



**LIABILITY FOR ENVIRONMENTAL
DAMAGE IN EASTERN EUROPE,
CAUCASUS AND CENTRAL ASIA (EECCA):
IMPLEMENTATION OF GOOD
INTERNATIONAL PRACTICES**



EAP Task Force

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This report is also available in Russian under the title:

ОТВЕТСТВЕННОСТЬ ЗА УЩЕРБ ОКРУЖАЮЩЕЙ СРЕДЕ В СТРАНАХ ВОСТОЧНОЙ ЕВРОПЫ, КАВКАЗА И ЦЕНТРАЛЬНОЙ АЗИИ (ВЕКЦА): Применение лучшего международного опыта

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EXECUTIVE SUMMARY

The economic implications of weak environmental liability regimes are multiple and substantial, including the need for public financing of environmental remediation activities, increased spending on public health, loss of competitiveness because of work force migration out of polluted areas, loss of ecosystem functions, etc. This report aims to assist countries of Eastern Europe, Caucasus and Central Asia (EECCA) to streamline their systems of environmental liability, thereby implementing more amply and effectively the Polluter Pays Principle. More specifically, the report compares the concepts and existing practices in OECD and EECCA countries and provides recommendations on reforming liability provisions for environmental damage in the EECCA region.

Liability for environmental damage in most OECD countries is understood as an obligation for the responsible party to bear the costs of restoring the environment. This obligation, under the strict liability regime primarily applied in OECD countries, does not require proof of negligence or regulatory non-compliance. The remediation is usually conducted by the party responsible for the damage under an administrative or court order, in accordance with a specific clean-up project. In a public health or environmental emergency, public authorities can directly proceed with remediation and then recover the remediation costs from the liable parties.

The assessment of environmental damage in OECD countries is primarily based on resource equivalency analysis to estimate the needs and costs of restoring affected resources or environmental services. The remediation scope may be mandated by law or left to the discretion of the competent authority, which determines specific measures using criteria such as technical feasibility, effectiveness and efficiency.

Environmental liability in EECCA only applies if environmental regulations have been breached (the fault standard). Liability is triggered by violation of environmental standards, even in the absence of proof of environmental damage. Although some important legal changes are being introduced in EECCA, most notably in Russia, environmental liability in EECCA remains focused on calculating and collecting monetary compensation for the state (essentially serving as a penalty) rather than on preventing and correcting the damage. There is very little regulatory guidance on how to assess the extent of the damage, needs and costs of remediation, and how to select clean-up measures.

Financial security instruments such as environmental insurance help to implement liability provisions if the responsible party does not have adequate funding to carry out required remedial actions. Whether buying environmental insurance is voluntary or obligatory for the operator, insurance companies always carefully evaluate the risk to be covered and usually stimulate risk prevention measures through premium reductions or broader coverage. However, factual and legal uncertainties of assessing environmental damage have led to the slow development of an environmental insurance market in OECD countries. The environmental insurance schemes introduced in a few EECCA countries are not working mainly because of the lack of large damage remediation claims that would create a real need for financial security.

The comparative analysis of the environmental liability practices in OECD and EECCA countries suggests that EECCA decision-makers should give priority to the following reforms in implementing international good practices in the region:

- Re-orient liability requirements toward the restoration of the damaged environment;
- Introduce strict environmental liability, at least with respect to hazardous industrial activities;
- Conduct environmental damage assessment primarily based on the needs and costs of restoring the affected natural resources or environmental services; and
- Implement and enforce the improved environmental liability regime before introducing related financial security requirements.

Enhanced international cooperation between policy makers and experts in OECD and EECCA countries would be beneficial in implementing these reforms.

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This document was prepared within the framework of the EAP Task Force (Task Force for the Implementation of the Environmental Action Programme). The mission of the EAP Task Force is to facilitate and support environmental policy reform in the countries of Eastern Europe, Caucasus and Central Asia (EECCA). Established in 1993 as part of the “Environment for Europe” process, the EAP Task Force brings together policy-makers and experts from EECCA and donor countries, international institutions and other stakeholders. The OECD serves as its Secretariat.

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The views expressed in this report are those of the authors and do not necessarily reflect those of the OECD or its member countries.

1. INTRODUCTION

1.1 Background

Industrial and commercial activities generating environmental pollution are often associated with the risk of contaminating environmental media and degrading ecosystems, causing human health problems, damaging property, and affecting biodiversity. In mature environmental regulatory systems, this risk translates into the legal liability risk of the owners and operators of such activities for the consequences of damaging the environment.

Environmental liability is one of the means of making polluters pay (and take action more generally) for preventing, remediating, or compensating environmental damage they cause. In economic terms, this means imposing internalisation of pollution externalities. Therefore, environmental liability is an important instrument of the implementation of the Polluter Pays Principle. A well-designed environmental liability regime is also a significant deterrent against non-compliance with regulatory environmental requirements.

Financial security mechanisms such as insurance are increasingly used to protect potentially responsible parties from the heavy burden of damage remediation or compensation costs. At the same time, experience from the US, with its long-established liability regime, shows that even high-risk sectors have been able to absorb the costs of insurance and other liability-related expenditure without any significant impact on competitiveness. Moreover, environmental liability regimes contribute to innovation by encouraging businesses to develop and use environmentally safe technologies and processes.

While environmental liability issues are well-rooted in the US legal system and are gaining visibility in the European Union in the context of implementation of the EU Environmental Liability Directive (2004/35/EC), this system remains underdeveloped in countries of Eastern Europe, Caucasus and Central Asia (EECCA). In EECCA, environmental liability regimes are focused on assessing environmental damage for purposes of monetary compensation (essentially serving as a penalty) rather than on correcting the damage, limiting its impacts, and preventing further damage. Competent authorities must rely on methodologies for assessing damage that are largely theoretical in nature.

1.2 Objective, Scope and Structure of the Document

This document was developed in response to requests from environmental authorities in EECCA countries which are eager to improve their environmental liability systems, particularly to be able to tackle the need for huge investments to clean up past pollution. *Its objective is to encourage and prepare reforms of environmental liability provisions which are necessary to re-orient them toward the ultimate goal of restoring the damaged environment.*

This document focuses exclusively on liability for damage to the environment, including reduced biodiversity and other damage to natural resources such as land, groundwater and surface waters (referred to hereinafter as environmental damage). It does not address liability for damage to human health or private economic interests, which is often referred to as ‘traditional’ liability; neither does it cover health and property damage valuation techniques.

The paper presents a comparative analysis between the concepts and existing regimes of environmental liability in OECD and EECCA countries. It synthesises the overview of key approaches to environmental liability in OECD countries, based primarily on the analysis of the legal systems and practices in the United States and the European Union, that was prepared by the EAP Task Force Secretariat (OECD, 2009) and the review of current EECCA practices in this domain conducted by EECCA Regional Environmental Centres (REC, 2011).

In particular, the document addresses the following issues:

- Coverage, different types and legal requirements as well as limitations of the existing environmental liability regimes (Chapter 2);
- Assessment of environmental damage for the purpose of its remediation or monetary compensation (Chapter 3);
- Design and constraints of environmental liability insurance and other tools to provide financial security for parties potentially liable for environmental damage and to encourage prevention of such damage (Chapter 4); and
- Conclusions and recommendations for decision-makers in EECCA (Chapter 5).

2. LEGAL FRAMEWORK FOR ENVIRONMENTAL LIABILITY

Environmental liability is the term used for the process through which the financial responsibility for environmental damage is transferred back to those who cause the damage. Once the object of liability (environmental damage) and the mechanisms of its implementation (obligation to remediate or compensate the damage) are defined, the crucial issue is the assignment of responsibility for the damage. This chapter compares how these key features of environmental liability regimes are established in the legislation and implemented in selected OECD and EECCA countries.

