

ENVIRONMENTAL LIABILITY IN THE EU – APPLICATION OF THE POLLUTER-PAYS PRINCIPLE?

by

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Introduction

Environmental damage caused directly by economic operators when carrying out their business is an on-going concern in developed economies.

In the US, federal legislation and regulation has been in place for several decades², with a well established implementation practice of assessing such damage and holding the polluter liable for it.

Within the EU, there was until recently no Community wide legal system, although Member States applied national legislation at varying degrees of coverage. However, after more than a decade of preparatory work, such a Community liability scheme to prevent and repair environmental damages caused directly by economic operators was indeed introduced in 2004, with the adoption of the Environmental Liability Directive³.

The aim of the article is to analyse the rationale of the scheme, against the background of established economic theory⁴. The basic economic argument is that an economic agent, who causes the release of hazardous substances into the environment, should pay for the resulting damage. The argument is also called “The polluter-pays principle”⁵. The main reason for the application of this principle is that the economic agent, by being held liable for the social costs of his actions, and therefore “internalising those costs”, is induced to carry out “optimal” prevention measures.

The next section explains the principal difference between this economic perspective on damage prevention and the environmentalist/legal perspective on damage prevention and remediation applied in the newly adopted EU Directive. The following two sections compare more in detail the economic method of identifying social costs of environmental damage with the corresponding method of identifying remediation actions and costs in the Community scheme.

The final section concludes that the Community scheme, although differing in important respects from the economic approach, appears appropriate particularly if there are considerable non-use values affected by the environmental damage concerned. This is so,

¹ The views in this presentation are those of the author and do not necessarily reflect those of the EU Commission. The author wishes to thank Pierre Deusy, Charles Pirotte and Stephen White for valuable comments on an earlier draft.

² The main legal acts are Comprehensive Environmental Response, Compensation and Liability Act (CERCLA; “Superfund”); Oil Pollution Act (OPA); and National Marine Sanctuaries Act (NMSA). The main regulations are the Natural Resource Damage Assessment Regulations (NRDA) under CERCLA and OPA. For a brief overview, see Penn [2001].

³ EU [2004].

⁴ As, for instance, described in Kaplow & Shavell [2000].

⁵ Pigou [1936].

since the scheme circumvents the difficult, if not impossible, task of determining social costs in the form of non-use values foregone by using an alternative evaluation technique, based on the “compensation-in-kind principle”.

Perspectives on the polluter-pays principle

The polluter-pays principle is well established in EU environmental policy. Early on, it was embodied in the Community Environmental Action Programmes and it was eventually incorporated, in 1987, as a guiding principle in the EC Treaty.⁶

That notwithstanding, the meaning of the principle, as applied in EU legislation and policy in the context of environmental damage, is not clear. One can find basically two different interpretations, which, in the context of this article, are called the economic interpretation and the environmental/legal interpretation.

In the **economic interpretation**, the rationale of the principle lies mainly in its *prevention* of socially undesired environmental damage. As already explained by Pigou⁷, having to carry the full social costs of environmental damage leads an operator to internalisation of those external costs. This in turn induces the operator to adapt his activities: emissions into environment are diminished, and risks of damage to the environment reduced, to socially acceptable levels.

In the **environmental/legal interpretation**, the rationale of the principle lies rather in establishing operators’ liability *to finance remediation* of environmental damage caused by them. Damage to the environment due to emissions from normal operator activities or from accidents should be undone, and the financial burden of this undoing should be put on the operator causing the damage. It is deemed essential that other parties, in particular the public budget, should not be called upon to pay the bill.⁸

It is clear that the two interpretations are inter-linked to a certain degree. For instance, even with socially “optimal” prevention of accidents, accidents do happen now and then and the resulting damage does have to be addressed. In the economic interpretation, the costs for this enter the equation indirectly, with the operator being made aware that he will have to cover the full social cost of the damage if and when it occurs. However, that cost is not inextricably linked to remediation. If affected parties would be satisfied with monetary compensation amounting to less than the cost of full remediation, than the former would constitute the social cost of the damage and remediation not be done to the full.

