators engaging in activities which pose a high risk to violate the ELD (see an example of a permit-related environmental charge in Sweden in Box 10).

Furthermore, it would be possible in theory that over time a scheme with tradable permits with non-hazardous objects, such as non-endangered species or biotopes, may develop.

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**Box 10 - The Swedish Environmental damage and environmental clean-up insurance**

Operators pursuing environmentally hazardous activities that require a permit or notification are to pay contributions to an environmental damage and environmental clean-up insurance fund specified by the Government in an ordinance. Technically, it cannot be seen as a true insurance premium but an environmental charge constituting a fund. If the environment or health is harmed (most cases involve impact on soil or water pollution from historical emissions) the operator found to be guilty is liable to pay compensation. This fund can be used to compensate an injured party for environmental damage (material damage or bodily injury) referred to Chapter 32 of the Swedish Environmental Code if the compensation cannot be obtained from the operator that was liable for the damage. The supervisory authorities are to be able to receive compensation for some clean-up costs through the clean-up insurance when the liable operator cannot pay. The intention of the Environmental Clean-up Insurance/tax is to lower the remediation costs for the Swedish government (SCB, 2005).

After the first ten years (1998 – 2008) the fund consists of around €25 million, with more than 70 claims pending but only one case has so far has received compensation. The fact that compensation has not been paid from the insurance does not seem to be due to any lack of clean-up cases; supervisory authorities have instead said that the narrow framing of some insurance terms and over-strict application of these terms has made it difficult to obtain funds from the insurance, and that this has sometimes led to supervisory authorities thinking that applying for compensation is not even worth the trouble. This criticism seems primarily to have applied to the insurance’s limits on what are compensable clean-up measures. The system is at present under review.

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7.2.4. **RISK SHARING AGREEMENTS**

Faure and Skogh have proposed a risk pooling by operators, a risk sharing agreement as an alternative compensation scheme which could provide higher amounts of coverage to deal with the nuclear risk. Their reasoning, which can also apply to increase capacity for environmental risks, is as follows: “Although large risks may be uninsurable on the traditional insurance market, these large risks might be shared by
ex-ante agreements.” Such ex-ante agreements are often used in cases where the risk is uncertain and possibly difficult to estimate, at least initially before information on probability and possible magnitude of the accident is available. The risk sharing could be realised through an international convention in order to get as many plant owners involved as possible. In the proposed risk sharing agreement, all plants/operators share the costs of accidents where ever they occur in signatory states. In other fields of liability risk sharing agreements are well-known (see Box 11) (Faure and Grineaud, 2000).

**Box 11 - P&I Clubs**

Marine oil pollution is insured by the so-called Protection and Indemnity Clubs (P&I Clubs). The members of these clubs are the tanker owners. They provide insurance on a non-profit basis for the members. At the beginning of each year a "call" is made which should cover the claims and administrative costs. These P&I Clubs function as a mutual insurance company. Profits and losses are shared amongst the members. If the receipts of a year were insufficient to cover the losses an additional call can be asked from the members.

**7.2.5. PAYMENTS FOR ECOSYSTEM SERVICES (PES) SCHEMES**

The UNEP and the IUCN are advocating “Payments for Ecosystem Services (PES) schemes” which reward those whose land provides environmental services with subsidies or market payments from those who benefit from them.

The World Bank is financing PES projects as well in different countries. The Clean Development Mechanism under the Kyoto Protocol is an example of a truly international PES scheme whereby carbon sequestration projects in developing countries are paid for by polluters in developed countries. PES schemes are increasingly used, usually through agricultural ministries, as an alternative to food price supports or input subsidies. Payments can be made for instance to landowners in order to conserve and restore native vegetation or to adopt low external input methods.

In Europe, PES are applied through agri-environmental measures of the Common Agricultural Policy (CAP), to compensate landowners for maintaining forests or wetlands that filter water, act as reservoirs or provide habitats for insects that pollinate neighbouring plantations.

In the context of the ELD, PES could be used in a similar way than the Clean Development Mechanism by allowing polluters to invest in projects that promote biodiversity conservation as an alternative to primary remediation, thus providing financial compensation for any interim loss suffered by the general public.

**7.2.6. HABITAT BANKING**

Since the 1970s, a growing number of regulations have been calling for developers to compensate for the impacts of their activities on the environment and on biodiversity. Developers, especially in the USA with wetlands, started using biodiversity offsets.
Biodiversity offsets, also known as set-asides, compensatory habitat, and mitigation banks (Gibbons, 2007), are conservation actions designed to offset the residual, unavoidable damage to biodiversity caused by development activities, so as to ensure “not net loss” of biodiversity (ten Kate et al., 2004). The “no net loss” principle can imply that compensatory activities should aim to maintain the same optimal level of biodiversity, but they can also mean a “net gain”, where the aim is to improve biodiversity quality. Biodiversity offsets are not meant to compensate for poor environmental management: they are additional to other measures that are in place to avoid, or minimise, environmental damage (ten Kate et al., 2004).

In the beginning, biodiversity offsets were organised on a case-by-case basis, with permit seekers compensating for their impacts by permanently protecting and restoring environmental features similar to the ones impacted on-site. While this flexibility has resulted in some good biodiversity outcomes, there is generally no guarantee that the offsets will be managed for conservation or that they will not be pressure to develop land in the future. In addition, these independent projects tend to have a small biodiversity impact since they result in several, small, fragmented areas which often cannot sustain viable populations. Despite various issues, biodiversity offsets are gaining in popularity, and are now a part of the legal framework of countries including the USA, Australia, Brazil, Europe and Canada (ten Kate et al., 2004). Demonstration projects are also widely implemented (e.g., Business and Biodiversity Offset Program pilots/case studies in Washington (Washington Biodiversity Project, 2006), Australia (DEC, 2006), but also Ghana, Mexico, Qatar, South Africa and Uganda (Burgin, 2008).

In response to the inadequacy of site-by-site compensation and to exploit this market for biodiversity offsets, habitat banking emerged. Habitat banks are sites chosen for their ability to protect and restore environmental features, such as wetlands.

In the context of the ELD, habitat banking introduces a system for complementary remediation by allowing operators that participate to offset the damage they have caused, mainly to biodiversity and habitats, with the creation of an alternative site.

In the USA, the process of habitat banking commenced with the imperative for the protection of wetland ecosystems (Clean Water Act). Since that time, the concept has received increased attention, and the scheme now encompasses broader habitat and species banks (Bean, 2000), and is becoming a global phenomenon. In particular, species bank, also known as conservation banks, generally protects specific threatened and endangered species habitat (see Box 12 for an example). Therefore, species banks are a type of habitat banks which are protected/managed specifically to enhance the presence of rare species and which are usually approved by the wildlife or environmental agencies. Nowadays, over 40,000 acres are held in habitat banks in the state of California, with wetland banks representing only 10% of these approximately (see Box 13).
Box 12 - Biodiversity offset on-site: the red cockaded woodpecker (ten Kate et al., 2004)

- Biodiversity context: the habitat of the red-cockaded woodpecker is old pine forest with senescent trees, maintained by periodic fires. The species is vulnerable in view of its small, fragmented populations.
- Developer: International Paper, owner of many woodlands
- Development: logging for paper production (wood pulp)
- Habitat banking:
  - State of woodpecker population on-site: 18 family groups in 1998
  - Action: set-up a “conservation bank” in one of the larger woodlands, so that it can sustain a large, viable population of woodpeckers. Translocation of birds to the larger woodland.
  - Result: extra 11 family groups in 2003, allowing logging in some of the smaller woodland holdings.
  - Economical benefit: 1 “woodpecker credit” valued in excess of $150,000

In general, offsetting can occur through a quota system which is currently evolving either into formal banking arrangements with government oversight, or through condominium arrangements where groups of landowners establish private conservation banks to offset their collective liabilities (Bezerra, 2007). In the case of species banking, credits are established for the specific sensitive species that occur on the site.