2.1 Definition of Environmental Damage

Environmental damage is defined differently in different legal systems. The EU's Environmental Liability Directive (ELD, 2004/35/EC), transposed effectively by all EU Member States as of July 2010, defines environmental damage as damage (harm) to protected species and natural habitats, water (within the scope of the EU Water Framework Directive) and land, if its contamination threatens human health. In the US, the definition of damage to the environment is that of costs related to response actions associated with the inflicted harm. US law talks about "damages for injury to, destruction of, or loss of natural resources, including the reasonable costs of assessing such injury, destruction, or loss"¹. The US definition of natural resources is broad in scope and encompasses not only more commonly considered resources such as land, surface waters, wildlife and fish, but also air, groundwater, drinking water supplies and any other resources. However, it is limited to government-owned resources (as opposed to private property, damage to which is part of traditional liability). Both definitions are implicitly linked to the potential for damage remediation.

Conversely, the historic focus of environmental liability in EECCA has been on the fact of harm: if any harm has been inflicted on the environment (including air), it should be compensated financially to the state even when the natural resource or environmental service cannot be directly restored. By extension of this logic, an environmental liability event in EECCA countries is defined not just as deterioration of ambient environmental quality but as exceedance of an emission or effluent limit (which theoretically defines the threshold of harm). For example, according to Moldova's "Methodology for Assessing Environmental Damage Caused by Violation of Water Legislation" (Art. 9 and 10), damage compensation is due if the quality of the receiving water body has deteriorated for at least one pollutant, but also if the effluent exceeds the allowable limits irrespectively of whether any actual damage has been inflicted by such violation².

The notion of environmental damage had not been clearly defined in EECCA countries until very recently. Russia's draft Federal Law "On amendments to certain legal acts of the Russian Federation (in relation to the regulation of liquidation of environmental damage, including that caused by past economic activity)" defines environmental damage as monetary value of the harm to the environment. Potentially creating an important legal precedent, reparation of the harm is defined as *restoration* of impaired environmental conditions through remediation measures or monetary compensation.

¹ Comprehensive Environmental Response, Compensation, and Liability Act, Section 107(a)(4)(C).

² Decree of the Ministry of Environment of the Republic of Moldova No. 163 of 07.07.2003.

Environmental liability may also cover transboundary environmental damage, mostly from air and water pollution. For example, the UNECE Protocol “On civil liability and compensation for damage caused by the transboundary effects of industrial accidents on transboundary waters” (2003 Kiev Liability Protocol to the 1992 Water Convention) addresses the issue of financial responsibility for actually taken or planned measures of ‘reinstatement’ of impaired transboundary watercourses. This Protocol has been signed by Georgia, Moldova and Ukraine, but no EECCA country has ratified it.

2.2 Requirements for Damage Remediation and Compensation

Environmental damage remediation and compensation can be imposed under *administrative or civil law*. Under an *administrative liability regime* (e.g. as established by the EU ELD, Box 1), preventive and restorative measures are mandated by a competent government authority without prior court adjudication. In a *civil liability system*, the government acts as a plaintiff in a court which assigns responsibility for the damage and determines the extent of the responsible party’s liability. The US has a mixed system containing civil liability rules as well administrative powers that allow the US Environmental Protection Agency to issue compulsory clean-up orders, backed by the threat of severe fines for non-compliance. EECCA countries similarly base their environmental liability regimes on such a mixed system.

Box 1. Administrative Liability: Example of the EU Environmental Liability Directive

The ELD imposes administrative liability for damage to protected species and habitats, for contamination of land and for damage to surface waters, coastal waters, and groundwater. The ELD covers only significant environmental damage, defined as follows:

- Damage to protected species and natural habitats is recoverable if it has “significant adverse effects on reaching or maintaining the favourable conservation status” (also defined in the Directive) of the habitats and species concerned.
- Damage to the waters is covered if it “adversely affects the ecological, chemical and/or quantitative status and/or ecological potential” of these waters.
- Land contamination can only be claimed for if it creates a significant risk to human health.

The Directive does not address nuclear energy-related damage and oil pollution damage caused by oil transporting ships which fall under a number of international conventions. The ELD is not retroactive: it does not apply to environmental damage caused by an emission or incident that occurred before its effective date of 30 April 2007.

According to the Directive, where environmental damage has not yet occurred but there is an imminent threat of such damage occurring, the competent authority should either require the operator to take appropriate preventive measures or do so itself. Where environmental damage has occurred, the competent authority should either order the operator to take necessary restorative measures or take such measures itself (e.g., when the responsible party cannot be identified or fails to act) and recover their costs from the operator within five years of taking the remediation actions. The Directive does not limit the costs that a liable polluter may incur to remedy the environment.

Under the ELD, only government authorities can require the operator to take remediation measures or recover the costs of taking such measures themselves. Persons or public interest groups representing them have a right to request that the competent authority take action and to initiate legal proceedings to review the authority’s response.

Source : EU, 2004.

Environmental damage can be identified through a variety of means. In addition to regular site inspections by an environmental enforcement authority, information may be obtained from accident notifications from operators, routine self-monitoring reports, environmental quality monitoring data or citizens' complaints. The identification of contaminated sites with historic damage can take place on the occasion of an application for a building or operation permit or a transfer of ownership of the site.

Once damage is identified, an initial investigation is conducted to evaluate its extent. For example, Lithuania uses a two-step approach divided into a preliminary investigation (impact assessment) and a detailed investigation to determine the significance of the environmental damage (REMEDE, 2007b). However, there are no general criteria of the "severity threshold" in most EU countries. Competent authorities use "professional judgement" to determine the significance of the damage on the case-by-case basis. In the US, formal site scoring is conducted using the US Environmental Protection Agency's criteria and scoring procedures set forth in the hazardous ranking system. Among the criteria applied are toxicity of the substances, the location of potential receptors, exposure pathways, threats to human food chain and the environment. Sites with a score above a certain threshold are put on the National Priorities List.

Reparation of environmental damage in most OECD countries is understood not as a monetary penalty payable by the responsible party to the government but either as remediation measures undertaken by the responsible party or as the reimbursement by the responsible party of the costs of such measures borne by the government. The policy objective is not to punish the operator who caused the damage but to restore the environment, which is reflected in specific requirements imposed by the law on liable parties.

The remediation is usually conducted by the party responsible for the damage under an administrative or court order, in accordance with specific clean-up and restoration project conditions. In cases of public health or environmental emergency, non-compliance with remediation orders, or uncertainty about responsible parties, public authorities in most OECD countries can directly proceed with remediation and then use civil liability provisions to recover the remediation costs from the liable parties. The evaluation of remediation project results is always carried out by the competent government authority.

The legislation in EECCA countries establishes the primacy of monetary compensation of the harm to "in-kind" environmental remediation by the responsible party (albeit the latter can be ordered by a court *along with* a monetary compensation). Most often, such monetary compensation goes to the state budget without any guarantee that it will be spent on environmental remediation. In Moldova, the responsible party can pay monetary compensation to the Environmental Fund or conduct environmental measures for the amount equal to the value of the damage (calculated using a complex formula), not necessarily related to remediating the inflicted damage. Following the same logic, state-owned enterprises in Uzbekistan are exempted from monetary compensation of environmental damage (REC, 2011). Existing EECCA legal acts do not specify operator's obligations to take necessary measures to prevent environmental damage.

The new draft Russian law on environmental damage marks a significant change in this approach by emphasising remediation. According to its provisions, the government authority at the administrative level (federal, sub-national or municipal) corresponding to the ownership of the site would approve remediation projects submitted by the operator responsible for the damage or, if the responsible party cannot be identified or is insolvent, would directly manage appropriate remediation activities. The completion of a remediation project should be certified by the competent government authority that initially approved it.

Furthermore, the draft law recognises the "technical impossibility" of remediating environmental damage from air pollution, contamination of surface water (if pollutants cannot be removed) and groundwater, as well as irreversible destruction of animals, plants or ecosystems. In those cases, the competent government authority would obtain monetary compensation from the responsible party and use it to conduct "equivalent environmental protection measures".

2.3 Strict or Fault-based Liability

In determining the features of a liability regime, the first choice that legislators face is between *strict liability* and a *fault-based* standard. Strict liability does not require proof of negligence or violation of regulatory requirements.

A fault-based standard provides appropriate incentives to potential responsible parties only with respect to the level of care (the diligence in performing a given activity) but not with respect to the nature and level of polluting activity. A strict liability standard forces the operator to consider both the level of care and the nature and level of activity, creating additional incentives for good corporate environmental management, at least with respect to hazardous activities.