On the other hand, even if the liable operator is called upon to pay the bill for remediation, as foreseen in the environmental/legal interpretation, this does not mean that the full burden of financing the remediation would fall upon him. The costs incurred will,

⁶ Article 174.2 of the EC Treaty stipulates that “Community policy in the environment ... shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and **that the polluter should pay**”.

⁷ See footnote 5.

⁸ In this article we do not deal with liability concepts used in tort law, since the Directive consists of a public law approach, despite its title.

to a certain degree, be priced into the output sold by the operator, leaving it to his customers, and ultimately society, to pay part of the bill.

As we already can infer from the above, the two interpretations also differ in their view of what constitutes environmental damage. In the economic interpretation, environment is valued by the services it provides to the general public. If none of the latter shows concerns about a certain quality change in those services, induced by the environmental damage, then there is no social cost associated with that change. One might even say that there is, by definition, no damage in that respect. On the other hand, the environmental/legal interpretation considers the environment to be its own subject. Environmental quality is defined in a more general way (where services to the public form only part of the picture) and all adverse changes in that quality are deemed to be a damage. For instance, if an emission would extinguish a minor species (say, an insect) in a remote area, with the general public being completely unconcerned, this would still constitute a damage to the environment, to be addressed by remediation.

It is important to keep these two different interpretations of the polluter-pays principle in mind when studying its application in the EU Directive.

Social costs of environmental damages

According to the economic approach, social costs caused by environmental damages are being identified on the basis of whether and to which extent the damages affect the general public, or “society at large”. The valuation of these effects is through individuals’ “request” for monetary compensation to accept the damage. The latter is in practical terms estimated, as far as possible, by using existing market prices for services to the public provided by the damaged environment.

For instance, if water pollution renders a beach unusable for swimming, this damage could be valued in a straightforward way if there was an entrance fee to the beach. If not, other costs for access to the beach (such as transport costs) could be used to make an indirect valuation. Prices of property located in the vicinity of the beach (compared to property in other locations) could also be used to assist in valuation.

However, a damaged environmental site is not always directly used by the public. But oftentimes, individuals value the environment, for instance a protected nature area, also for other reasons. Those could be the option to use the area sometime in the future, the wish to preserve the area for future generations, or satisfaction gained from the mere knowledge that the area is maintained unspoiled. Several estimation techniques have been developed and put to use⁹ to measure such **non-use values**, although it may still prove difficult, if not impossible, to express them fully in monetary terms.

The Directive does not address all types of environmental damage caused by economic operators. For instance, on-going pollution caused by “normal” business activities, in line with permits granted by the authorities within the framework of environmental

⁹ For a survey of such methods, see Bateman [2002], a manual prepared for the UK Department of Transport. See also EU [2000], a consulting study prepared for the EU Commission.

regulations, may be exempted from damage remediation by Member States. This leaves us mainly with damages stemming from accidents, and from accumulated¹⁰ damage due to on-going business operations without the framework of environmental regulations. When assessing the social costs of such substantive damages, a straightforward application of the identification and valuation techniques, as described above, is not sufficient. One has also to take into account the inter-dependence between cost identification and the way the damage is being, or could be, addressed. *Figure 1* shows this in more detail.

When an accident occurs, social costs due to damage to the environment start to accumulate. This is shown as the flow of costs following the line “Damage” in *figure 1*. If nothing is done to address the damage, the environment may still recuperate in the long run. In such a case, the flow of costs follows the line “Natural recovery”. Assuming that the environment will recover after a certain number of years, the flow of costs eventually returns to zero. If an option of doing nothing about the damage is chosen, the accumulated social costs over the years arising from the environmental damage consist of the sum of areas **A** and **B** in *figure 1*¹¹.