Many habitat banking schemes also enjoy financial success. There are now thought to be over 150 institutions in the US dealing with habitat banking, and most have seen considerable increase in activity, financial value and investment return (Latimer, 2007). This has transformed endangered species and habitats into assets with direct monetary as well as aesthetic value (Fox, 2005).

7.2.7. COMPENSATORY FUNDS

The money that is collected by means of different MBIs, such charges or taxes, can constitute a fund that can be used to face remediation costs. Alternatively, funds can also be created by operators in order to face potential environmental liabilities. There are different types of funds that can be identified. In the context of ELD, the most relevant are as follows:
Box 13 - Habitat banking in California (USA) – wetland banking

**History:** since the mid-1980s, the State of California has actively sought to promote the development of wetland mitigation banks, or large areas of created, restored, enhanced or preserved wetlands set aside for the purpose of providing offsets for developments impacting wetlands. In recent years the State of California has sought to consolidate mitigation requirements for wetlands. In 1995, the California EPA and the California Resources Agency issued a joint statement on habitat banks, setting the rationale for establishing and managing banks. This was followed up by a formal policy guidance established by 5 federal agencies (US Army Corps of Engineers, US EPA, USDE Natural Resources Conservation Service, US Fish and Wildlife Service, NOAA). This guidance also requires that a Mitigation Bank Review Team (MBRT) is formed with all stakeholders which have jurisdiction over the wetlands in order to obtain consensus on any action taken by the bank.

**Wetland habitat banks in California:**

<table>
<thead>
<tr>
<th>Wetland Bank</th>
<th>Year of creation</th>
<th>Acres</th>
<th>Credits total/sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barry Jones Wetland Mitigation Bank</td>
<td>1998</td>
<td>140</td>
<td>136/29.5</td>
</tr>
<tr>
<td>Bryte Ranch Conservation Bank</td>
<td>2001</td>
<td>573</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>158/67</td>
<td></td>
</tr>
<tr>
<td>Burdell Ranch Wetland Mitigation Bank</td>
<td>2001</td>
<td>83</td>
<td>241/76</td>
</tr>
<tr>
<td>Clay station Mitigation Bank</td>
<td>1999</td>
<td>405</td>
<td>87/54</td>
</tr>
<tr>
<td>Cottonwood Creek Wetland Mitigation Bank</td>
<td>1994</td>
<td>90</td>
<td>24/24</td>
</tr>
<tr>
<td>Desmond Mitigation Bank</td>
<td>2005</td>
<td>49</td>
<td>25/3.5</td>
</tr>
<tr>
<td>Dolan Ranch Conservation Bank</td>
<td>1999</td>
<td>252</td>
<td>33/22</td>
</tr>
<tr>
<td>Hazel Mitigation Bank</td>
<td>2006</td>
<td>101</td>
<td>30/13</td>
</tr>
<tr>
<td>Honey Lake Wetland Mitigation Bank</td>
<td>2001</td>
<td>300</td>
<td>17/0</td>
</tr>
<tr>
<td>Horn Mitigation Bank</td>
<td>2006</td>
<td>32.5</td>
<td>16/1</td>
</tr>
<tr>
<td>Kimball Island Mitigation Bank</td>
<td>1998</td>
<td>109</td>
<td>132/132</td>
</tr>
<tr>
<td>Laguna (Carinalli) Mitigation Bank</td>
<td>2001</td>
<td>28</td>
<td>55/55</td>
</tr>
<tr>
<td>Orchard Creek Conservation Bank</td>
<td>1997</td>
<td>632</td>
<td>75/75</td>
</tr>
<tr>
<td>Pilgrim Creek Mitigation Bank</td>
<td>2000</td>
<td>121</td>
<td>50/43</td>
</tr>
<tr>
<td>Rancho Jamul Mitigation Bank</td>
<td>2000</td>
<td>109</td>
<td>56/33</td>
</tr>
<tr>
<td>Southwest StaRosa Vernal Pool Preservation Bank</td>
<td>1997</td>
<td>39.4</td>
<td>251/251</td>
</tr>
<tr>
<td>Springfield Natural Communities Reserve</td>
<td>1997</td>
<td>51.7</td>
<td>517/246</td>
</tr>
<tr>
<td>Stillwater Plains Mitigation Bank</td>
<td>2000</td>
<td>260</td>
<td>65/18</td>
</tr>
<tr>
<td>Swift-Turner Mitigation Bank</td>
<td>2006</td>
<td>34</td>
<td>7.5/0</td>
</tr>
<tr>
<td>Wikiup Mitigation Bank</td>
<td>1995</td>
<td>12</td>
<td>60/60</td>
</tr>
<tr>
<td>Willards Mitigation Bank</td>
<td>1994</td>
<td>615</td>
<td>334/285</td>
</tr>
<tr>
<td>Wright Mitigation Bank</td>
<td>1997</td>
<td>174</td>
<td>600/125</td>
</tr>
</tbody>
</table>

**Limitation Fund**

In the case of serial damage to the environment, the liable enterprise may be willing to agree to a settlement with the victims on the condition that he can offer a certain sum to all the victims whereby he can reach a final settlement for the damage caused by a specific polluting event. To this end, the operator raises a fund that will have to be used to compensate all victims. It is called a limitation fund since the operator agreeing to such a settlement usually wishes to limit its liability to the amount brought into the fund. In this case, no risk spreading with other
(potential) manufacturers takes place, since only the liable manufacturer finances the fund. Examples of such a limitation fund can be found in the area of civil liability for oil pollution damage. Article V of the Convention of Brussels on Civil Liability for Oil Pollution Damage provides for the possibility for the liable tanker owner to provide for a limitation fund that should compensate victims.

- **Advancement Fund**

A second arrangement referred to as fund is the advancement fund, which consist on a remedy for long-lasting civil procedures concerning liability that can last much longer than the life of the victim, such as in the case of asbestos victims. Examples of these advancement funds can also be found in environmental legislation. In Belgium, the Act of 10 January 1977 installed an advancement fund for damage caused by groundwater extraction. It is uncertain whether this advancement fund can play a large role in case of environmental damage.

- **Guarantee funds**

Guarantee funds are well-known as instruments to protect victims against the possible insolvency of a liable injurer or his insurer. The advantage of a guarantee fund is that it only intervenes for the so-called excess risk, being the risk for which in the specific case for various reasons no insurance coverage is available. However, it is essential that a guarantee fund only intervenes if other compensation mechanisms, such as insurance, have failed.

- **Environmental Fund**

A fourth alternative could be the environmental fund that would generally operate as a substitute for insurance. Although it is often not very specific, it is usually in a manner similar to the compensation fund. However, if these compensation funds were to be used as alternative for the liability system, inevitably the question will arise how they can be financed in an adequate way. Therefore, it is important to distinguish between compensation funds on the one hand and liability combined with insurance on the other hand as instruments to provide compensation for damage.