Strict environmental liability was first applied in the US (Box 2) and is gaining ground in other OECD countries. It is imposed by the EU ELD for operators engaged in dangerous activities listed in Annex III of the Directive³ (a fault-based standard is applied to biodiversity damage caused by all other operators). Some European countries (e.g., Italy and Poland) historically used fault-based liability but had to change their systems to comply with the ELD. The Kiev Liability Protocol (see Section 2.1) provides for strict liability for industrial accidents within certain financial limits and for unlimited fault-based liability.

Box 2. Strict Liability: Example of the United States

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, 1980) imposes on a wide range of “potentially responsible parties” (current owners and occupiers, past owners and occupiers, hazardous substance generators and transporters) strict, retroactive without restriction, joint and several liabilities for response costs, including costs of environmental clean-up and restoration.

Similarly, the Oil Pollution Act (OPA, 1990) imposes strict liability for a wide range of types of damage from an oil spill into the water from vessels or stationary facilities. A responsible party is liable for all removal costs incurred by the government at any administrative level or private individuals or organisations. In addition, OPA makes a responsible party liable for the damage to natural resources, real estate or personal property, subsistence use of natural resources, revenues, profits and earning capacity.

Source : OECD, 2003.

However, a strict liability regime can be weakened by different mitigating factors. The ELD states that operators can, subject to national legislation, invoke “permit defence” (when the harmful activity was legally permitted or licensed, and the operator can prove compliance with all permit/licence conditions) or “state of the art defence” (proving that the harmful activity was not considered likely to cause the damage according to the state of contemporary scientific and technical knowledge) to avoid liability⁴. It is also common that operators are not liable for the cost of preventive or restorative measures taken when the environmental damage or imminent threat thereof is the result of compliance with a compulsory order, instruction or other legally binding or compulsory measure emanating from a public authority.

³ ELD Annex III defines dangerous activities as those subject to an integrated permit, a water abstraction, wastewater discharge or a waste management permit, or a licence for handling dangerous substances and waste.

⁴ Among EU Member States, Austria, Bulgaria, Germany, Hungary, Ireland, the Netherlands, Poland, Romania and Slovenia have decided not to allow such liability defences. Denmark, Finland and Lithuania allows only the permit defence, while France allows only the state of the art one. In Sweden, both are just mitigating factors in the decision process.

In EECCA countries' legal systems, environmental liability is predominantly fault-based. The exception is strict liability for hazardous industrial activities: for example, the Environmental Code of Kazakhstan (Art. 321-5) states that "citizens and legal entities engaged in an environmentally hazardous activity must compensate the damage they cause unless they prove that it was caused by *force majeure*". However, these strict liability norms are seldom applied in practice.

2.4 Joint or Proportional Liability

Another dilemma in designing an environmental liability regime arises where multiple polluters have contributed to the damage: should the liability be imposed on an individual basis (proportional liability) or should all the polluters be held responsible for entire damage ("joint and several" liability)? The US system is a clear example of joint and several liability: competent authorities pursue any entity that may be only partially liable for the clean-up costs. From an operator's perspective, this approach increases the probability of being liable to pay. However, if liability is not proportional, incentives for accident prevention may not work properly, preventing the potential polluter from performing a correct costs-benefits analysis.

In the EU, each Member State can decide whether liability should be joint and several or proportional. Most countries have opted for joint and several liability, with only a few (e.g. Denmark, Finland and France) stipulating proportional liability. Still, even if joint and several liability is adopted as a general rule, the polluter most often has the possibility to limit his financial exposure by proving the extent of his contribution.

Civil law in EECCA countries provides for joint liability, while in terms of remediation of real environmental damage on the ground this issue has not yet been legislatively addressed. The current EECCA practice of monetary compensation as a function of exceedance of the permitted pollution limit is based on each operator's compliance with regulations.

2.5 Special Liability Regimes for Historic Damage

There is no fundamental legal distinction between liability for new as opposed to historic (residual) environmental damage. The principal difference is whether a responsible party can be identified and how remediation is paid for. In EECCA, historic soil damage is often treated as an independent issue, largely due to the legacy of heavy pollution from state-owned enterprises during the Soviet era and the liability challenges that emerged in connection with their bankruptcy or privatisation. Essentially, however, the questions to be resolved are those of identification of liable parties and financial responsibility.

If a causal relationship to a responsible party cannot be established or the responsible party is insolvent, the prevalent approach in most OECD countries is to hold the person with factual control of the contaminated property responsible for clean-up costs. Among the arguments for holding the current owner or operator liable is that he is the party with the legal responsibility to control any risks presented by his land and to take precautionary measures, if necessary. Another argument is that the current owner has the access to the land that is needed for carrying out any necessary clean-up.

If the current owner or operator did not cause the damage, he almost always has the right of recourse, i.e. the freedom to sue other parties to recover costs of any of the damage which they may have caused. Where several parties may be held liable, many countries have a "cascade system" where the operator who caused the pollution in the first place is in the first line of liability, and the owner of the contaminated property is required to pay for remediation only if the polluter cannot be identified (Box 3).

In the case of ownership change, the basic rule is that all liabilities are transferred to the new land owner. This is a powerful incentive for each prospective buyer to take all due care to ensure that he is fully informed of the condition of the property before the transaction. A number of countries (e.g. Belgium) allow the “innocent landowner” defence, i.e., the possibility for the current owner to avoid liability for remediation if he can show that he did not cause the damage and was not aware of it at the time when he acquired the property. A growing trend in EU countries is to inform the buyer of the condition of the property by means of a register of contaminated lands. Such registers are composed based on the examination of potentially contaminated areas at the time of permit renewal, decommissioning of a permitted installation, or a transfer of an ownership title⁵.

Box 3. Comparison of Approaches for Assigning and Transferring Liability for Historic Damage

In the Netherlands, clean-up of pollution caused before 1975 is considered a public responsibility to be paid out of public funds. The courts have decided that operators should pay for cleaning up any pollution caused after that date. In Germany, the current owner is responsible for clean-up if the property was acquired before March 1999, while the prior owner is responsible if the property was transferred thereafter.

Most Central and East European countries recognise some form of state responsibility for pollution caused during the period of state ownership. For example, the Czech Republic has set up a system for new owners to be reimbursed out of state funds for any clean-up actions agreed in advance with environmental authorities. The Czech Republic has also established policies and measures whereby historic pollution problems were identified in advance (through environmental audits) along with any remediation measures considered necessary by environmental authorities.

Poland took the position that all environmental liability should be transferred to the new owner along with the property title. If the prospective buyer had informed himself about any environmental problems related to the site, he could seek to limit future liabilities either by setting aside part of the purchase price for reimbursement of remediation costs or through insurance.

The draft Russian law on environmental damage defines “environmental damage related to past economic activity” as harm to the environment inflicted on state or municipal-owned land not currently used for economic activity, where the responsible party cannot be identified or taken to justice. It places the ultimate remediation and financial responsibility upon the appropriate government authority. On the other hand, in Kazakhstan, if the responsible party cannot be identified, liability is imposed on the current owner or user of the natural resource.

Source : World Bank, 2007

Where liability cannot be assigned, the government must still ensure that the necessary preventive or restorative measures are taken. These are not just cases of “orphan sites” with historic contamination, but also those of damage caused by diffuse pollution and/or by authorised pollution releases, where the fault-based standard is applied. Where the government may end up being responsible for damage clean-up costs, it is advisable to establish and maintain some kind of remediation and compensation fund (Box 4).

⁵ Russia’s draft law on environmental damage envisages the creation of a state register of contaminated lands to include detailed information on the causes and degree of the damage.

Box 4. Supplementary Financial Mechanisms for Environmental Remediation

Finland's Environmental Damage Insurance Act of 1998 created a fund whose aim is to guarantee full compensation for environmental damage, including the costs of measures taken to prevent or limit the damage and to restore the environment to its previous state, in cases where those liable for compensation are insolvent, or the liable party cannot be identified. The scheme is financed by special premiums which are compulsory for operators of high-risk activities subject to environmental permits.

