

Working Paper

A General Overview of Environmental Liability and Pollution Prevention

Jaap Bouma
YSSP Participant 1993

WP-95-13
April 1995



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A General Overview of Environmental Liability and Pollution Prevention

1. Introduction

Organizations can be liable for their environmental impacts according to criminal law, private law, administrative law and international law. Environmental liability can create incentives for the prevention of environmental impact (ex ante effect), as well as provide compensation for those persons who suffer environmental damage (ex post effect). Environmental liability can be defined both broadly, including penalties and narrowly, including only the compensation to the victims of environmental impacts. In this paper, environmental liability is defined as compensation to those who suffer from a lack of environmental care during all phases of a product life cycle and penalties linked to that impact¹. This definition includes the compensation for damage at the workplace during production of a product. Also, penalties are explicitly included as the government, who receives the penalties, can be seen as the representative of the damaged parties². Although some authors include commercial losses in their definition of environmental liability, such as a loss of market and a loss of corporate image, these 'costs' of pollution are not included in the definition of environmental liabilities because no compensation is paid. Reduction in revenues, a consequence of commercial losses, is not an expense. However, court cases over liability issues can negatively influence corporate image and accordingly the sales of the corporation.

Although environmental liability is a governmental policy, it is not only 'handled' by governmental agencies. Citizens and foreigners may also claim compensation for suffered damage. Environmental impact is also not limited by national borders. Accordingly, victims of the environmental impacts of activities can be foreigners. Transboundary environmental impacts are usually not specifically addressed by national environmental law. Studies have been performed about the effects of national environmental legislation on decisionmaking processes. Environmental impacts with primarily local effects seem to be taken into consideration when decisions are made. However, environmental impacts with a less local effect (transboundary environmental effect) seem to be less regulated and/or enforceable. The territorial limits of administrative law is a reason for this. Therefore these effects are generally less internalized in the internal decision-making processes of organizations. However, in reaching a more sustainable development, decision-making processes should definitely take account of transboundary environmental impacts³. Environmental liability for transboundary effects is a potential incentive for firms to take transboundary external effects explicitly into account in their decision-making processes.

In this paper, I begin by describing the four legal sources for liabilities resulting from environmental impact, where I stress the potentials for transboundary environmental impact liability. In section three, I investigate these concepts with respect to the total life cycle of a product. The fourth section of this paper describes the potential influence of environmental liabilities on strategic decision behavior. Also, some impediments for the effectiveness of liabilities in establishing an incentive for pollution prevention are identified. The final part of the paper contains some conclusions with regard to the consequences of environmental liability.

In considering the impact of environmental liability on organizations, the distinction has to be made

¹ The total life-cycle of a product contains all the technical stages of a product: extraction of resources, material production, assemblage of the product, product use and product disposal.

² A liability that has been paid by a polluter must not necessarily be given to a victim personally. This is the case when a polluter get fined for defused environmental impact that resulted into environmental damage that is not traceable to personal injury or property damage. The amount of such fines can be directly related to the quantity of emissions.

³ For the definition we refer to: World Commission on Environment and Development; "Our Common Future"; Oxford; Oxford University Press, 1987.

between the ex ante and ex post effect. The ex ante effect of environmental liability appears to be almost always accompanied by other financial and other non-financial incentives for pollution prevention ('environmental care'). The policy-instruments that governments use to stimulate companies to reduce environmental impact can be divided into three categories:

1. Direct regulation: prescriptions in laws and compliance control to enforce emission norms ("Sticks");
2. Indirect regulation: (financial) incentives to reduce environmental impact ("Carrots");
3. Self-regulation: information and discussions between governmental agencies and companies to stimulate the companies to operationalize 'social responsibility' by minimizing environmental impact⁴.

Environmental liabilities, like emission taxes, are examples of indirect regulation. Permits to meet emission norms and the stimulation of environmental care systems are examples of direct and self-regulation to reduce environmental impact, respectively. As section four describes, environmental liability stimulates the introduction of environmental management systems that is itself a form of self-regulation.

This paper focusses mainly on environmental liability. However, when the behavioral consequences of liabilities are studied and strategic decision-making processes are described, other incentives to take environmental care are identified. As governments, like the Dutch government, increasingly aim to rely on changing the behavior of organizations by indirect and voluntary regulations, there is a need for more empirical data on actual decision-making processes within organizations and the way in which 'environmental' aspects are dealt with. The paper describes some preliminary⁵ results of a study within the Dutch electricity sector.