An example of this type of fund would be the US Superfund introduced through CERCLA, which allowed the EPA to address abandoned hazardous waste sites by realising cleanups and compelling responsible parties to perform cleanups or reimburse the government for EPA-lead cleanups. One major issue of this fund was its financing. Between 1980 and 1994, the program was financed by public funds through a tax on polluting activities. Nevertheless, when the tax was abolished, the program started suffering a financial crisis. It is now mainly financed by a federal grant.
7.3. WHY USE MBIS?

Liability regimes open up the possibility for a number of markets including trading in “biodiversity offsets”. Recent experience in the use of MBI in the context of different regulatory regimes include wetland and conservation banking in the USA, tradable forest conservation obligations in Brazil and habitat compensation requirements in Australia, Canada and the EU. The main interest in MBIs stems from a concern that, in the future, sole reliance on traditional policy approaches, such as direct ‘command and control’ regulation, education and suasion may be insufficient to achieve desired natural resource outcomes. Governments are also interested in MBIs because of their potential to achieve environmental goals at a more affordable cost to the community. There has also been a shift in attitude among some stakeholders who previously viewed the market as a powerful adversary, but now consider it to be a useful ally.

In addition, the viability of applying MBIs has increased. Economists now understand much more about how to design markets and information systems needed for complex natural resource problems. There is also a higher probability that environmental scientists and engineers can provide the information needed to make markets viable. However, there remain many, as yet unresolved, impediments to the effective and efficient use of MBI schemes or to the establishment of viable markets.

However, MBI should not be perceived as a quick fix, and there is still a lot to be learnt about them. Importantly, MBIs are generally being viewed as one aspect of the policy armoury worthy of further investigation and refinement, rather than a complete substitute for existing approaches. Indeed, in most cases MBIs require a regulatory framework to operate. A key challenge is to discover more about the range of circumstances under which MBIs can successfully be applied.

MBIs can be more cost-effective for delivering environmental outcomes than many traditional methods. They are a positive element to influence, encouraging people to address environmental issues, rather than wielding a disincentive approach through regulations and penalties. In contrast to ‘command and control’ approaches that prescribe a particular behaviour or use of technology/product, MBIs are valuable tools to:

- provide flexibility for prevention of pollution and reinstatement. This is because MBIs work by changing the incentives faced by market participants so that the best private choice is also the best public choice. Provided transaction costs are not too high, MBIs utilise information more effectively than centralised approaches because they employ the information and knowledge that resides with individuals who know different aspects of environmental management
- encourage innovation to address environmental issues. MBIs provide incentives to develop or use new technologies and solutions and lead to more cost-effective environmental outcomes. Indeed, they promote efficiency gains
through reallocation of pollution abatement costs. The costs of pollution reduction typically vary among firms, and efficient firms should seek to lower their pollution tax burden by investing in cleaner production technologies where this is cost effective

- contribute to long-term and self-sustaining solutions
- promote private investment in for remediation of damage to water or protected species or natural habitats and compensation
- address market failures (where markets do not ensure the sustainable management of natural resources, e.g. landholders may have little incentive to conserve a wetland of significant biodiversity value)
- allow measurement of progress against regional goals and targets

7.4. MBI AND THE PRIVATE SECTOR

When taking care of a public good – such as valuable flora and fauna - it is important to form public-private partnerships where all actors benefit to ensure that development is heading in the right direction. For the polluter-pays principle to work, it is important to ensure solvency for the polluters and insurers and also to have common understanding of the value of the public good. Solvency can be ensured through the use of a system of financial security instruments, to assign proxy market values for unpriced goods is still controversial. Many object to the limitations of the valuation techniques available today. What is the true economic value of a wetland or biological diversity? One can argue that in search of the perfect estimation, the world economy tends to not value these precious public goods at all, and in that perspective the world may end up inadvertently over-consuming these goods.

Another important guiding principle for the ELD, the precautionary principle, highlights the importance to in a great extent prevent environmental damage. It is therefore crucial to have efficient enforcement strategies and auditing of the financial security solutions in place, as well as other motivating incentives, so that operators clearly see the benefits of working with mitigation measures. Financial security instruments are by no means to be seen as a substitute for mitigating measures, rather as a motivating instrument. If the operator reduces its environmental risks the costs for premiums and other costs for financial security measures will be reduced as well. If motivating instruments (carrots) are not enough for operators to follow the ELD, then it could be up to national authorities to enforce environmental charges – perhaps coupled with the permit for high-risk operators - that are large enough to give incentives to prevent future environmental damage.

From the operators perspective it will always be of interest to be able to choose from different instruments depending on the company’s risk appetite and their decision to have in-house risk management expertise or not. However, it is crucial for a competitive market to function that there is plenty of risk-related information available
to all actors. There will probably be some years of market consolidation (a so-called learning curve process) when new products are developed. Risk information coupled with the costs of the risk (in forms of e.g. insurance premiums and claims) is also an important step in achieving the goal of setting up incentives of mitigation measures.

The conditions for markets that are readily found with many pollutants – both for permits and offsets – are less readily available for biodiversity and habitats. Indeed, biodiversity offsets are likely to be a private liability to the holder, which means that a secondary market in offsets is unlikely to emerge. However, personal markets for offsetting arrangements for biodiversity may emerge as contractual relations between parties who seek or require offsetting activities, and parties who may hold environmental assets which are suitable for offsetting.

Regarding risk sharing agreements by operators, they may provide better results if either capacity on insurance markets is limited or if it can be assumed that information necessary to optimally control risk (and moral hazard) is better available with operators than with insurers. Some experiences with larger risks (oil pollution and nuclear liability) have shown that these risk sharing agreements may in some cases provide better results than traditional liability insurance. An advantage of these alternative arrangements is, moreover, that one does not necessarily need adequate information on the predictability of the risk, provided that an adequate monitoring is possible (Faure and Grineaud, 2000).

For an operator, the distortions made by subsidies and incentives are comparable to the effects of a national tax.

7.5. **MBI AND MS AUTHORITIES**

The use of MBI by competent authorities to protect biodiversity is not a new one. All standard types of MBI, taxes/charges/fees, subsidies, and tradable permits are in use, mainly for habitat and ecosystem conservation, but also for the protection of specific species. Examples include the use of charges and fees for hunting and fishing permits, PES in the framework of the Common Agricultural Policy, and the US trading instrument ‘habitat banking’. The latter was set up in the context of liability regimes for the damage to habitats resulting from planned projects. Remediation is therefore sold as any other service. The ELD explicitly allows for this kind of complementary remediation for damage to water or protected species or natural habitats (remediation at a different location when the primary remediation does not result in fully restoring the damages natural resource and/or services). However, within the ELD this type of remediation is only second choice to primary remediation on the damaged site itself and a habitat baking system for which it is of no (or little) importance where the site is located does not respond to the needs according to the ELD.

It is best to use MBIs when there are many ways of solving a problem but each solution has a significant difference in costs to individuals and the community. MBIs can reduce compliance costs by encouraging greater change where change is relatively cheap or
easy, rather than asking all operators to make the same level of change. It is important to note that MBIs often rely on a regulatory framework to operate effectively. MBIs are likely to out-perform other instruments when:

- large variations exist in the ability of potential operators to provide the desired outcomes
- there is flexibility in the range of responses that will deliver the desired outcome
- regulatory approaches are difficult to design, implement and administer
- there is scope for innovation in improving natural resource management.

MBIs alone cannot achieve improved environmental outcomes, but they can serve as an additional tool, which can be used in combination with other policy and economic instruments.