In the US, CERCLA's extremely stringent liability regime is combined with a collective funding mechanism in order to deal with the highest priority hazardous waste sites. The statute established a trust fund, better known as the Superfund, which is sustained by various fiscal impositions, such as a petroleum tax, a tax on polluting activities of major enterprises and a tax on producers of those chemicals that typically compose hazardous waste. Since the abolition of the tax on polluting activities in 1994, the programme has been partly financed by a federal grant.

In France, the remediation of abandoned lands is funded by revenues of the tax on industrial hazardous waste introduced in 1995.

Dealing with past liability issues in EECCA is made more difficult by the lack of clear ownership of contaminated sites ("orphan" sites). Several governments, e.g. in Azerbaijan, Moldova and Kazakhstan, assign high priority to cleaning up such sites. For example, Moldova has established a register of pesticide-contaminated land.

3. ASSESSMENT OF ENVIRONMENTAL DAMAGE

The obligation for the polluter to pay for the damage he has caused to the environment forces him to fully internalise the negative externalities of his activity. However, it poses the challenge of quantification of environmental damage. In particular, the issue of quantification is extremely controversial with respect to the value of natural resources or other environmental services that cannot be fully restored or replaced after the occurrence of a polluting event.

Many OECD countries struggle with this challenge. A major reason for the delay in the EU ELD's transposition in all but four Member States beyond the deadline of 30 April 2007 until its effective completion on 1 July 2010 was the difficulty of integrating economic valuation of environmental damage into the national regulatory framework⁶.

Generally, two approaches can be used to calculate the amount of required damage compensation:

- 1) Determining the monetary value of the damage; and
- 2) Assessment of the adequate scale of environmental remediation needed to compensate (in real rather than monetary terms) for the harm, with the subsequent determination of the respective costs.

This chapter gives an overview of specific methods under both approaches.

3.1 Economic Valuation of Environmental Damage

There are several methods to measure the economic value of natural assets (OECD, 2006):

- **Hedonic pricing:** The method is used to estimate economic values for environmental services that directly affect market prices. It is most commonly applied to variations in housing prices that reflect the value of local environmental conditions. For example, all other factors being equal, a home near a contaminated site costs less than one some distance away, so the difference in housing costs provides an estimate of the loss in value because of the contamination.
- **Travel cost method:** The travel cost method estimates economic values associated with ecosystems or sites that are used for recreation by assuming that the value of a site is reflected in how much people are willing to pay to travel to visit the site. People's willingness to pay to visit the site can be estimated based on the number of trips that they make at different travel costs.
- **Stated preference techniques:** Contingent valuation and choice modelling techniques are survey-based methods for the valuation of non-market resources, where questionnaires are designed to elicit the respondents' willingness to pay for the provision/conservation of a given environmental asset directly, or willingness to accept compensation for the loss of an environmental asset.

⁶ In the EU, national guidelines on environmental damage assessment had been adopted as of late 2009 only in Denmark and the UK and were under development in several other Member States (BIO, 2009).

The measurement of values placed by humans on resources in accordance with these methods is not used very frequently in practice. Some of the proposed monetary evaluation criteria, such as the contingent valuation method and the travel cost method, can be extremely subjective and may lead to almost unpredictable results. Moreover, the common feature of all these methods is that they are not well suited to measure non-use values such as those of biodiversity⁷. Because of the dissatisfaction with the difficulties of these valuation approaches, resource equivalency methods were developed in the 1990s.

3.2 Assessment of Remediation Needs and Costs

Estimating environmental damage in OECD countries is predominantly based on the assessment of the needs to restore affected resources (e.g., area of habitats, number of species, etc.) or the services they provide (e.g., water supply, recreation). Annex II to the ELD also states a clear preference of resource equivalency approaches over monetary valuation. This is primarily because technical clean-up requirements can be determined by competent environmental authorities with sufficient clarity, stability and predictability.

Remediation cost assessments are also preferred by courts to other valuation methods for a number of reasons. While market-based estimates of damage to fish, timber and other highly marketable natural resources are generally accepted, indirect valuation methods are most often subject to theoretical arguments between the plaintiff and the defendant that are difficult for a court to resolve. Cost estimates of remediation projects, once their scope has been justified, are much more persuasive. In addition, the risk of liability for remediation costs is much easier to absorb for the insurance sector (see Chapter 4).

Types of remediation

The significance of the damage has to be assessed with reference to the *baseline condition* of the environmental media or ecosystems concerned. The baseline condition is defined in the ELD as “the condition that would have existed had the environmental damage not occurred, estimated on the basis of the best information available”.

Environmental damage can be assessed with regard to primary, complementary and compensatory remediation.

- *Primary remediation* entails actions to reduce or remediate site-specific damage, usually through removal of released polluting substances or actions to reduce their ongoing discharge. Primary remediation aims at returning the damaged natural resources or services to their pre-incident, or baseline, condition, but this may not always be possible.
- *Complementary remediation* may have to be done either at the site of the incident by improving or creating alternative (to the damaged ones) resources or services or at an alternative site by improving natural resources/services of the same or comparable kind, if full on-site remediation is impossible.
- Because it takes time to remediate the impacted natural resources and services to the baseline condition, *compensatory remediation* is needed to compensate for losses from the time when the damage occurred until recovery to baseline conditions (“interim losses”). However, the practical implementation of compensatory remediation is still very rare. In Germany, procedures for measuring interim losses with economic methods exist, but have not yet been applied in practice. Nevertheless, this is often done implicitly by the experts when defining adequate compensation measures.

⁷ For a discussion of the determination of monetary value of biodiversity, see OECD (2002a).

The operator can also be held liable for the costs of assessing the environmental damage, as well as the administrative costs of enforcement and oversight, the costs of data collection and monitoring, interest on recoverable costs (if those are incurred by the government) and the legal costs.

Resource equivalency analysis

To determine the type and amount of remediation needed to compensate the public for past, current, and anticipated future losses related to an incident, both the US natural resource damage assessment regulations (NOAA, 1997, 2006) and the ELD (for current and future losses) stipulate the use of *resource equivalency analysis (REA)*. Its fundamental philosophy is trying to equate the size or value of the environmental damage to the size or value of the environmental benefits generated through remediation projects.

The resource equivalency methods of assessing remediation needs include:

- ***Resource-to-resource method:*** This method refers to remediation which tries to match the actual lost resources with new ones. For this method to work, one must discern which organisms are lost to a particular impact and which are gained by a particular remediation. The comparison of gains and losses can also be made on the basis of the amount of habitat lost (e.g., hectares), in which case it is referred to as “habitat equivalency analysis”⁸.
- ***Service-to-service method:*** This method focuses on “natural resource services” – functions performed by a natural resource for the benefit of the ecosystem (such as purification of water or maintenance of biodiversity) or the public (for example, flood control or recreational opportunities such as fishing, hiking, bird watching, and simply enjoyment of a healthy natural environment). Since the amount of services per unit of resource is not necessarily the same across a remediation site, the physical size of the remediation could be more or less than the physical size of damage.
- ***Value-to-value and value-to-cost methods:*** These approaches can be applied to situations that are not well-suited for resource-to-resource or service-to-service equivalency. This can happen if, for example, proposed remediation projects provide different natural resources, habitats or services, or if the resources or services cannot be accurately measured in a particular remediation case. The value-to-cost method involves estimating the ‘value’ of environmental damage and selecting remediation options that have a monetary equivalent to this value.

Conducting an equivalency analysis involves three main steps:

- 1) Quantify the effects of environmental damage in terms of the extent and degree of lost resources or services;
- 2) Identify and evaluate remediation options in terms of quantity and quality of service or resource replacement anticipated to be provided; and
- 3) Adjust the degree and timeline of the remediation to compensate for the lost resources or services over time.

⁸ The habitat equivalency analysis was formalised in environmental regulations issued in 1996 by the US National Oceanic and Atmospheric Administration.

An example of the use of REA for damage to water resources in the US is provided in Box 5. In Europe, REA is used only in a few countries, such as Germany, Sweden and Spain (REMEDE, 2007b).

Box 5. Resource Equivalency Analysis: Trout Remediation, Coeur d'Alene River Basin, Idaho, USA

The Coeur d'Alene River Basin was the site of more than a century of releases of cadmium, lead, zinc, and other heavy metals from mine waste rock and tailings. Aquatic resources there have been degraded by releases of hazardous substances from mining and mineral processing operations.