To outline the potential environmental liabilities of environmental impacts the term "environment" is defined broadly. "Environment" is defined as 'the whole of living and non-living elements of the environment, the elements of the environment, the elements themselves and the relationships between them, namely: water, air, human beings, animals, plants, products and the relationships between them: ecosystems, nature and landscape'⁶. The private law applies only to certain elements and relationships of this definition of 'environment'⁷. However, due to a rising environmental awareness, developments in private law will cover more environmental damage⁸. Also the other legal sources for environmental liability are developing towards covering more aspects of the environment. With regard to transboundary environmental impact, several treaties have emerged and enriched

⁴ See a further explanation: Winsemius, P., "Gast in eigen huis, beschouwingen over milieu-management", Alphen a/d Rijn, 1986.

⁵ The study within the Dutch electricity sector is part of a larger empirical study that focusses on how profit and non-profit organizations formulate environmental goals and the way in which it is dealt with environmental factors in strategic decision-making processes. Some results are described in: Bouma, J.J., F. Neumann, "Environmental Considerations in strategic Decision-making of a large Corporation within the Chemical Industry", presented at Conference "The Greening of Industry Network: Designing the Sustainable Enterprise, Tufts University, Cambridge, Massachusetts, U.S.A., November 14-16, 1993.

⁶ Plan Integratie Milieubeleid, Tweede Kamer, 1982-1983, 18010.

⁷ Gimpel-Hinteregger describes the restriction of Private Law with regard to environmental damage. As this author clearly formulates: "Ist ein Umweltmedium privatrechtlich zugeordnet, so wird auch der Schaden an diesem Medium vom Privatrecht erfasst". Gimpel-Hinteregger, "Der Umweltschaden im Oesterreichischen Privatrecht", Oesterreichische Juristen-Zeitung, 4. September, 47. Jahrgang, Heft 17, pp. 561-572, 1992.

⁸ Consider for example in the Jurisdiction of EC-countries. "Vorschlag für eine Richtlinie des Rates über die zivilrechtliche Haftung für die durch Abfälle verursachten Schäden", ABL der EG Nr C 251/3, 4.10.1989 (revised proposal C 192/6, 23.7.1991). "Vorschlag für eine Richtlinie des Rates über Abfalldeponien" ABL der EG Nr C 190/1, 22.7.1991.

international law.

The legal sources for liability can be categorized according to how environmental impact results in damage. Lambers (1979) describes two categories. The first category is covered mainly by administrative law. The second category is mainly covered by private law. The two categories are:

- 1- Damage to the quality of water, soil, and air; damage to animals and plants separately as well as ecosystems as a whole; damage to the physical environment of human-beings and resulting by their behavior.
- 2- Damage to the health of human-beings and their properties resulting from environmental impact of human behavior on their physical environment⁹.

Focussing on only one legal source is incomplete as both sources supplement each other¹⁰. When the consequences of environmental liability are studied all potential sources (private law, criminal law, administrative law and international law) should be taken into account. Although environmental liability itself is monetary, one should be aware of the potential substitution with incarceration. This results from the fact that penalties can imply both monetary payments as incarceration. Both the number of cases that result in monetary payments and the amounts of the damage payments are rising in the United States and the European Union (EU)¹¹. In some literature a distinction between monetary penalty and incarceration penalty is made. Segerson and Tietenberg (1992)¹² did a study in that they temper the traditional economic standpoint that legal monetary liability's for an organization are, due to lower transaction costs, more efficient than incarceration penalty's for individual participants of an organization. However the two categories of environmental liability are not exclusive. Courts in the US and EU member states treat individual and corporate liability as complements, not as substitutes.

The general overview of the sources for environmental liabilities, described in the next part of the paper, refers to the United States and Western Europe. When it is focussed on the influence of environmental liability in stimulating pollution prevention it refers to the West European context.

2. An overview of the legal framework that establishes liabilities

In the USA, two specific environmental liability laws are especially relevant: the Comprehensive Environmental Response, Compensation and Liability Act and the Oil Pollution Liability Act. Each made it possible to raise revenues for cleaning up hazardous waste sites and oil spills, respectively. In addition to these forms of administrative law, also private, criminal and international law can hold polluters liable for their environmental impact. This applies as well to western European countries; however, the necessary presumptions for a polluter to be held liable and the extent of liability varies among the different countries. The European Union issued a policy-document (referred to as the 'green paper') that describes the intention of the Commission of the EU to adapt the civil liability system within the EU. Also the Council of Europe formulated a convention (The Convention on Civil Liability for Damage to the Environment) that is to be signed by the EU, EFTA countries and some

⁹ Lambers, C., 'Milieuschade en het agrarisch bedrijf: Preadvies voor de Belgische en Nederlandse Vereniging voor Agrarisch Recht', in: De pacht 1979, page 14.