The most basic pre-condition for an effective MBI in relation to the ELD is that it is to be revenue generating in order to build up a fund out of which remediation measures can be paid. Permits, charges, and taxes can generate revenues whereas this is not the case with subsidies and incentives. Furthermore, it should not be an instrument that aims at achieving results at least costs but leaves the ultimate choice to the operators: tradable permits, for example, are designed in a way that they change the behaviour of those for whom it is not too expensive (i.e. low pollution abatement costs) but allow for no behaviour change for those for whom it would be very expensive (i.e. high pollution abatement costs). In case of the ELD, however, the idea behind a MBI in addition to the ELD is that all companies have sufficient cover for their environmental liabilities and not only those for whom this would be least expensive.

Charges as well as taxes could generate the revenues for an environmental liability fund. These fund-raising systems would therefore provide for large certainty in regards of the objective of the ELD, compared to a system that purely relies on the insurance market to be developed and be attractive enough for operators to cover their risks. At the same time they would bring about behaviour change and foster innovation by charging lower amounts to companies with safer technologies and better EMS in place.

Even though compensatory funds might encourage free riding in the normal case by some operators as they see no incentive to invest in cleaner production methods, this could be avoided by determining the amount to be paid according to e.g. the cleanliness of the production methods or the comprehensiveness of the EMS in place. Also, the question is whether compensation for environmental damage should be provided through compensation funds. Well-known in this respect is the United States Superfund, introduced through CERCLA, which has led to a lot of criticism (see section 4.6).

Regarding taxes, however, it may be a challenging task to find a suitable tax base. Taxes are set by national authorities. For operators operating on an international market it can pose a problem with competition if taxes are set very different levels
Whereas taxes are likely to be difficult to implement due to the unanimity requirement in the tax area, permits should be easier to implement. A large part of operators that fall under the Annex III already need an IPPC permit so that interlinking these two measures could be a cost-effective way of introducing charges.

In relation to charges, in practice, the administrative costs associated with tailor-made charges are usually very high and seldom considered cost-effective. However, if the charges will prevent environmental damage, the socio-economic benefits could be greater than the costs and may after all be the best overall solution. To implement a charges linked to an operating permit to cover environmental liabilities under the ELD would clearly be most relevant in those cases where the private insurance market is not sufficiently developed or where demand is too low to offer these products, e.g. in the case of compensatory remediation.

The fact that this type of charge is enforceable is proven by different MS examples, such as the compulsory payment for operator licensing in Ireland, or the levy on oil important or transported through Finland to finance a fund for financing oil combating costs.

However, it should be noted that there are various reasons why insurers do not respond to the new market opportunities and that the administrators of a remediation fund would encounter similar problems as the private insurance market, i.e. lack of experience and data in the field, unclear issues in case of transboundary damage, undefined baseline conditions to estimate the damage, etc. This means that the actual implementation and running costs can be very high for governmental administration of a fund for remediation and compensatory measures.
8. CONCLUSIONS

Based on the analysis of the outcomes of the stakeholder consultation (MS questionnaire, industry questionnaire, and interviews with operators) and the literature review, following conclusions can be made.

8.1. TRANSPOSITION OF THE ELD AND FINANCIAL SECURITY

The transposition of the ELD is still ongoing in some MS throughout the EU after the deadline of 30 April 2007. The Directive leaves a large degree of flexibility to the MS in the transposition, which has generated a large degree of variability in the approaches regarding possible exemptions, financial security, liability concepts, etc.

A compulsory financial security system has been chosen by six MS (Bulgaria, Hungary, Czech Republic, Slovakia, Romania, and Spain) in the transposition process of the ELD. Nevertheless, it is important to highlight that a compulsory financial security requirement is not necessary restricted to insurance products. Indeed, in Slovakia, Czech Republic, and Spain, for example, operators will have the possibility to choose among different mechanisms to cover their risks. Consequently, the introduction of such mandatory scheme would not only rely on insurance products but also on the availability of other forms of financial security such as bank bonds and assets deposit. In such case, insurers may decide not to provide coverage for environmental liability introduced by ELD as they are not obliged to insure.

The main advantages of this compulsory financial security lie in the fact that it would promote a faster development and penetration of insurance products and other forms of financial security instruments and a good cross-redistribution of risks as all operators would be obliged to participate. Indeed, in the past, the cost of remediation in the case of pollution events was mainly covered with public budget. Nevertheless, this system could also have major drawbacks. For example, regarding insurance, the introduction of such mandatory scheme could favour, in a not mature market, and with a limited number of insurers and brokers, the increase of the premiums. Moreover, it could have a negative influence on the motivation of certain operators to manage their risks. Some insurer companies and operators are still against the introduction of this type of schemes.

8.2. THE INSURANCE MARKET

Insurance is the most popular instrument to cover environmental liability. A question that inevitably arises when issues of environmental damage are discussed is whether traditional liability law, combined with insurance is at all able to provide for compensation of the type environmental damage, covered in the ELD.
Given that the ELD is still in the process of being transposed, the market development is currently hindered by uncertainties as to how different MS will transpose the Directive. Indeed, nowadays, the insurance market covering environmental liability is still perceived to be basic as regards the number of products that are provided, their uptake and the many liabilities under the ELD that still remain insurable.

The drivers for the growth of the environmental insurance market are: increase in legislation, public awareness, corporate policy, and professional understanding of its availability amongst lawyers and consultants.

A large part of the environmental liabilities under the ELD can be covered under EIL policies (offered on a stand-alone basis or combined with other products), or new, specialised stand-alone products developed by insurers and re-insurers. Extensions to GTPL policies can also cover environmental liabilities under the ELD, the extent of application being subject to underwriting and additional premiums. So far, the preferred option to deal with environmental liability under the ELD is EIL and stand-alone insurance products, rather than GTPL/integrated products. Nevertheless, and contrary to GTPL insurance (i.e. insurance cover provided for traditional damage as a consequence of a sudden & accidental pollution incident), stand-alone environmental liability insurance schemes are still in their infancy in Europe, and it can be considered still as a niche market with specialist underwriters offering products selectively with highly detailed risk assessment criteria. Furthermore, this type of products still has in general large premiums, which limits their uptake by operating SMEs.

At the present time, it is difficult to evaluate the efficiency of insurance products covering ELD, mainly due to their recent introduction in the market and novelty.

Many insurers cover sudden and accidental event, yet damages such as the ones linked to intentional or permitted acts, asbestos, or GMO are often excluded. Also, there is limited coverage for gradual compensation and for compensatory remediation. Whereas for primary and complementary compensation the insurance industry has some, albeit limited, experience, for compensatory remediation this experience does not really exist.

Regarding the capacity of insurers, in spite the fact that the market is developing and the capacities are growing, these might still be insufficient to face potential losses related to environmental damage.

ART and self-insurance can be a good means of covering risk that is not (yet) insurable or too costly to insure. These forms are especially interesting in the sense that they can provide insurers with the background knowledge on risk and cost assessment needed to develop adequate products.

8.3. OPERATORS’ PERSPECTIVE

Little experience of operators in the field of environmental liability and the lack of awareness about their new responsibilities and risks represents can also be considered
as one of the main aspects hindering the further development of the environmental insurance market, as they do not demand products to cover their environmental risks. The results from the operators’ interviews show that none of the interviewed operators had actually adapted their insurance policies to the extended liability induced by ELD. Some of them were even not aware of the ELD.

Operators are waiting for preceding ELD cases, until then they do not foresee a demand for financial security products. An exception is in mergers & acquisitions or for tax reasons, where the demand for alternative environmental risk transfer instruments already is high.

Another element to take into account is the proper adaptation of the installation to the current legal requirements. Certain operators are currently carrying out their economic activities without fully complying with environmental legislation. This circumstance also affects the premium to be paid by the operator because the environmental risk is higher.