Damage calculations for aquatic biota habitat (surface water, fish, and other aquatic organisms) were based on the cost of replacing the ecological services that should have been provided by the degraded surface water over time. Remediation actions to replace the habitat for fish provided a means of calculating replacement costs for both surface water and aquatic biota. Remediation alternatives considered included physical habitat enhancements in nearby streams that would enable fish spawning, rearing and survival.

Losses from contamination and gains from habitat enhancement were evaluated using trout population density as the metric. Trout population response to water quality improvement was modelled based on empirical data from a range of water streams of different water quality in order to predict the effect of planned clean-up actions on future population trends in the impacted area.

A range of remediation projects was investigated, and the costs of implementing the alternatives were calculated and equated to the quantity of damage. The calculation accounted both for the loss relative to baseline conditions and for compensatory remediation necessary to replace the habitat services until the attainment of the baseline conditions. Depending on the remediation project and the implementation period assumed, the remediation costs ranged from USD 64.4 million to USD 177.9 million.

Source: REMEDE, 2007a.

The biggest challenge of the resource equivalency methods is the estimation of the degree of loss associated with the environmental harm (and, similarly, of the benefit from remediation). The key to equivalency methods is determining a *unit of measure* of damage that can describe losses over time and can be matched to the benefits of remediation over time. The quantification of damage (or benefit) can be expressed in monetary units, area of required remediation, number 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. Common practice includes using a single attribute of the natural resource or environmental service. Examples of single-attribute metrics include measures of vegetation or organism density, biomass, counts of individuals lost. The metric used should be the same attribute on the loss and gain sides of the equation.

There is no single objective standard for determining which metric should be used. Considerations taken into account in selecting the measurement unit of the damage include the type of damage (e.g. physical or chemical), the scale of the damage (e.g. area, timing, anticipated duration), and, most importantly, the nature of the remediation available for compensation, since the same metric must be used to estimate the scope of the remediation. The selection of an appropriate metric is usually done in close consultation with biologists, ecologists, or other relevant environmental scientists.

The result of a REA can be presented in terms of the amount and type of required remediation or in terms of the cost of implementing the required remediation. The total costs include implementation, administration, operation, maintenance, and monitoring expenditures required to ensure that the project provides the benefits incorporated in the equivalency analysis.

REA is only one input into the process of deciding how remediation should most fairly and feasibly proceed. REA does not account for the value of irreversibly lost and non-recoverable natural resources and services (such as endangered species and habitats). Other considerations may also be taken into account by competent authorities, operators or other stakeholders at a given damage site.

Scope of remediation

The scope of remediation may be mandated in the law or left to the discretion of the competent government authority. According to the EU ELD, contaminated land should be remediated to the point where it no longer poses significant risk to human health. In case of damage to wildlife species, their habitats and water resources, the decision on the extent of remediation measures to be undertaken by the liable operator is up to the competent authority.

There may also be a different remediation standard for new and historic damage. For example, in Flanders (Belgium) newly contaminated areas must be cleaned up in all cases where statutory limits of contamination were exceeded. In case of historic pollution, the decision to perform clean-up operations is based on the assessment of human health and environmental risks resulting from the damage⁹.

To define a remediation project, several alternatives should be developed, each of them consisting of a single action or a combination of actions that could potentially restore, rehabilitate, or replace the equivalent of the damaged natural resources or services. The preferred alternative is then selected based on a set of criteria (e.g. technical feasibility, effectiveness, acceptability to the public and cost efficiency) and described in terms of timing and degree of anticipated gains as well as implementation costs (including capital, operation, maintenance, and monitoring costs).

For example, the ELD (Annex II) establishes the following criteria for the selection of appropriate damage remediation measures:

- Effect of each option on public health and safety;
- Cost of implementing each option;
- Likelihood of success of each option;
- Extent to which each option will prevent future damage and avoid collateral damage as a result of implementing the option;
- Extent to which each option takes account of relevant social, economic and cultural concerns, and other locally specific factors; and
- Length of time it will take for the restoration of the environmental damage to be effective.

The final step in the assessment of remediation needs is *determining the scale of the remediation projects* to implement so that, over time, the discounted value of resources or services resulting from these projects is equal to those lost due to the environmental damage.

⁹ Flanders Land Recovery Decree, 1995.

3.3 Evolution of Environmental Damage Assessment in EECCA

As discussed in Section 2.2, liability systems in EECCA remain focused on assessing the resulting damage for purposes of monetary compensation (essentially serving as a penalty) rather than on correcting the damage, limiting its impacts and preventing further damage. Consequently, competent authorities have traditionally relied on damage calculation methodologies that were largely theoretical in nature.

The Soviet-era “Temporary Methodology on... Assessing Environmental Damage Incurred by the Economy and Caused by Environmental Pollution” (1983) was the first one to address the issue of environmental damage in the conditions of a planned economy. This document was the foundation of the *statutory approach* to environmental damage assessment in EECCA countries. The statutory approach uses fixed cost parameters as surrogates of actual remediation costs to calculate a certain value accepted as damage. Thereby the calculation of damage is extremely simplified and does not involve expensive data collection and economic assessment and justification by independent experts. The official approval of the respective methodologies facilitates their acceptance by courts¹⁰. However, practice demonstrates that they result in significant underestimation of the damage.

Many damage calculation methodologies in EECCA countries make the value of the damage a function of current pollution charge rates. For example, in Kazakhstan the damage from an unauthorised release of a certain pollutant (or type of waste) is stipulated to be directly proportionate to the mass of the pollutant emitted in excess of the permitted limit and the charge rate for that pollutant (multiplied by 10).¹¹ The link to pollution charge rates is most often present in methodologies related to air pollution (e.g. Moldova’s “Instruction for Calculating Damage from Air Pollution from Stationary Sources” of 2004), which is not accidental, since it is next to impossible to estimate a monetary value of damage from an incremental increase in air emissions.

In recent years, most EECCA countries have introduced legislative provisions for *optional* damage assessment based on actual remediation costs. For example, Article 78 of Russia’s Federal Law “On Environmental Protection” (2002) stipulates that the value of environmental harm is calculated based on the actual costs of environmental restoration or, in the absence of a remediation project, according to the tariffs and methodologies established by competent environmental authorities. However, there is no clarity as to which approach should be considered as the primary option. It is illustrative that Federal Laws “On Natural Areas of Preferential Protection” (1995) and “On Fauna” (1995) as well as the Water Code (2006) state the primacy of tariffs and calculation formulas over the actual remediation costs as damage assessment methods.

Kazakhstan’s Environmental Code (2007) defines economic value of environmental damage as the cost of environmental remediation (Art. 108), to be assessed directly or indirectly. The direct method of assessment is to determine the expenditure (in market prices) necessary to restore natural resources and living organisms through “most effective engineering, management and technological measures” in accordance with a time-specific project (Art. 109). The Environmental Code gives “priority” for the remediation to be undertaken by the party responsible for the damage. It also provides for the engagement of independent experts whose fee must be paid by the responsible party. The indirect method (using fixed parameters and formulas) may be used only if a direct assessment cannot be performed (Art. 110).

¹⁰ Many such guidance documents have been developed by competent authorities but have not been registered by the Ministry of Justice and, therefore, are not legally valid. In EECCA countries, court decisions based on “unapproved” methodologies are open to strong legal challenges.

¹¹ It is also inversely proportionate to the environmental quality standard for the given pollutant to account for the pollutant’s toxicity (Erkinbayeva, 2009).

There have been attempts to improve damage calculation methodologies by combining fixed statutory damage values with some real costs. For example, the Moscow City “Methodology for Assessing Environmental Harm from Air Pollution from Stationary Sources” (2005) prescribes a formula that includes actual expenditures for damage evaluation (such as sampling and laboratory tests). A similar Moscow methodology for damage from surface water pollution (2003) even tried to put in one formula the statutory damage value, actual costs of clean-up performed by city authorities, and opportunity costs (based on the current discount rate). However, even these methodologies are closely tied to the degree of non-compliance (exceedance of emission/effluent limit values) rather than the real extent of the harm or remediation needs. In fact, this approach assumes that any damage remediation would be done by competent government authorities and not by the responsible operator himself.