However, more often than not, it would be gainful for society to speed up the recovery process, albeit this would give rise to new social costs from remediation activities. Those costs are indicated by the area within rectangle **C**. Remediation activities have the effect of moving the social cost curve to the left and should be increased up to the point where the incremental decrease in social damage costs equals the incremental increase in social remediation costs. This situation is indicated in the figure with the line “active remediation”. At this “optimal” option for remediation, the sum of areas **A** and **C** is minimised and **C** does not exceed **B**. The total social cost of the environmental damage with the “optimal” remediation option consists, of course, of the sum of **A** and **C**.¹²

The discussion so far has been limited to the case where the damaged environment is fully restored, with or without active remediation. In some instances, full restoration will prove impossible or economically undesirable. In particular, the costs for full remediation may prove higher than the corresponding decreases in damage costs. However, even if the environment were not fully restored, the amount to be recovered from the liable operator would be sufficient to compensate all those adversely affected by the lingering damage.

In conclusion, two aspects of establishing the social costs of environmental damage deserve to be highlighted. Firstly, a substantive part of those costs usually consists of so called non-use values. Secondly, the size of the costs is depending on the scale of remediation. The presumption in that context is that an “optimal” option (combination of natural recovery and active remediation) will form the basis for deriving those costs.¹³

¹⁰ Damage due to pollution from on-going activities without the frame of permitted activities tend to be discovered first after a certain time-lag.

¹¹ In a fully fledged analysis the corresponding areas would represent discounted values.

¹² This does not rule out the possibility of a corner solution. If remediation activities prove too costly, compared to the corresponding decrease in damage costs, remediation should not be carried out at all.

¹³ This does not necessarily mean that the “optimal” option need be implemented. For the proper internalisation of the social costs it would suffice for the economic operators to realize that they would have to pay an amount corresponding to the social cost at the “optimal” option.