8.4. GAPS, LIMITATIONS, AND POSSIBLE SOLUTIONS

The delays in the transposition of the Directive and the different specific legal frameworks across Europe prevent the insurance industry from having a precise overview of future needs in some MS, particularly for those operators with cross-European activities, which in turn hinders the development of more far-reaching products. This could results in problems in the case of transboundary pollution, for example, when defining which regime will be applied or which authorities will have the final say about remediation measures. Some insurers, for example, introduce exceptions related to potential transboundary issues. On the other hand, most insurers offer products open to operators active in other EU countries and to cover cross-border cases of pollution.

European insurance companies have little previous experience in the field of environmental liability and the high degree of uncertainty regarding the impact of the Directive on loss frequency and loss severity makes it also difficult for insurers to quantify the expected losses to be considered when setting the financial limits of the coverage provided. Indeed, the unavailability of data necessary for risk evaluation, the lack of experience how to handle the claims and the evaluation of the claim have identified as the most pressing limitations. The limited experience in cost damage assessment poses problems especially for the development of products covering compensatory remediation and gradual pollution. While GTPL underwriting is based on past losses/claims and hazard assessment, EIL underwriting is based on environmental risk assessment due to absence of data. Therefore, the uncertainties in respect to certain points in the ELD are expected to affect more to the GTPL market as past data is not available.

Another important aspect that could limit the current development of the market is the existing costs of the insurance policies. The ELD contains unfamiliar concepts like
complementary and compensatory remediation so that products are likely to be expensive in the beginning and that coverage is unlikely to be attractive to smaller companies. Furthermore, to calculate the coverage, a previous risk assessment of the installation is needed. If the installation has not assessed those risks, the insurance company will have to do it and, of course, it will charge operator with the cost. That implies a more expensive premium for the operator.

Insurers and policyholders need to ensure that they are well aware of the new risks that might be encountered also under these policies due to the ELD and of the potential overlap with the newly developed policies.

Essentially, for there to be a true market, there needs to be sufficient number of insurers offering a range of products and in sufficient financial amounts for there to be competition and choice for the customer. It is most likely to develop against the backdrop of a clear and predictable national framework for environmental liability that closely matches the ELD.

To deal with the problem of data availability for risk and data estimations, it would be advisable to create a database of anonymous ELD based losses given by NAs and competent authorities or run studies on past cases of environmental damages to evaluate the cost for a hypothetic insurer.

8.5. APPLICATION OF MBI IN THE CONTEXT OF THE ELD

All standard types of MBI, taxes/charges/fees, subsidies, and tradable permits are in use, mainly for habitat and ecosystem conservation, but also for the protection of specific species. The applicability of MBIs in the context of the ELD has not been really considered to date, and the cases of operators applying this type of instruments are still rare. Further research on the potential application of different MBIs should be carried out once the market is more consolidated.

To implement charges linked to an operating permit to cover environmental liabilities under the ELD seems to be one of the most promising and feasible instrument. It would clearly be most relevant in those cases where the private insurance market is not sufficiently developed or where demand is too low to offer these products, e.g. in the case of compensatory remediation.

From the operators’ perspective, it will always be of interest to be able to choose from different instruments depending on the company’s risk appetite and their decision to have in-house risk management expertise. However, it is crucial for a competitive market to function that there is plenty of risk-related information available to all actors. MBIs alone cannot achieve improved environmental outcomes, but they can serve as an additional tool, which can be used in combination with other policy and economic instruments.
8.6. FUTURE WORK

Different gaps and limitation of the current financial security market to cover all the liabilities introduced by the ELD have been presented and discussed in this report.

As commented before, although some policies and products relevant for the matter already exist or are being developed, in general it is observed that the offer of specific environmental insurances and their coverage offered is still limited. In order to transform the environmental liability market from being niche to mainstream though the increase of the offer and the demand and the development of far-more reaching products, the market needs further experience and knowledge development, increased market capacity, broader scope of covers and further innovation in claims management.

In this regard, and based on the analysis carried out in this study and the information currently available, we identified different aspects that still need further work and analysis. These are further described below:

8.6.1. A CLEAR LEGAL FRAMEWORK

A clear and unambiguous legal framework is crucial for enhancing insurability. For example, in most MS that have transposed the Directive, a clear guidance about the priorities and weight given by the authorities to the criteria listed in Annex II to choose the most appropriate measures to ensure the remedying of environmental damage is not available. A lack of prioritisation leads to legal uncertainty and most likely different approaches among the MS.

Furthermore, guidance about the priorities and interpretation on the different definitions and interpretations of the respective national transpositions and the ELD would be useful in order to promote a common understanding of the Directive and the identification of different approaches.

It is still not clear what will be the approach in the nine MS that have not yet finalised the transposition of the ELD and how the implementation will work in practice in those that have already transposed the Directive. Future work will need to further update and analyse the progress in the transposition of ELD in the MS, with emphasis on those MS that have not yet transposed the Directive by September 2008 and thus information is not available. In particular, in those MS which have transposed the ELD, it would be necessary to follow up the measures that have been implemented for the financial security issues (e.g. mandatory financial security) and evaluate their performance and possible weak points and gaps.

8.6.2. BETTER COMMUNICATION AMONG STAKEHOLDERS

As it was discussed during the workshop organised in the framework of the current study, information on specific insurance products should be disseminated and an effort should be made to further share the information among different stakeholders (e.g. operators, brokers, insurers, etc.). As commented in this report, the information about
new available products, as well as the new liabilities introduced by the ELD operators is perceived as a pressing problem for operators, particularly in the case of SMEs, which also limit the further development of the market. Insurers depend greatly on brokers for the distribution of new products and in some cases there is a lack of awareness on the availability of solutions available in the market.

The question of how to inform and educate operators about their new responsibilities, brokers about new products, and insurers about how to develop new products that better cover the liabilities introduced by the ELD might be essential.

In this regard, it will be necessary to promote the dialogue between MS, insurers and operators. For example, the creation of a permanent information exchange platform with MS, operators, insurers, and other relevant stakeholders could be very useful to promote information exchange.

Discussion with the national transposition authorities, through the national insurance associations could contribute to sharing updates on legal and insurance related developments within the MS and to initiate discussions with competent authorities to develop plans for cooperation that will assist with the development of insurance products (e.g. to develop methods to evaluate and restore environmental damage in the most effective and cost efficient manner).

8.6.3. SHARING COMMON INFORMATION AND EXPERIENCE

As highlighted by most stakeholders, unavailability of data necessary for risk evaluation, lack of experience how to handle the claims, and evaluation of claims are some of the most pressing problems for the further development of the insurance market.

A compilation of recent events under ELD (case studies database) to illustrate how implementation works in practice and the performance of the available financial security products would be necessary. Also such database could be useful to establish best practices for the handling of claims.

At this point, the available information of relevant and illustrative information on the performance of the insurance instruments in place, the losses, the management capacity, etc. is still very limited. Future work could focus on the information of the following information:

- type of incident and description of the environmental damages
- type of operator and activity sector
- description of the financial security instrument covering the environmental liability of the operator
- implication of the competent authorities
- methods and approaches used for valuing the appropriate remediation
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- description of the remediation process (including the techniques used and the costs)

MS governments could play an important role when it came to gathering and distributing information in this context.