Several environmental damage-related implementing regulations in EECCA also make specific references to remediation costs. The “Instruction for the Calculation of Damage to Fish Stocks in Moldova’s Water Bodies”¹² states that damage to biological resources from water pollution is defined as a sum of expenditures for its remediation, including (i) costs of preventing and compensating quantitative and qualitative losses in fish production; (ii) costs of decontamination of the water body; and (iii) costs of measures to restore the fish populations affected by the pollution release.

However, the same instruction contains a complex formula for calculating the damage which tries to incorporate numerous ichthyologic parameters whose numerical values are listed in the document’s annexes. It is not surprising that in practice competent authorities use the formula and not the remediation costs approach.

Similarly, the Russian 2009 “Methodology for Calculating the Size of Harm to Water Bodies Caused by Violations of Water Legislation”¹³ states in Art. 6 that “damage assessment is based on... the size of expenditure necessary to identify the damage and remove its causes and consequences”. Art. 11 of the same methodology stipulates that the damage must be calculated according to a formula that does not account for remediation costs but includes statutory damage values for different groups of pollutants and various adjustment coefficients.

In summary, even where environmental damage is real and EECCA government authorities have the will to address a particular liability situation, there is little regulatory guidance in the region on how to assess the needs for (scope), and costs of, remediation. While recent regulatory documents declare the principles of damage assessment based on actual remediation costs, there is a complete disconnect between these declarations and the methods used in practice. There are very few, if any, standards for site risk and impact assessment, technique selection, and definition of clean-up levels. In addition, there is limited capacity and expertise in the region to undertake damage assessment: the circle of regional experts remains small while international consultants are too expensive to be relied upon routinely.

¹² Decree of the Ministry of Environment of the Republic of Moldova No. 206 of 07.10.2003.

¹³ Decree of the Ministry of Natural Resources and the Environment of the Russian Federation No. 87 of 13.04.2009.

4. ENVIRONMENTAL LIABILITY AND FINANCIAL SECURITY

The effectiveness of any liability mechanism may be impaired by the potential insolvency of the responsible parties. Financial security requirements for environmental liability serve to ensure that the public does not pay to remediate environmental damage caused by a company or other person that does not have adequate funding to carry out the remedial actions. While their primary purpose is not the protection of the company itself, financial security mechanisms – insurance being the most widely used – may also stimulate the company to reduce the risk of environmental damage.

This chapter analyses the current use and limitations of environmental insurance and a few other financial security mechanisms in OECD countries and the challenges of their introduction in EECCA.

4.1 Development of an Environmental Insurance Market

In many OECD countries, owners and operators of economic activities subject to environmental liability are allowed or even required to buy insurance against potential damage compensation claims. Liability for accidental and gradual environmental contamination can be covered by general liability insurance or by special environmental insurance. At present, pollution risk coverage is usually excluded from general liability policies and it is provided under separate contracts on a site-specific basis.

The environmental insurance market is still very young, particularly in Europe, where only a relatively small number of insurance companies offer financial protection against environmental liability. In 2011, the overall estimated premium environmental insurance income across the EU was between EUR 250 million and 350 million per year, or less than 1% of the general liability market (CRE, 2011). For comparison, the environmental insurance market in the US was worth USD 2 billion already in 2003 (BIO, 2008).

The US market is more mature and is characterised by higher demand for financial security products. The US environmental liability legislation dates back to the 1980s and mandates unlimited retroactive, strict, joint and several liability (see Sections 2.3 and 2.4). It has financial security requirements for a large range of activities susceptible to cause significant environmental damage (e.g. underground storage tanks, hazardous waste disposal sites and dry cleaners). Supported by strict enforcement, the regulations have created high economic risks for potentially liable operators and, therefore, have driven the demand for environmental insurance.

Initially, 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. Over the years, insurance companies have learned to quantify and manage information on potential losses. Site-specific policies have been modified to apply to specific risks (e.g. the underground storage tank insurance) covering third-party claims for bodily injury, property damage, clean-up costs and legal defence costs. There are also “contractors pollution legal liability” policies that cover contractors’ environmental risks. Some insurers are now starting to offer policies that focus on the needs of small and medium-sized enterprises (SMEs), including insurance products that combine pollution with other casualty coverage. However, despite its “early start”, environmental insurance in the US remains a product with limited distribution to a sophisticated clientele of high-risk businesses and real estate developers.

In Europe, there were practically no insurance products for natural resource damage when the ELD was adopted in 2004. Contrary to insurance policies covering traditional damage as a consequence of pollution accidents, stand-alone environmental liability insurance schemes are still at an early stage of development in Europe. So-called environmental impairment liability insurance policies mainly cover traditional liability, but some have recently been expanded to cover claims for environmental damage. A positive example is Germany's system of voluntary insurance based on recommendations developed by the German Insurance Association (GDV), which has by far the highest rate of environmental liability insurance coverage among EU countries (Hellberg, 2011).

4.2 Challenges and Current Practices of Environmental Liability Insurance

Insurance companies always conduct an extremely careful evaluation and classification of the risk to be covered. Detailed historical information and technical data concerning the prospective insured's site and operations are collected, and a comprehensive inspection of the industrial installation is performed on behalf of the insurance company by a team of qualified engineers. The evaluation covers the adequacy of safety measures, protection systems and emergency plans, as well as the geological, hydrological and atmospheric conditions of the surrounding area. Companies that have a poor environmental record are likely to find it difficult to obtain insurance, and even when they can, the terms would include high premiums and restricted coverage.

As soon as the insurance terms are agreed, the insurance company would engage the facility's operator in measures to reduce the risk and to enhance loss prevention strategies. During the entire period of the insurance contract, the insurance company would closely monitor the insured's activity in order to prevent complacent behaviour stemming from the fact that the risk is 'transferred' from the operator to the insurer. Moreover, additional investments in preventive measures may be rewarded by the insurer with a reduction in the annual premium and/or with a broader coverage.

The *ex ante* internalisation of environmental costs through the payment of premiums and investments in pollution risk reduction in cooperation between the industry and the insurance sector constitutes the essence of a flexible mechanism of *private surrogate regulation*. However, the realisation of an environmental insurance regime's potential as an important instrument of environmental compliance assurance requires addressing several key challenges of its design.

Uncertainty constraints

The essential precondition for any risk to be insurable is that the insurer must be able to make a reliable estimate of the potential claim amounts to be paid out over a specific and reasonably long period. Yet, environmental pollution risk and respective liability involve both factual and legal uncertainty.

Insurance is only able to perform its function correctly if certain amount of information on the probability and possible extent of the damage is available. The *factual uncertainty* refers in particular to gradual pollution events (such as leakage of toxic substances) which develop slowly over a long period of time and whose damaging effects may become apparent only after several years, or even decades. It may be difficult to establish the exact moment when the release began, how long it lasted, and when the consequent environmental harm occurred (which should trigger the coverage). As a result, while sudden and accidental pollution coverage is offered by most insurers, gradual pollution is covered by only a few.

Since the triggering events cannot be assigned to a particular point in time, determining the terms of insurance coverage under the traditional formulas becomes quite problematic. For example, due to the current difficulties for insurance companies 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 (at least in one sector), thereby having high-risk companies purchase more than a proportionate share of insurance, and the insurer experiencing losses because of an inaccurate assessment of the risk.

An important barrier to the development of more far-reaching insurance products is the lack of statistical data on the frequency and severity of environmental damage and proven methodologies for *ex ante* risk assessment and *ex post* damage assessment. As mentioned in Section 3.1, monetary valuation techniques result in damage values that are highly subjective, and the number of cases of cost assessment of remediation measures is limited, especially in Europe. As of January 2010, only 16 environmental liability cases had been treated under the ELD provisions across the EU, mostly with respect to damage to water or land (EC, 2010). Whereas the insurance industry has some, albeit limited, experience with primary and complementary remediation, there is no such experience for compensatory remediation.

Presently, insurance coverage tends to exclude compensatory remediation (except in a few countries, such as Germany and Austria), and complementary remediation may be covered to a very limited extent. Damage to land and/or water is usually covered to some extent, while a very limited number of insurance products for biodiversity damage are currently available in the European market. This situation of limited and often overpriced coverage is likely to continue as long as the scope and economic consequences of environmental liability, be it civil or administrative, are viewed by the insurance industry as highly unpredictable *ex ante*.