Figure 1 *Social costs of environmental damage*

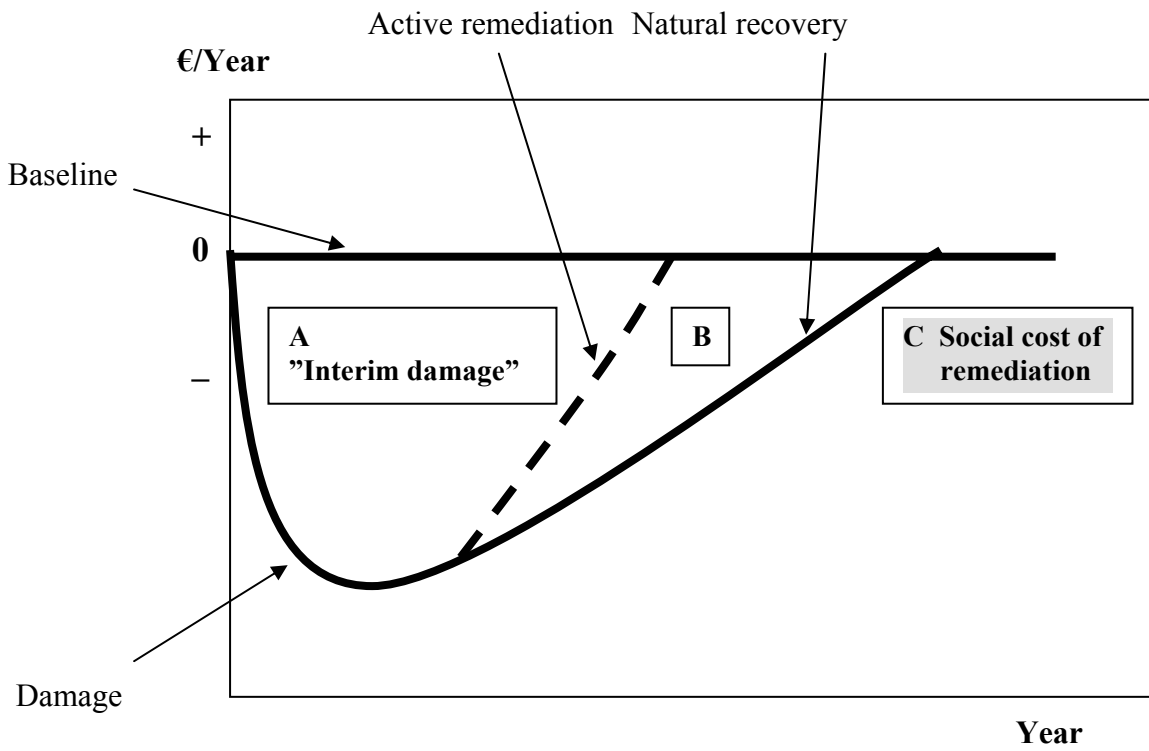
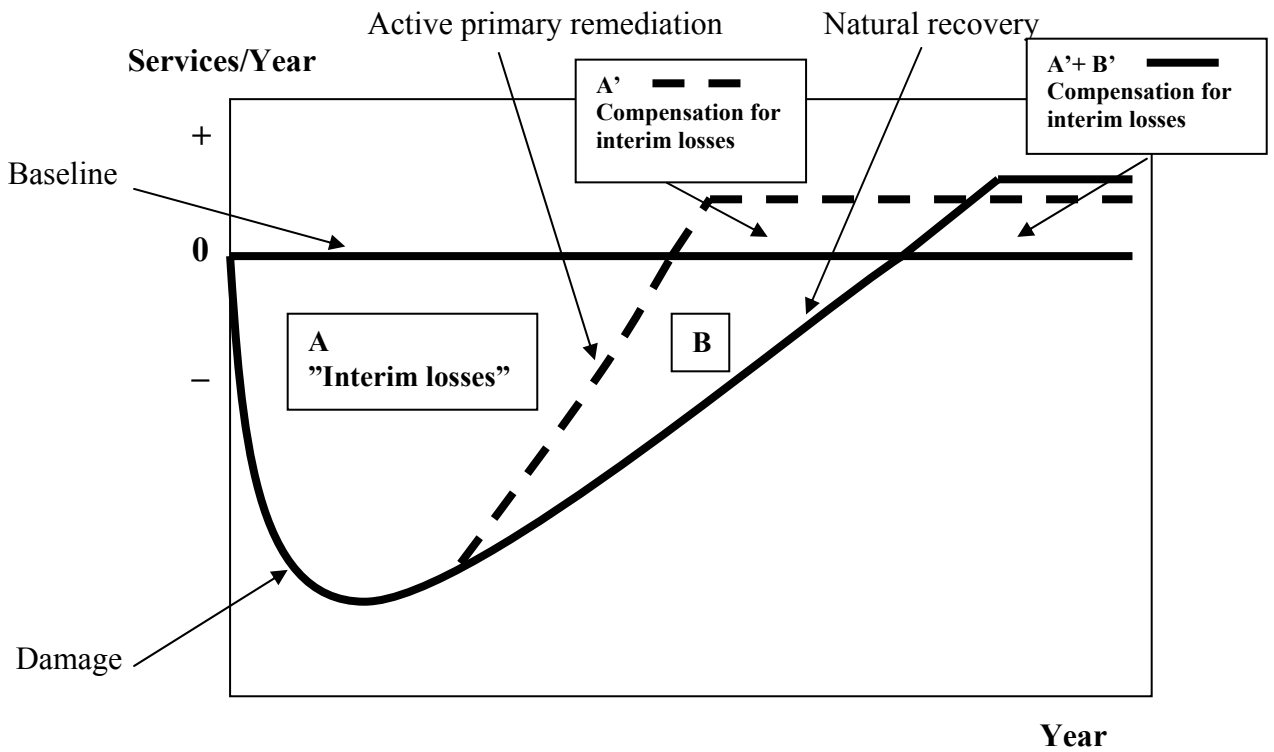


Figure 2 *Remediation of environmental damage*



Remediation of environmental damage according to the Directive

The Directive aims at “restoration of the environment to its baseline condition”.¹⁴ With this focus on remediation it is clear that the proposal applies an environmental/legal interpretation of the polluter pays principle. It is of interest to study, whether the remediation activities to be carried out when a damage occurs, and the corresponding costs to be covered by the operator causing the damage, would be broadly similar to those resulting from applying the polluter pays principle in the economic sense.