¹⁰ Gimpel-Hinteregger, "Der Umweltschaden im Oesterreichischen Privatrecht", Oesterreichische Juristen-Zeitung, 4. September 1992, 47. Jahrgang, Heft 17, page 565.

¹¹ See for the increase of established environmental liabilities: US Environmental Protection Agency, "Summary of criminal prosecutions resulting from environmental investigations", Office of Enforcement and Compliance Monitoring, 30 September 1990. Pollution Prevention June 1993, "Cost-Benefit analysis should include environmental risk", pp. 44 - 48.

¹² Tietenberg, T.H.(editor); Innovation in environmental policy: Economic and legal Aspects of Recent Developments in Environmental Enforcement and Liability; Edward Elgar Publishing Limited; England, 1992.

former Eastern bloc countries, that shows the development of a civil liability system into an environmental policy instrument. In this section, the four legal sources of environmental liability are described. It is also shown that transboundary environmental impact can result in considerable environmental liabilities.

Criminal law establishes criminal sanctions to enforce environmental regulations. Since the eighties the criminal enforcement of environmental offenses has increased. A crime (as opposed to a tort or administrative violation) generally involves intent, is publicly enforced, and does not require actual victim harm. In contrast, a tort does not require intent, is privately enforced, and the plaintiff must establish damages¹³. Because torts are generally established to compensate victims for the suffered damage, private law is a traditional source for environmental liabilities (paragraph 2.2). In contrast, criminal penalties are primarily designed to punish. Yet, in some cases a penalty might be viewed as a compensation to the government as a representative of victims and as such criminal law can be viewed as a source for environmental liabilities (paragraph 2.1). Administrative violations are publicly enforced, do not require actual damages and are not generally predicated on intent. Sanctions are generally established to prevent future violations¹⁴. Administrative laws that have arisen for forcing polluters to pay for the clean-up of soil contamination has rendered administrative law a major source for environmental liabilities (paragraph 2.3). International law (paragraph 2.4) is a major source for environmental liability that results from transboundary environmental impact. Although also private, administrative and criminal law can be applied to cases of transboundary pollution.

2.1 Criminal Law

Criminal law codes can hold members of organizations liable for environmental impact. These liabilities include:

- Criminal fines paid to the Government as a representative of the victims of the environmental damage;
- Restitutions to victims or compensation that is paid to prevent an actual court case. Because both the defendant and the plaintiffs can reduce legal expenses by settling out of court a considerable number of cases end with an agreement between the parties involved.
- Court-ordered payments to victims or other third parties that are made as part of a formal plea agreement¹⁵.

In this paper, I consider environmental liability to be linked directly to the environmental damage, therefore fines for violating environmental regulations, etc., are not viewed here as environmental liability. This distinction is significant to the extent that the liability represents an internalization of environmental damage to the polluter. Responses in decision-making behavior are not different for the two kinds of fines.

As an alternative or in addition to monetary liabilities, criminal law can impose non-monetary criminal penalties, such as jail sentences which may be more effective in changing decision-making

¹³ See Coffee, J.C., Jr, "Does 'unlawful' mean 'criminal'?: reflections on the disappearing tort/crime distinction in American law", Boston University Law Review, 1991.

¹⁴ See: Cohen, M.A., "Criminal Penalties", in: Tietenberg, T.H., (main editor), "Innovation in Environmental Policy: Economic and Legal Aspects of Recent Developments in Environmental Enforcement and Liability", Edward Elgar Publishing Limited, England, 1992.

¹⁵ *ibid*, page 84.

behavior¹⁶ According to some authors, incarceration is advocated. Segerson and Tietenberg (1992) explicitly derive the need for jail solely on the basis of the inadequacy of monetary penalties to deter unlawful behavior¹⁷. In this paper non-monetary sanctions are not considered liabilities. Criminal fines can be accompanied by several other monetary sanctions, some of these are liabilities. The following paragraphs describe potential environmental liabilities that can result from other sources (private, administrative and international law).

Sometimes probation is substituted for criminal sanctions. Cohen gives two noncontroversial purposes for putting companies under probation¹⁸. Firstly, companies can be placed on probation to collect a fine over time. Secondly, it is a method of reinstating a suspended sentence in case of repeat criminal violation. Nevertheless, the polluter can be confronted with monetary sanctions because criminal sanctions can be only a part of the total sanctions. There seems to be a trade-off between incarceration and monetary compensations. There are cases where the individual president of a firm asks for this shift to prevent himself from being sued by shareholders for the behavior that resulted in environmental impact and accordingly to a negative impact of monetary sanctions on the stock prices¹⁹.