8.6.4. Developing and sharing risk and damage evaluation techniques

There is currently a lack of statistical information regarding cases of environmental damage. In particular the following aspects will need further research:

- Calculation of the amounts likely to be paid out in claims
- Economic evaluation of environmental damages as any loss to be compensated must be quantifiable in monetary terms
- Estimation of the probability of any loss and prediction of the severity of losses

Information on claims and losses could be gathered from recent pollution events under the ELD. In this regards, CEA has started collecting cases which have occurred since April 30th in other MS and that are publicly available.

Some insurers, insurance associations, and MS (e.g. Spain and France) have already started to develop guidance on how to assess risks and estimate environmental damages and some information regarding remediation of environmental damage is available at the European level especially in the context of the REMEDE project.

8.6.5. Operator’s issues

Very limited information is available about current operator’s needs and attitudes towards the transposing and implementing provisions of the ELD as well as the expectations of operators from financial security providers. Further work shall better identify and analyse such aspects and promote their participation in the information exchange and discussion process.
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10. CONTACTS / ACKNOWLEDGEMENTS

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- Otonicar, Anita Maria (Federal Ministry of Agriculture, Forestry, Environment and Water Management Austria)
- Tettamanti, Bernard (Casualty Swiss Reinsurance Company, Switzerland)
- Burrell, Ian (Arthur J. Gallagher (UK) Limited)
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11. APPENDICES

11.1. APPENDIX I – RELEVANT DEFINITIONS

Environmental Damage

Environmental damage is defined as damage to EC-protected species\textsuperscript{15} and natural habitats\textsuperscript{16}, water falling within the scope of the Water Framework Directive\textsuperscript{17}, and land contamination which threatens human health.

- Damage to protected species and natural habitats is defined as

  \textit{any damage that has significant adverse effects on reaching or maintaining the favourable conservation status of such habitats or species}

Article 2(1) - including any significant adverse effects on reaching or maintaining the favourable conservation status of protected habitats or species

The significance of the effect is determined by reference to:

- conservation status at the time of the damage
- services provided by the amenities these habitats or species produce
- their capacity for natural regeneration

Annex I provides guidance in relation to how significant adverse changes to baseline conditions should be determined

- Water damage is defined as:

  \textit{any damage that significantly adversely affects the ecological, chemical and/or quantitative status and/or ecological potential, as defined in Directive 2000/60/EEC, of the waters concerned.}

- Land damage is defined as:

  \textit{any land contamination that creates a significant risk of human health being adversely affected as a result of the direct or indirect introduction, in, on or under land, of substances, preparations, organisms or micro-organisms.}

\textsuperscript{15} Species mentioned in Article 4(2) of Directive 79/409/EEC (on the conservation of wild birds) or listed in Annex I or listed in Annexes II and IV to Directive 92/43/EEC (on the conservation of natural habitats and of wild fauna and flora).

\textsuperscript{16} the habitats of species under Directive 79/409/EEC (FN5 above) or the natural habitats listed in Annex I to Directive 92/43/EEC and the breeding sites or resting places of the species listed in Annex IV to that Directive.

Damage is defined as:

- **a measurable adverse change in a natural resource or measurable impairment of a natural resource service which may occur directly or indirectly.**

Under the ELD operators of certain “occupational activities” will be held strictly liable for any environmental damage caused by such occupational activities or any imminent threat of such damage. “Occupational Activities” has a wide definition which includes public and private activities, business and undertakings, regardless of whether these undertakings are for profit listed at Annex III. Under the ELD the Operator who carries out an activity that has caused environmental damage or an imminent threat of such damage is to be held financially liable

“Operator” - “any natural or legal private or public person who operates or controls the occupational activity or, where this is provided for in national legislation, to whom decisive economic power over the technical functioning of such an activity has been delegated, including the holder of a permit or authorisation for such an activity or the person registering or notifying such an activity”

### Competent Authority

A Competent Authority is to be designated by a MS and such authority is

- responsible for establishing which operator caused the damage or the imminent threat of the damage
- responsible for assessing the significance of the damage
- responsible for determining which remedial measure should be taken (with reference to Annex II)

Hence, the Competent Authority is entitled to require the relevant operator to carry out his own assessment and to supply and information and data necessary and it must have the power to empower or require third parties to carry out the necessary preventative or remedial measures.

ELD is aimed at remedying damage to the environment. Therefore it does not deal with traditional civil damages such as payment for personal injury, property damage or economic loss.

### Exceptions

ELD does not apply to an imminent threat of environmental damage arising from an incident in respect of which compensation falls within the scope of the international conventions listed at Annex IV.

An operator can continue to limit his liability in accordance with national legislation implementing conventions concerning maritime and inland navigation claims.

The ELD does not apply to damage in respect of which liability or compensation is regulated under nuclear conventions listed at Annex V.
Preventive Action (Article 5)

This article imposes a positive duty on operators to take preventative action to avoid environmental damage which has not yet occurred but of which there is an imminent threat.

Notwithstanding measures taken by the Operator if the risk still exists he/she must inform the competent authority of the relevant aspects of the situation.

The competent authority may, at all times:

- require the Operator to provide information on any imminent threat of environmental damage or in suspected cases of such an imminent threat
- require the operator to take the necessary preventative measures
- give instructions to the Operator to be followed
- take the necessary preventative measures itself, if it believes appropriate

If the Operator fails to comply with its obligations, or cannot be identified or is not required to bear the costs under the ELD, the competent authority may take these measures itself.

Remedial Action (Article 6)

If damage has occurred the Operator is obliged to inform the competent authority of all relevant aspects of the situation without delay and take all practical steps to control/contain/remove or otherwise manage the relevant contaminants and/or any other damage factors, in order to limit or prevent other environmental damage and adverse effects on human health or further impairment of services.

The competent Authority may

- require the Operator to provide supplementary information about any damage that has occurred
- take all practicable steps to control/contain/remove or otherwise manage the contaminants to limit or prevent further damage
- require the Operator to take such steps
- provide advices to the Operator concerning all such steps

Again, the Competent Authority may act itself if the Operator fails to comply, cannot be identified or is not liable under the ELD.

Determination of Remedial Measures

Annex II to the Directive sets out a common framework to be followed in order to choose the most appropriate means to remedy damage and is divided into two sections:

- Remediation of damage to water or protected species or natural habitats
- Remediation of land damage
An Operator shall identify potential remedial measures and submit them to the Competent Authority for its approval and the Competent Authority makes the final decision on the measures to be taken “with the co-operation of the relevant operation” as required. The Competent Authority can also prioritise which steps should be taken first - having regard to certain factors. Finally, the Competent Authority shall invite persons who are affected or likely to be affected by the environmental damage and the person on whose land the remedial measures would need to be carried out, to submit their observations and take them into account. Any decision taken pursuant to the ELD which imposes preventative or remedial measures shall state the exact grounds on which it is based.

Such decision should be notified forthwith to the Operator concerned, who shall, at the same time be informed of the legal remedies available to him/her under the laws in force in the MS concerned and of the time limits to which such remedies are subject.

### Prevention and remediation costs (Article 8(1))

An Operator shall bear the costs for the preventative and remedial actions taken, but with following exceptions:

- If the Operator can prove the environmental damage or threat of such damage was caused by a third party and occurred despite the fact that appropriate safety measures were in place
- If the Operator can show it resulted from compliance with a compulsory order or instruction emanating from a public authority (save where such an Order was a consequence of an emission or incident caused by the Operator’s own activities)

In such cases the Members State must indemnify them.