More in detail, *box 1* shows the three types of remediation actions, provided for in the Directive, the costs of which the liable operator as a rule has to cover:

*Box 1 Types of remediation actions*¹⁵

1. *Primary restorative action.*
These are remediation actions that aim at directly restoring the damaged natural (environmental) resources and/or services¹⁶ to, or towards, baseline condition. Natural recovery without human intervention is a possible such action (in fact a non-action).
2. *Complementary actions*
These are actions that improve environmental resources and/or services others than those directly damaged. These actions would be taken, either on the damaged site or elsewhere, if direct restoration proved to be impossible or unfeasible.
3. *Compensatory actions*
These are actions to compensate for residual interim losses, that is, damages to natural resources and/or services that accumulate until primary actions and complementary actions have achieved their full effect, as well as any eventual residual damages that keep accumulating thereafter.

Figure 2 explains the logic of the approach more in detail. The horizontal axis no longer indicates monetary values. Instead, it shows a proxy for the environmental resource services affected, by the damage as well as by the damage remediation.¹⁷ For ease of presentation, we do not consider complementary actions in this example.

¹⁴ EU [2004], Annex II. The further discussion of the Directive in this paper refers to that Annex, unless otherwise indicated.

¹⁵ To be more precise, the Directive distinguishes between 3 types of environmental damage: damage to water; damage to protective species or natural habitats; and land damage. The full set of remediation actions, listed in *box 1*, applies only to the two first mentioned. For land damage, a less restrictive regime is applied.

¹⁶ “Services” denotes the functions performed by a natural resource for the benefit of another natural resource and/or the public. For instance, a lake (the water in the lake), together with the soil underneath the water, provides nourishment for the fish living in the lake and thereby, indirectly the possibility of fishing by people visiting the lake.

¹⁷ For instance, if one square kilometer of a certain type of wetlands had been damaged, the vertical axis would simply measure “area” and the area damaged would stand as the proxy for the yearly environmental services lost by the wetland in question. If the damage remained unchanged over, say, three years, the interim loss would then, disregarding discounting, be expressed as three square-kilometer-years. This type

When the accident occurs, damages to the environment start to accumulate. The corresponding yearly loss in resource services follows the line called “Damage”. Without active remediation, the damaged resource services may recuperate on their own in the long run. If so, the yearly loss eventually diminishes to zero, following the line “Natural recovery”. The accumulated loss in resource services, called “Interim losses”, amounts to the sum of areas **A** and **B**¹⁸. So far, the analysis is rather similar to that in the preceding section, apart from the fact, that **A+B** is not expressed in value terms. This is in line with the particular interpretation of the polluter pays principle inherent in the Directive, which, as will be explained below, in fact amounts to the polluter providing “compensation in kind” rather than covering the social cost of the damage.

Even if the authorities accepted the option of natural recovery without active primary remediation, the liable operator would not be able to walk away from the damage without paying. In line with the principle of compensation in kind, he would have to carry out (finance the carrying out of) remediation actions to compensate for the interim losses. These could concern other resources/services on the damaged site or even on another site, as deemed appropriate by the authorities.¹⁹ This compensation is illustrated by the area **A'+B'** in *figure 2*.

The authorities, or even the operator, would, more often than not, find it preferable that active primary restoration actions be carried out. Such a case is indicated by the line “Active primary remediation”. Again, active remediation has the effect of shifting the damage curve to the left, thereby reducing the interim losses and at the same time reducing the compensation for interim losses.