An example of the combination of sanctions linked to environmental impact is the following US-case. Due to storing, transporting and disposing of hazardous waste without a permit, a chemical company in Georgia (Spartan Trading Co., Inc.) was liable for a clean-up by the Environmental Protection Agency (EPA) at the total expected amount of 138,265 Dollars. The total sanction contained a restitution by the company to the EPA of only 10,000 Dollars plus the difference between the expected cleanup costs and the actual cleanup costs and the incarceration of the owner of one year²⁰.

With regard to transboundary environmental impact, the liabilities that are enforced under criminal law are rare. When the Dutch city of Rotterdam conducted research on the Rhine river to get insight in the possible legal actions to enforce reductions of emissions of chloride by French Potassium Mines, a criminal action was considered to be an unfavorable option. The Rhine study summarizes the following disadvantages:

- evidentiary procedures are complicated and costly;
- expert testimony is expensive;
- burden of proof is on the prosecution;
- the harm has already been caused;
- a criminal penalty, usually a fine, probably will not even cover the cost of litigation; even if a prison sentence were to be imposed the defendant would be released after a short period of incarceration;
- no incentive for other dischargers to discontinue the polluting activities;
- Rotterdam will not have an opportunity to influence the outcome of the case, since the issue is of relevance at a national and not merely a local level²¹.

¹⁶ Cohen shows that during the period between 1 January 1984 and 30 September 1990 more than 50 % of the corporations sentenced for environmental offenses at federal level involved individual codefendant. Cohen, M.A., "Criminal Penalties", in: Tietenberg, T.H., (main editor), "Innovation in Environmental Policy: Economic and Legal Aspects of Recent Developments in Environmental Enforcement and Liability", Edward Elgar Publishing Limited, England, 1992.

¹⁷ *ibid*, page 80.

¹⁸ *ibid*, page 88

¹⁹ *ibid*, page 93.

²⁰ US Environmental Protection Agency, Summary of criminal prosecutions resulting from environmental investigations", Office of Enforcement and Compliance Monitoring, pp. 82, 30 September 1990.

²¹ Dunne, J.M., van (ed.), "Transboundary Pollution and Liability: the Case of the River Rhine", Proceedings of an International Conference, held in Rotterdam, 19 October 1990, pp. 14-15, Koninklijke Vermande, 1990.

Other authors also conclude that criminal law is a less suitable route for obtaining compensation for environmental damage²². These authors mention that only by exception is a victim compensated²³.

The Rhine study suggested that the city of Rotterdam start civil action against the French Potassium Mines. Administrative law was not seen as a potentially good option, since it is a better instrument within national boundaries. Even a treaty was, in the first instance, not seen as a good option. Theoretically, a treaty could result in changes in French administrative law and accordingly influence the emissions of the French Potassium Mines. However, the French government refused to ratify the Bonn Salt Treaty of 1976²⁴, which was intended to reduce the chloride emissions. Besides this, the Rhine study concludes that "Even where a treaty or national legislation is explicit, the license in question abundantly clear and measures cannot be suspected, the authorities are reluctant to take drastic actions (for instance closing factories) against otherwise reputable concerns whose activities are important to the national economy"²⁵. Although civil action was originally viewed as a good option, the Bonn Salt Treaty was revised by signing an additional Protocol in September 1991²⁶. This legal solution contains several compromises as was expected by the Rhine Study²⁷. However, civil actions can be fruitful as in other cases (for example civil actions by Dutch nurserymen against the French Potassium Mines, the so-called MDP case) show. In the next section, private law as a source for environmental liabilities will be explored.

2.2 Private Law

2.2.0 Introduction to legal liability under Private Law

In addition to criminal sanctions, private law (tort law) can establish monetary liabilities for a polluter. From a governmental point of view, private law can improve environmental quality. This view has recently been operationalized more explicitly in countries where private law contains the possibility for private groups not directly personally affected (including environmental pressure groups) to sue a polluter²⁸. This is for example the case in The Netherlands where environmental pressure groups face circumstances under which they can sue a polluter. However, as a consequence of the perceived negative influence on the economic development, the conditions under which environmental pressure groups can sue, have recently been narrowed.

²²see Weiffenbach, B.M.M.; "Justitia en Mercurius. Materieelrechtelijke tendensen in het internationaal-privaatrechtelijke conflictenrecht bij grensoverschrijdend milieuvuiling"; in: Environmental Liability law Quarterly; pp. 1-11; February 1989.