In order to encourage and stimulate the development and growth of the pollution insurance market, the environmental liability regime should be designed and formulated in the legislation in a way that provides a sufficient level of clarity and predictability of the related financial risks. The *legal uncertainty* may be caused by the following features of the environmental liability regime:

- Retroactive liability regimes are incompatible both with the basic idea that environmental liabilities should be aimed at providing incentives to potential polluters and with the very nature of the insurance mechanism. This is why even in the US, with its system of retroactive liability, historic pollution risks are not insurable.
- With respect to the criteria for allocating liabilities among multiple polluters, a proportional liability system creates less uncertainty for insurers than the joint and several liability standard. While it is complicated to assess the contribution of individual polluters responsible for the damage *ex post* (under a proportional liability system), it is even more difficult to do it *ex ante*. In a joint liability system, the insurer would have to estimate not only the risk created by the prospective insured, but also the risks generated by all the other actors whose conduct may eventually combine with the one of the insured in causing a polluting event (see Section 2.4).
- Finally, the fault-based standard rather than strict liability could be interpreted by the insurance industry as incompatible with the transfer of liability to the insurer. This is why existing environmental insurance policies *function only in strict liability regimes* and commonly do not cover damage as a result of intentional acts, and the insurer usually has the right to reduce the compensation for damage arising from gross negligence.

Mandatory or voluntary insurance

Industrial operators, especially SMEs which tend to underestimate their environmental risks, may be reluctant to buy environmental insurance. In general, most operators are not proactive in managing their environmental liabilities and leave themselves exposed to environmental risks (BIO, 2008).

There are several reasons for this. The prospective insured has to bear considerable costs of site inspections and technical analyses by the insurance company. Moreover, many businesses are very sensitive about providing insurance companies with access to their sites: in many countries, regulations require immediate notification of competent authorities should a site inspection reveal any regulatory violations on the operator's premises. In addition, it is quite common that after an industrial facility has passed the insurability inspection performed by an insurance company's engineers, the owner refuses to purchase coverage because he or she feels that the industrial activity in question is safe enough (OECD, 2003). However, the fact that a facility is insurable only indicates that the risk posed by that particular installation is predictable enough to be insured but not that an accident will never occur.

A system of mandatory pollution insurance – at least for those activities that are particularly dangerous for the environment – may seem to be an appropriate solution to address industry's reluctance to buy insurance against environmental risks.

Following the US example (Section 4.1), five EU Member States (Bulgaria, the Czech Republic, Portugal, Slovakia and Spain) have introduced mandatory financial security for potentially hazardous industrial activities¹⁴, and four others intend to do so. Lower-risk activities may be exempted from the financial security requirement on the basis of certain criteria: for example, Spain and the Czech Republic provide exemptions for operators with a certified environmental management system (EC, 2010).

It is important to note that the mandatory environmental insurance schemes established in OECD countries do not impose an obligation for insurance companies to insure individual operators. This is called *unilateral* mandatory insurance: the company has an obligation to buy coverage in order to be allowed to operate, but insurers may refuse to cover anyone at their own discretion. As discussed above, environmental policies are tailor-made and site-specific, and not every facility has all the characteristics that make it insurable¹⁵.

As part of mandatory financial security, the law may require a *minimum level of financial guarantees*. This means that the operator must have one or more financial security instruments that together provide at least the minimum level of indemnity. The minimum financial guarantee may depend, among others, on the type of activity, location and size of the installation or specific risks. For example, in Spain it is determined by the competent environmental authority according to criteria specified in the regulations (but the mandatory financial guarantee cannot exceed EUR 20 million). Operators unlikely to cause damage exceeding EUR 300,000 (or EUR 2 million for operators with a certified environmental management system) are exempt from the financial guarantee requirement.

Most European countries have decided to rely on voluntary financial security. For instance, France and Germany considered that compulsory insurance would not make sense in an emerging insurance market, where the limited number of insurers could result in high premiums. In a quasi-monopolistic market, insurance companies would also have fewer incentives to align the premiums to the individual behaviour of insured operators. Moreover, mandatory insurance may reduce the incentive for operators-policy holders to invest in damage prevention. Most insurance companies in Europe were not enthusiastic about the introduction of compulsory financial security schemes either, due to the lack of experience in estimating potential damage and the possibility of costly claims (BIO, 2008).

¹⁴ Mandatory financial security is not necessarily restricted to insurance products, as discussed in Section 4.4.

¹⁵ In a unilateral mandatory insurance scheme, the insurer effectively has the power to decide which operators can continue their activity and which are forced off the market as uninsurable. Such substitution for the regulatory authority may lead to different kinds of abuse.

In voluntary financial security systems, insurers and operators negotiate limits for the kinds and size of the damage they would cover. Setting a *maximum insured amount* should be based on an economic assessment reflecting the risk involved and the financial capacity of the insurance companies. If the amount is too high, it would lead to excessive insurance costs for enterprises. If it is too low, the insured enterprises would have to cover the remainder of the damage or, if they are unable to do so, the government would have to pay.

A strict environmental liability regime without any requirement of financial security of industrial firms may lead to an increase in litigation and transaction costs. However, it is ultimately the enforcement of liability by administrative and judicial means, not a regulatory mandate, that drives the demand for environmental liability insurance.

4.3 Lessons Learned from Early Environmental Insurance Schemes in EECCA

Historically, the lack of a viable financial guarantee system in EECCA resulted in a situation where all significant environmental remediation projects in the region were almost fully financed using budgetary resources. To address this problem, several EECCA countries started to develop an environmental insurance system in the late 1990s. It was introduced to cover civil liability of owners of potentially environmentally hazardous facilities with respect to traditional (health and property) and environmental damage caused by industrial accidents.

Russia's Federal Law No. 116-FZ (1997) "On the Safety of Hazardous Industrial Facilities" (Art. 15) mandated environmental insurance for "hazardous industrial facilities" (defined as those generating, using, treating, storing, transporting, or disposing of hazardous substances or wastes) and set different minimum levels of insurance coverage for facilities handling more and less than the specified threshold amount of hazardous substances.¹⁶ Article 107 of the Environmental Code of Kazakhstan (2007) envisages both mandatory environmental insurance of hazardous activities and voluntary insurance to be governed by agreements between individual enterprises and insurance companies. However, Kazakhstan's law on mandatory environmental insurance covers only damage from accidental pollution to human health and property and not damage to the environment (as the state is not regarded as a potential victim).

In EECCA, an insurable event in the domain of environmental insurance is commonly defined as "sudden, unintentional infliction of damage as a result of an accident or a natural disaster" (Golichenkov, 2001). This means that environmental insurance does not cover damage from gradual pollution. Only insurance companies approved by the Ministry of Finance are eligible to insure environmental risks.

Despite the adoption of regional environmental insurance laws and regulations in many Subjects of the Russian Federation, the practical experience of the implementation of mandatory insurance in Russia has shown very few cases of environmental insurance claims (GTZ, 2007). The core reason for the dysfunction in the environmental insurance systems in EECCA is the *weakness of the liability provisions which results in the lack of substantial damage compensation claims* (see Section 3.3).

¹⁶ With the adoption of Federal Law No. 225-FZ (2010) "On mandatory insurance of civil liability of owners of hazardous facilities for damage caused by accidents at such facilities" (in force as of 01.01.2012), the liability for damage to the environment was deleted from this article (neither is it mentioned in the new law). Thus, mandatory environmental insurance in the Russian Federation has been reduced to insurance of traditional liability (for damage to health, property, etc.).

If courts upheld damage suits, hazardous facilities would have an incentive to buy reliable insurance to protect them against their exposure to liability. In the absence of such suits, insurance companies in EECCA generally do not anticipate that they will be liable for any environmental damage and view the arbitrarily set premiums as pure income. Moreover, in the early years of the mandatory insurance schemes, there were cases of kickbacks to environmental authorities for promoting one or another insurance company among the regulated community. For example, several insurance companies signed agreements with the Russian Ministry of Natural Resources by which the ministry endorses them to offer environmental insurance. In exchange, the insurance companies paid a certain percentage (up to 15%) of the premium revenues to the government for environmental protection measures (OECD, 2002b).