The operator’s choice

Figure 2 does not show the costs for the active restoration actions, which have to be covered by the liable operator. Seen from the operator’s perspective, active remediation should be increased up to the point where the incremental decrease in his costs for providing compensation for interim losses equals the incremental increase in his costs for active primary remediation.

The last-named reminds us, on the surface, of the search criteria for the “optimal” remediation option described in the preceding section. The social cost of interim damage

of measuring through proxy is similar to the measuring, in companies, of the amount of work of a certain quality spent on a project. For that purpose, the measure “man-years” is often used.

¹⁸ Again, in a fully fledged analysis the corresponding areas would represent discounted values. In fact, the Directive provides for the competent the authorities to ensure that compensatory actions “.. reflect time preferences and the time profile of the remedial measures ..”. Since the main remediation approach does not use any monetary values, we have to conclude that discounting of losses in *real resources/services* is to be done. This is intriguing, since it implies, in essence, that at least part of the economic valuation of consequences is preserved in the method.

¹⁹ Assume a discount rate of 3%. Assume further that one square kilometer of wetland is damaged so that it does not provide any services during three years (totally inactive during three years), but would again be fully recovered at the beginning of year 4. In such a case the accumulated interim loss would, at the beginning of year 4, amount to about 3.3 square-kilometer-years. An appropriate compensation would be to put in place an additional 0.1 square kilometers of wetland of the same type, in addition to the 1 square kilometer having been restored to its former status at the beginning of year 4.

(A in *figure 1*) has its counterpart in the operator's costs for the compensation for interim losses (A' in *figure 2*). Either of those has to be weighed against the cost for remediation. The latter is the social cost in the economic approach, but a private (operator's) cost in the framework of the Directive.

For a more detailed comparison with the economic approach, to be done in the next section, it is necessary to study how these private costs are being determined and by which rules the competent authorities choose the most appropriate remediation option.

The derivation of the costs involved

Deriving the costs for carrying out primary restorative actions should be a rather straightforward exercise, and the liable operator's costs for those actions should tend to equal social costs²⁰. Thus our main interest lies in deriving the costs for compensatory actions. These depend in turn on the rules, stipulated by the Directive, on how compensation (in kind) for the interim losses should be determined. The rules to that effect are summarised in *box 2*.

Box 2 Rules for designing compensatory actions

1. Provide, whenever possible, natural resources/services of the **same type and quality**, properly scaled to provide equivalence with the damaged resources/services.
2. If this is not practicable provide, whenever possible, natural resources/services of **similar type or quality**.²¹
3. If this is not practicable other techniques, such as, **monetary valuation** may be used to determine type and scale of compensatory actions.
4. If monetary valuation of compensatory actions is not practicable, compensatory actions may be chosen whose **cost is equivalent** to the estimated monetary value of the damage.

From this summary it is clear that, for a given choice of primary restoration action, there is no one-to-one relationship between the social cost for interim damage (area A in *figure 1*) and the costs connected with compensation for interim losses (A' in *figure 2*). This is so since the method of compensation in kind attempts to replace damaged resources/services with equivalent resources/services, thus striving for equivalence in effect rather than equivalence in costs. Applying monetary (social) valuation (step 3 in *box 2*) does not change this. Its purpose is still to provide equivalent effect, even if equivalence in this case is expressed in monetary terms. First in the last instance, when achieving equivalent effect proves impracticable (step 4 in *box 2*), do the design criteria

²⁰ Resources spent on active restoration are typically market priced. Market prices for resources form the basis for deriving social costs as well as private costs.

²¹ This criterion is implicit in the text.

permit to establish equivalence in costs. Thus, the economic approach is only acceptable if everything else fails!