An Operator will also not be responsible if he was not at fault or negligent and the damage was caused by:

- An emission or event which was authorised by national laws (the permit defence)
- An emission or activity which due to the state of scientific or technical knowledge at the time it was not believed it would cause the harm (the state of the art defence)

A Competent Authority has discretion to recover, via security over the property or through other appropriate guarantees, the costs it has incurred in relation to the preventative or remedial actions. There is a limitation period of 5 years provided for within which time such costs are to be recovered from the date from which remedial works have been completed or the date the liable operator or third party has been identified (whichever is later).
Application of the ELD

The ELD requires operators to prevent an imminent threat of environmental damage and to remediate environmental damage where this does occur. Where environmental damage occurs, the operator is required immediately to take all practicable steps to control, contain, remove, or otherwise manage the pollutants or damage, to minimise the effects. In the longer-term, the operator is required to restore the environment to the condition it was in immediately before the event giving rise to the damage occurred. The ELD provides for a range of remediation techniques from minimal intervention through “natural recovery”, to active remediation.

The ELD provides that remedying of damage to protected species, natural habitats and water requires restoration of the environment to its baseline condition through primary and complementary remediation. Compensatory remediation may also be required.
# APPENDIX 2 - MAIN ELD RELATED INSURANCE PRODUCTS AVAILABLE AS IN SPRING 2008

<table>
<thead>
<tr>
<th>Insurance company</th>
<th>Policy type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GTPL</strong></td>
<td><strong>Traditional EIL</strong></td>
<td><strong>Stand-alone insurance</strong></td>
</tr>
<tr>
<td>AIG Europe S.A. - Sweden</td>
<td>Environmental Impairment Liability (EIL) insurance</td>
<td>Covers both sudden &amp; accidental (S&amp;A) as well as gradual pollution. No nuclear installations. Various incident and policy aggregate limits, consider sub-limiting certain coverage depending on risk, underwriting review and client needs.</td>
</tr>
<tr>
<td>AIG Europe S.A. Hungarian Branch</td>
<td>Environmental Impairment Liability (EIL) insurance</td>
<td>By issuing local policies, taking account of local transposition of the ELD. Both S&amp;A and gradual. No nuclear installations. Both accident and aggregate limits, considers sub-limiting defence costs.</td>
</tr>
<tr>
<td>Allianz - Slovenska poistovna, a.s.</td>
<td>Public Liability - Own site contamination</td>
<td>Waste management, underground storage, GMO:s are excluded</td>
</tr>
<tr>
<td>AXA Versicherung AG</td>
<td>Environmental damage insurance, additional product to Motor Insurance (Model: policy of GDV (German Insurance Association))</td>
<td>Does not cover use of GMO:s or release of sewerage sludge, liquid manure, plant protection product, fertilizers and insecticide, transport of dangerous goods by air.</td>
</tr>
<tr>
<td>AXA Winterthur</td>
<td>Traditional EIL No ELD adapted products. ELD does not apply in Switzerland. Special cover for cross-border emission under consideration.</td>
<td>Gradual pollution is only excluded if it results from normal operations. Not if it is a consequence of hazardous incident. Departure from classical notion of liability and complexity of possible losses and remedies would pose problems.</td>
</tr>
<tr>
<td>Generali-Providencia Zrt.</td>
<td>ELD provisions will be integrated into GTPL from 2009</td>
<td>Presently none of the listed activities in Annex III are included in existing GTPL-insurance, except waste transport. Liability for damages caused to third parties is covered, which according to Hungarian Law are borne by the insured.</td>
</tr>
<tr>
<td>Pool Español</td>
<td>Third party pollution liability, always</td>
<td>Mining as a main activity is excluded. The product is limited to Spanish operators, also</td>
</tr>
<tr>
<td>Insurance company</td>
<td>Policy type</td>
<td>Comments</td>
</tr>
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<td>-------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Swiss Reinsurance Company</td>
<td>Reinsurance and insurance coverage for ELD related risk transfer solutions in member states GTPL</td>
<td>Supporting/offering solutions which provide insurance coverage in countries where the ELD has been transposed into national law. Scope is limited to sudden &amp; accidental events. Coverage extension for specific gradual pollution events might be possible. Compensatory remediation is limited</td>
</tr>
<tr>
<td>UNIQA Insurance Company Hungary</td>
<td>Uniqa Perfect Environment Pollution Liability Insurance</td>
<td>Only claims occurred by &quot;common industrial activities&quot;, with exception of e.g. waste management, transport of dangerous or polluting goods. Their EIL covers only with a low indemnity limit in cases when property insurance is also covered. They do not plan to develop any products that involve specific ELD risks</td>
</tr>
<tr>
<td>UNIQA poist'ona a.s. Slovenská republika</td>
<td></td>
<td>Currently no finished products, development in progress (primary, complementary and compensatory remediation)</td>
</tr>
<tr>
<td>Victoria Versicherung AG</td>
<td>Coverage integrated into the GTPL products for SMEs with no significant environmental exposure</td>
<td>They cover all activities according to Annex III of the ELD. They do not cover operations of landfill sites, use and release of GMOs, and transboundary shipment and control of shipments of waste within, into or out of the EU. There is a basic policy limit for primary and complementary remediation, sub limits for compensatory remediation and damages on own premises. Coverage is for activities of German based clients/insureds carried out in Germany or other EU-countries</td>
</tr>
<tr>
<td>XL Insurance Company Ltd. London, XL Insurance, Global Risks Department</td>
<td>Sudden and accidental coverage integrated into GTPL</td>
<td>In general, coverage excludes compensatory remediation. Sub-limits on site cleanup measures</td>
</tr>
<tr>
<td>Insurance company</td>
<td>Policy type</td>
<td>Comments</td>
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</tr>
<tr>
<td><strong>Zurich Insurance Ireland Ltd.</strong>&lt;br&gt;<strong>Belgian Branch</strong></td>
<td>GTPL: Cover of sudden and accidental pollution (integrated cover)&lt;br&gt;Traditional EIL&lt;br&gt;Stand-alone insurance</td>
<td>Choice policy, specific cover for environmental damage/ environmental liability&lt;br&gt;Coverage for international policies with link to Belgium</td>
</tr>
<tr>
<td><strong>Allianz Versicherungs-AG Deutschland</strong></td>
<td>ELD related insurance policies are included under the existing reinsurance treaties covering GTPL, or motor business</td>
<td>Öko I : coverage for damages concerning the biodiversity, soil and water out of the insured’s premises.&lt;br&gt;Öko II : coverage for damages of biodiversity, soil and water (including ground water) manifested on the premises of the insured.&lt;br&gt;Öko III : coverage for claims and damages concerning the soil beyond the scope of the ELD, i.e. for claims based on the German Law (BBodSchG), which does not require a hazard for the human health. (stand alone)&lt;br&gt;All activities listed in Annex III apart from No. 2,10 and 11.</td>
</tr>
<tr>
<td><strong>AEGON HUNGARY Insurance Co.</strong></td>
<td>Environmental Liability Insurance integrated into GTPL</td>
<td>In principle providing cover for all type of activities. However, the clients’ exclusion lists (in their reinsurance treaties) tend to focus on business activities. Cover is provided for damage to groundwater or resulting from an alteration of subterranean stores of groundwater or to flow patterns. GMOs are not covered</td>
</tr>
<tr>
<td><strong>Partner Reinsurance Europe Limited, Zurich Branch</strong></td>
<td>ELD related insurance policies are included under the existing reinsurance treaties covering GTPL, or motor business</td>
<td></td>
</tr>
<tr>
<td>Insurance company</td>
<td>Policy type</td>
<td>Comments</td>
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</tr>
<tr>
<td><strong>GTPL</strong></td>
<td><strong>Traditional EIL</strong></td>
<td><strong>Stand-alone insurance</strong></td>
</tr>
<tr>
<td>AIG EUROPE - Spain</td>
<td>EIL Insurance, offered on a stand-alone basis but can be combined with GTPL products, or other insurance offerings</td>
<td>EIL insurance can apply to all, the extent of application being subject to underwriting and additional premiums</td>
</tr>
<tr>
<td>AIG EUROPE - France</td>
<td>Idem</td>
<td>Idem</td>
</tr>
<tr>
<td>AIG EUROPE - Italy</td>
<td>Idem</td>
<td>Idem</td>
</tr>
<tr>
<td>AIG EUROPE - Finland</td>
<td>Idem</td>
<td>Idem</td>
</tr>
<tr>
<td>AGF Division AGCS</td>
<td>TopAZ is a stand-alone policy for the environmental risks coming from plants. Our product includes coverage for Civil Liability in case of pollution and a specific coverage for Regulatory Liability. TopAZ pro is giving the same coverage than TopAZ with the addition of a professional liability in case of pollution damages occurred in the course of professional activity.</td>
<td>Are not covered in product the following risks: Small and Medium size companies; Auto Liability; Marine Liability; Aviation Liability. Transport Liability. These risks can be covered by another department of the Company. Totally excluded: all damages due to GMO and Asbestos</td>
</tr>
</tbody>
</table>
11.3. APPENDIX 3 – SELECTED ELD-RELEVANT PRODUCTS CURRENTLY IN THE MARKET