The lack of independent assessment of an operator's environmental risks also impedes the development of an environmental insurance market. In a functioning environmental liability system, the vast majority of insurance companies in EECCA countries would be unable to compensate potential damage. One reason for this is the inadequate assessment of insurance companies' assets and financial strength prior to issuing them a licence to offer environmental insurance. The other is artificially low insurance premiums which result from the lack of real risk assessment and the desire to attract "paying customers". The 2007 "Temporary Regulations on Independent Assessment of... Man-caused Emergencies and Natural Disasters" approved by Russia's Ministry of Emergency Management are the first attempt in the EECCA region to establish a system of independent environmental risk assessment.

Indeed, several EECCA countries currently have *bilateral mandatory insurance* schemes, where the company has an obligation to buy coverage in order to be allowed to operate and the insurance industry has an obligation to provide coverage at pre-determined conditions, approved by the competent authority, to each and every applicant. Bilateral mandatory pollution insurance, however, is incompatible with the very nature of risk-based environmental insurance. Moreover, standard conditions applicable to every insured operator would make pollution insurance similar to general liability insurance schemes, which, as described in Section 4.2, are poorly suited to the level of uncertainty inherent in environmental liability. In addition, a bilateral mandatory insurance scheme may have a negative influence on the motivation of operators to manage their risks.

4.4 Alternatives to Environmental Liability Insurance

Insurance is not the only way to provide adequate financial guarantee with respect to the environmental pollution risk. Indeed, the introduction of an obligation to provide financial security in any form acceptable for the competent authority (as it is done, for example, in Spain and the Czech Republic) may be a better way to overcome the insolvency problems potentially undermining an environmental liability regime than establishing a mandatory environmental insurance regime. There are several other financial instruments that could be employed, including bank guarantees, "self-insurance" guarantees and collective security arrangements.

A *bank guarantee* is required from certain categories of regulated installations in France (high-risk facilities subject to permits with siting restrictions, waste management installations, and quarries) to cover routine operations, potential accidents, as well as decommissioning and site remediation. A required amount is fixed in a permit based on the operator's estimate (in accordance with the ministerial instructions for its calculation) submitted as part of a permit application and is re-evaluated periodically. In the Netherlands, competent authorities may require operators of waste management facilities to provide bank guarantees as part of the licensing procedure. At the same time, there is evidence that many companies are not in favour of this financial instrument: they argue that bank guarantees severely limit their investment capacity, and that most banks are not keen to cover long-term risks (BIO, 2008).

Some operators practise “*self-insurance*” by retaining the risk and setting aside (e.g. depositing on a special account) funds to meet expected losses. Another self-insurance tool is a corporate guarantee, which enables a business with a large parent or other affiliated company to provide evidence of its financial strength. Self-insurance may not be suitable for SMEs which generally do not have enough financial margin to allocate contingency funds. There is some experience with self-insurance in EECCA: in Kyrgyzstan, each mining company, as a condition of its licence, must create a trust fund for post-closure land rehabilitation.¹⁷

Operators (usually, but not exclusively, small ones) sometimes make *collective arrangements* to meet financial security requirements. In the Netherlands, owners of petrol stations can protect themselves from liability for soil pollution clean-up by participating in the Collective Financial Security Fund. The Fund has been created by the sector itself but only pays in case of bankruptcy of the owner of a petrol station (BIO, 2008). There is also similar experience in the US with so-called “risk retention groups”, in which entities in the same industry sector join resources to provide members with liability insurance. However, such funds do not encourage operators to take measures to reduce environmental risks beyond what is legally required.

None of the listed alternative financial security instruments exists in EECCA countries. The main impediments to their introduction in the region are the lack of methodology to estimate the appropriate case-specific guarantee amount and the absence of a system for competent authorities to control the reliability of guarantees.

¹⁷ In Armenia, mining companies pay into a state-run land rehabilitation fund, whose resources are used by the government to conduct remediation measures in case private operators fail to do so.

5. CONCLUSIONS AND RECOMMENDATIONS FOR EECCA DECISION-MAKERS

The conducted comparative analysis of the environmental liability systems shows that several EECCA countries have started to implement some elements of international good practices (for example, Russia and Kazakhstan are moving toward damage assessment based on actual remediation costs). However, much remains to be done to make environmental liability an effective tool for the prevention and remediation of environmental damage.

One major avenue for reform is to *re-orient EECCA environmental liability systems toward the restoration of the environment*. Contrary to the EECCA region, environmental liability in OECD countries is not a penal regime designed to punish the party responsible for the damage (or simply non-compliance) but a system that is focused on remediating the damage done. Consequently, compensation of environmental damage is understood not as a monetary penalty payable by the responsible party to the government but either as remediation measures undertaken by the responsible party or as the reimbursement by the responsible party of clean-up costs borne by the government.

As a first step in this direction, EECCA countries should introduce the following basic principles into their legal systems (using the recent draft Russian law on environmental damage as a positive example):

- The primary objective of the liability regime is damage remediation (or conducting equivalent environmental measures) by the responsible party based on specific requirements and under supervision of competent environmental authorities; and
- If the responsible party is impossible to identify or is insolvent, it is the duty of the government to restore the environment.

It is important that EECCA countries *introduce strict liability for environmental damage*, at least with respect to well-defined categories of hazardous industrial activities. The strict liability standard, most frequently applied in OECD countries, is more appropriate for hazardous activities than a fault-based regime because it forces industrial operators to consider both the level of care and the nature and level of activity, creating incentives for good corporate environmental management.

The assessment of environmental damage in EECCA countries should be predominantly based on the *estimate of the needs and costs of restoring the affected natural resources or environmental services*. This recommendation stems directly from the pre-eminence of the goal of environmental remediation. Clean-up requirements can be determined by competent authorities with a high degree of clarity and predictability. EECCA countries should develop regulatory procedures for the scoping of remediation measures and strict control over their implementation. The statutory (formula-based) approach to damage assessment and monetary compensation should be used only if it is impossible to undertake remedial actions, as proposed in Russia's draft legislation. The administrative and judicial powers for ordering and enforcing environmental damage remediation should also be clarified.

Effective financial security mechanisms (such as insurance) are crucial in protecting the public from having to pay to remediate environmental damage caused by a responsible party that does not have adequate funds to do it. An environmental insurance scheme may be voluntary or mandatory for operators of high-risk activities, as long as coverage is provided after an extremely careful evaluation and classification of the risk by insurance companies on a site-specific basis. As a general rule, environmental insurance functions only in a strict liability regime (legal non-compliance is not insurable) in the presence of realistic damage assessment methodologies. Environmental insurance may eventually be combined with other financial security instruments, such as bank guarantees or asset deposits, which require strict government oversight.

The success of any financial security scheme would primarily depend upon a well-functioning, strictly enforced liability regime. Only in an effective liability system will any operator undertaking risk-related activities have a sufficient incentive to protect his or her operations through insurance. Therefore, EECCA countries should ***implement and enforce the improved environmental liability regime before introducing related financial security requirements.***

Enhanced international cooperation between policy makers and experts in OECD and EECCA countries would be beneficial in implementing these reforms. This dialogue may be conducted through a variety of mechanisms, from twinning country-level projects to ad hoc meetings between liability (government and other stakeholder) experts from EECCA and the EU.

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LIABILITY FOR ENVIRONMENTAL DAMAGE IN EASTERN EUROPE, CAUCASUS AND CENTRAL ASIA (EECCA): Implementation of good international practices

The economic implications of weak environmental liability regimes are multiple and substantial, including the need for public financing of environmental remediation activities, increased spending on public health, loss of competitiveness because of work force migration out of polluted areas, loss of ecosystem functions, etc. This report aims to assist countries of Eastern Europe, Caucasus and Central Asia (EECCA) to streamline their systems of environmental liability, thereby implementing more amply and effectively the Polluter Pays Principle. More specifically, the report compares the concepts and existing practices in OECD and EECCA countries and provides recommendations on reforming liability provisions for environmental damage in the EECCA region. The project was financially supported by the Governments of Finland and Switzerland.

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