We said earlier that it was in the liable operator's interest to consider active primary restoration. He would gain by intensifying such restoration as long as the corresponding decrease in his cost for compensatory actions outweighed the cost for more intensive restoration. Therefore the operator would, if left to his own devices, implement the remediation option containing the (for him) least costly combination of active restorative and compensatory actions. However, such an outcome is not inevitable. Even if the Directive²² provides for the liable operator to identify potential remediation options, he has to submit them to the competent authorities for ultimate decision. The latter may of course carry out additional identification activities prior to taking their decision.

The authorities' choice rules

The authorities shall, as basis for their ultimate choice, evaluate the identified options with the criteria indicated in *box 3*. With all in all 9 criteria to assess possible options with, any attempt to derive an explicit preference function for options would be doomed to failure from the outset. However, one can attempt to arrive at some tentative general conclusions about choice patterns, when analysing the choice criteria in the context of the specific decision situation the authorities and the liable operator are being confronted with.

Box 3 Criteria for ranking remediation options

1. The effect of each option on public health and safety;
2. The cost to implementing the option;
3. The likelihood of success of each option;
4. The extent to which each option will prevent future damage, and avoid collateral damage as a result of implementing the option;
5. The extent to which each option benefits to each component of the natural resource and/or service.
6. The extent to which each option takes account of relevant social, economic and cultural concerns and other relevant factors specific to the locality;
7. The length of time it will take for the restoration of the environmental damage to be effective;
8. The extent to which each option achieves the restoration of site of the environmental damage; and
9. The geographical linkage to the damaged site.

These criteria are complemented by a "safety clause" stipulating the following:

".. the competent authority is entitled to decide that no further remedial measures should be taken if .. the cost of the remedial measures that should be taken to reach baseline condition or similar level would be disproportionate to the environmental benefits to be obtained."

²² Article 7 of the Directive.

To start with, it will always be in the operator's interest to put forward the option which is least costly for him. Thus we can expect the competent authority, being aware of the operator's self-interest, to put more weight on other criteria than on criterion 2.

Secondly, criteria 6 and 7 incorporate elements of the economic approach. Furthermore, together with criteria 5, 8 and 9, they seem to have the effect of giving preference, all else equal, to more timely and comprehensive primary restorative actions. However, this preference is mitigated by the "safety clause". The latter is of special interest, since its implementation requires an evaluation of the "environmental benefits" of further measures as basis for a deciding whether further primary restoration should be carried out. Since this cannot involve any assessment via "contribution in kind", we could assume that these benefits could and would be assessed in accordance with the economic approach.

If this would indeed be the case, the option finally decided upon may lead to an intensity of primary restoration quite similar to that of the "optimal" option of the economic approach; this in particular if the "least cost" option preferred by the liable operator were less ambitious in primary restoration than the "optimal" option. Criteria 5 to 9 would then entice the competent authorities to press for more intensive primary restoration until a level would be reached where the operator could invoke the "safeguard clause" to prevent further intensification. But even if the primary restoration at that stage would be close to the socially optimal level, this would not necessarily mean that the costs for the operator would be close to the social costs. The operator would still have the obligation to carry out "compensation-in-kind" for the interim losses and there would not be any guarantee for the corresponding costs to equal the social costs of the interim damage.²³

Implementation issues

The analysis so far has shown that the two approaches, although appearing similar at the surface, may differ with respect to both the choice of the most appropriate restoration action and the amount of money the polluter (liable operator) will have to pay for the damage he has caused.

The main reason for this lies in the difference in determining the costs stemming from interim damage/losses. Whereas the economic approach uses the social cost relating to the damage, the environmental/legal approach requires compensation-in-kind and uses the cost for implementing the most appropriate compensating action.²⁴

²³ More speculatively, one may expect the operator's costs for the remediation generally to be smaller than the social costs of the damage. If this were not the case, we can expect the operator to invoke the safeguard clause and try to renegotiate the option selected.

²⁴ The search for the most appropriate compensating action, to compensate for a given choice of primary restoration action, is a choice problem which does not appear in the economic approach..