Box 14 - CARE by Assurpol (FR)

It offers the contract named CARE (Insurance Contract of Environmental Risks). This contract includes a third-party liability coverage in industrial sites, which was broadened by the ELD. It covers civil liability to third-parties for material damage and personal injury. The reimbursement ceiling is limited to €50 million. Financial loss coverage is added for prevention and remedying of environmental damage costs. However, this coverage is restricted to fortuitous events caused in the boundaries of the insured’s site. The policy does not cover the following activities:

- Damage as a result of permitted emissions
- Development risk
- Intentional acts
- Asbestos
- Genetically modified organisms

Most members of Assurpol use this policy and propose additional blocks (the additional responsibilities not being reinsured by the pool).
Box 15 - ACE UK Environmental insurance policies (Harrington, 2008)

ACE UK proposes 2 types of Environmental insurance policies to provide coverage for pollution-related claims arising under the ELD:

- Premises Pollution Liability (PPL): claims made policy offering a range of cover sudden and accidental pollution resulting from the ownership, control and/or operation of premises. In particular, it covers bodily injury, property damage and clean up costs of pollution emanating from the insured site and that has migrated beyond the boundaries of the insured’s site (including on-site coverage). It does also cover losses due to business interruption.

- Contractors Pollution Liability (CPL): Offering pollution (sudden and accidental) liability protection to insured contractors and subcontractors. Provides coverage for bodily injury, property damage, remediation costs and legal defence expenses arising from the operations and completed operations of the contractor.

ACE has a broad definition of biodiversity, which draws upon their extensive experience with natural resource damage in our US wordings.
Box 16 - ECOSPHERE

AXA Corporate Solutions, a unit of AXA S.A., based in France, has recently developed ECOSPHERE, which includes coverage for liabilities created by the ELD. This product was the first in France to fully cover the requirements of the Directive and is expected to be rolled out in other European countries soon.

The ECOSPHERE range combines civil liability cover, protecting third parties both on and off site, with a "damages" section to protect the policyholder's assets. More specifically, this is based on limiting any worsening of environmental damage and on stopping damage from spreading by providing flexible and rapid emergency compensation measures (AXA, 2008). In particular, ECOSPHERE covers liability to third-parties for accidental and/or gradual environmental impairment, paying emergency costs to avoid or mitigate claims, and for losses due to business interruption if a site is partly or totally shut down. There is optional coverage available for the EU, including expenses to prevent or minimize damage, costs to restore, rehabilitate or replace damaged natural resources, or to provide equivalent alternative resources (Business Insurance Europe, 2007).

Another feature in ECOSPHERE taken from Assurpol (French pool) is capacity of €50 million per claim per insurance period, plus €10 million in additional coverage for costs linked to the ELD administrative orders, for €60 million in total. ECOSPHERE does not cover damages resulting from dangers unknown when a product or substance is developed. Other exclusions include asbestos, electromagnetic fields, and genetically-modified organisms.
Box 17 - AIG EnviroPro (AIG, 2008)

AIG has released an environmental liability policy targeted at a wide range of commercial, manufacturing and industrial sites.

This product fills common gaps in general liability cover such as clean-up costs and losses arising from gradual pollution.

The policy also covers restoration of third-party sites, mitigation of pollution costs, third-party bodily injury and property damage, with optional extras such as first-party business interruption losses, transportation-related environmental liability and contractor operations-related risk.

Box 18 - TopAz by AGF

TopAz was launched in June 2007 in response to the request made by several “large risk” clients of AGF to provide an insurance product to meet extended environmental requirements. This product is particularly design for companies with a total turnover above €500 million, being present in different countries worldwide and needing an international insurance programme.

TopAZ is a stand-alone policy for the environmental risks coming from plants. This product includes coverage for civil liability in case of pollution and a specific coverage for regulatory Liability. It does cover primary, complementary and compensatory remediation. TopAZ pro is giving the same coverage than TopAZ with the addition of a professional liability in case of pollution damages occurred in the course of professional activity.
Box 19 - Environmental Liability Insurance proposed by the members of the Pool Español de riesgos medioambientales (Heras, 2008)

The members of the Pool Español de riesgos medioambientales offer different options for Environmental liability: as additional coverage on a facultative basis, or GTPL always written as a stand-alone policy.

The most common model of policy, recently drafted by the pool and commercialised by the pool members, adapted to the Spanish law, covers pollution resulting from the ownership, control and/or operation of premises that are insured. In particular, it covers property damage and mediation costs (primary, complementary and compensatory) of pollution emanating from the insured site. The policy offers three facultative modules a being mandatory:

- Environmental liability for pollution affecting species, water resources and soil (in the case of soil, only off-site pollution). It covers the clean-up and costs of introducing measures to prevent imminent pollution.
- Environmental liability for soil pollution (for onsite pollution), covering the clean-up.
- Civil liability for pollution, covering bodily injury and third party material loss.

There are certain exclusions including damages resulting from noise or electromagnetic fields, or changes in the water quantity of aquifers and superficial waters due to extractions. It is limited to “pollution” incidents and excludes wilful incidents and normal operations, as well as the deliberate non-compliance with regulations.
Box 20 - USV-Model

The USV-Model is a stand-alone concept restricted to sudden, accidental, unexpected and unintended incidents. The insured claims are:

- Direct claim of the competent authority
- Claims of third party who recourses the emerged remediation costs

For those claims, the insured costs are:

- Primary, complementary and compensatory restoration
- Prevention of imminent damage
- Minimization costs

The coverage in time is limited to the first verifiable discovery of damage during the insurance period. Yet, the USV model does not insure regular maintenance, re-fitting and repair.

Some damages such as damages to biodiversity in the boundaries of the insured’s site or damage to the underground water are insurable under specific endorsement.

The following damages are excluded:

- Result of unavoidable, necessary or accepted environmental impacts
- Intentional acts
- Mining operations and permanent storage of waste
- Asbestos
- Genetically modified organisms

It has been estimated that this model could have an acceptance of up to 95% in 2010 (GDV, 2008).