Should this difference lead us to prefer one approach before the other? The answer is not self-evident and ultimately depends, on the one hand, on issues of value and, on the other hand, on issues of implementation and political acceptance.

As to the latter, although the economic approach will, in theory, lead to “socially optimal” damage prevention (through internalisation of the social cost for damage) there are a number of difficulties with its implementation and acceptance.

For instance, the economic approach remains silent on who is to be the recipient of the funds payable by the liable operator for interim damage (areas A and C in *figure 1*). People adversely affected by the damage, as well as the general public, concerned with environmental issues, may dislike these funds to simply be paid into the public budget. However, this is not a serious argument against this approach. Nothing prevents the authorities from stipulating that the funds paid-in shall be used to compensate the people being adversely affected and for implementing the remediation implicit in the “optimal option”.

Similar arguments can be raised against the environmental/legal approach. In particular, people adversely affected “in the interim” may object to the fact that compensation for interim losses takes the form of improving the environment elsewhere, rather than compensating them for their losses. But again, this problem could be resolved, at least partly. For instance, an “optimal” compensation action, whose total costs are well-defined, could be mitigated by funds paid as compensation to affected parties. In the latter case, the compensation action would not be carried out to the full, but only to the extent that it could be financed by remaining funds. The latter would be defined as the residual, when deducting the financial compensation to affected parties from the costs for the compensation action originally foreseen. This rather cumbersome approach would, of course, be easier if steps 3 or 4 (in *box 2*) had been chosen as the general rule for designing compensatory actions.

In fact, the Directive, although being conceived as a public law instrument and not providing for private parties to have a right of compensation, provides some lee-way to the Member States for deciding whether such mitigation could be in place.²⁵ Furthermore, a majority of Member States applies at present laws providing for litigation of damage to private parties.

The main argument against using the economic approach in practice, in particular for evaluating interim damages, appears to lie in the difficulty of establishing non-use values. This is serious, since non-use values may constitute a large part of the total value of environmental sites. In the US, where the environmental/legal approach has been originally developed, there is a long-running inconclusive debate on whether various evaluation techniques applied to non-use values in the environment are practicable and reliable.²⁶ Based on a corresponding public criticism of evaluating non-use values, there

²⁵ Article 16.2 says “This Directive shall not prevent Member States from adopting appropriate measures, such as the prohibition of double recovery of costs, in relation to situations where double recovery could occur as a result of concurrent action by a competent authority under this Directive and by a person whose property is affected by damage.

²⁶ This point was re-emphasized by a US expert at a hearing organised by the European Parliament in autumn 2002.

is, in the US, an on-going pressure on the authorities to concentrate on primary restoration and to discard with compensation for interim damages. As a response, the federal authorities developed, over time, the alternative method of compensation in kind, which now has been taken on board by the Community.

Thus, the real issue at hand is not, how the compensation-in-kind approach compares with the social cost approach. It is rather, whether the compensation-in-kind approach is preferable to not providing for any compensation at all for interim losses.

One conceivable argument for the latter would be that Member States, as already mentioned, apply civil law regimes for compensating private parties for being adversely affected by environmental damages. However, those regimes typically cover only easily identified direct damages, such as, damages on properties and on commercial businesses. They do not cover use-values of the type of access to beaches or to national parks and, of course, leave non-use values completely out of the picture.

If the liability regime would be limited to easily identifiable adverse affects, this would constitute incentives for the liable operator to avoid costly active remediation of the damage, since a major “reward” for carrying out such remediation would be foregone. The compensation-in-kind approach, with all its intricacies, appears in this light to be a preferable solution. By being tailored to provide, as far as possible, resources of the same type and quality as those lost, weighing in services to the public in the comparison, it tends to provide a necessary counterweight to the natural wish of liable operators to minimise their costs for damage remediation. Thereby it appears to us to come closer to the ideal of “socially optimal” payment for pollution than the alternative of keeping compensation for interim damage out of the picture altogether.

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