²³ An example of a criminal action that resulted into the payment of compensation is the Montedison-case. See: Siehr, K., "Grenzüberschreitender Umweltschutz", pp. 376-398, VersR., 1987.

²⁴ 3 December 1976, Bonn, Trb. 1977, 33.

²⁵ see note 17.

²⁶ Brussels, 25 September 1991, Trb. 1992, 3.

²⁷ The Protocol enforces France to ensure that the content of chloride at the German-French border does not exceed 200 mg/l. Chloride will be temporarily stored by the French and when the production of the Mines decreases (after 1998) this will be emitted into the Rhine. Also the Netherlands will also take measures to reduce the chloride emissions into their 'Surface Water'. The total costs of all activities to reduce chloride emissions will be paid for 30 % by Germany, 30 % by France, 34 % by the Netherlands, and 6 % by Switzerland. The expenses are not divided according to the amounts of emissions (the Dutch pay much more). The payments of the Dutch are 'side-payments': payments to achieve emission reductions that otherwise would not have been achieved. See: Nollkaemper, A., "Progressie en stagnatie in het internationale regime voor grensoverschrijdende waterverontreiniging" in: Tijdschrift voor Milieurecht, pp. 11-23, Aflevering 1, W.E.J. Tjeenk Willink, Zwolle, The Netherlands, January 1993.

²⁸ This would also be provided in the Austrian Private law if the proposed Environmental Liability Act came into force. This proposal would make it possible for those individuals who are personally involved ("die in absoluten Rechtsgutern betroffen sind" and environmental pressure groups ("Verbände") to sue polluters in a private law case. See further: Berger, W., P. Madl, C. Smelz; "Zum Entwurf eines Umwelthaftungsgesetzes"; Oesterreichische Juristen-Zeitung; June 19. 1992; 47. Jahrgang, Heft 12, pages 393-406.

In the last two decades, private law has increasingly been resorted to for extracting compensation by suing polluters for private property damage. Due to some perceived shortcomings of common private law additional acts in administrative law (see paragraph 2.3) have also come into force to require polluters to pay their victims compensation by civil actions.

When jurisdictions are compared, the following differences in the stringency of liabilities that result from private and administrative law can be identified:

1. Traditional fault liability.
2. Fault liability and requiring the defendant to prove its innocence.
3. Strict liability. In this regime the fault criterium is discarded in theory, but the defendant can still escape liability by showing that the incident was caused by factors entirely beyond his control.
4. Absolute liability. This regime is more stringent than strict liability in that the polluter can not avoid liability by showing that the incident was of his or her control.

Traditional fault liability is liability where the plaintiff has to prove that the defendant is the polluter and that the polluter committed a "fault". In the case of "fault", it must be shown that the polluter could have avoided the damage if "due care" had been exercised. Traditionally, "fault" was shown if the polluter had not been in compliance with the rules and regulation of the time. As the regime for environmental liabilities becomes more stringent the burden of proof is on the polluter instead of the victims²⁹. This regime can be still stricter by using different criteria to define "fault". For example, Dutch courts sometimes conclude that the polluter committed a fault when the behavior, that resulted in pollution, clashes with norms regarding the care that persons should take with regard to one other. The subjectivity of 'fault liability' is described by Flemming (1967) when he explores the conventional elements of liability under private law³⁰. Flemming presents five elements of delictual liability: (1) A duty to conform to a legally prescribed standard of care, that of the "reasonable person", for the protection of the plaintiff from the kind of harm giving rise to the suit. (2) Measuring behavior against the recognized standard, or determining the existence of a breach of a duty is for the jury. (3) The occurrence of actual injury. If no harm stems from an individual's breach of a duty there can be no basis for liability. (4) A "reasonably proximate" causal link, known as "the proximate cause" between the breach of the duty and the harm. (5) The absence of prejudicial conduct by the plaintiff which contributed to his harm. This defense still defeat the plaintiff's claim in certain jurisdictions. In others it merely reduces his recovery in proportion to its effective contribution to the injury sued upon.

Strict liability means that compensations is paid independent of negligent conduct. The ownership of a hazardous material may be sufficient for becoming liable for the damage caused by this material. Even stricter is absolute liability that ensures that pollution costs are invariably internalized so that the "market deterrence" will presumably operate more effectively under this type of regime.

In the case of transboundary pollution, injured parties increasingly turn to private law for seeking compensation. The case in which Dutch plaintiffs got compensation from the French Potassium Mines contributed significantly to this development³¹. An essential presumption for this instrument to become effective and fair is access to the court. Equal access means that an injured party that is

²⁹ Braams, W.Th in: Koeman, N.S.J., W.J. Ouwkerk, J.M. van Dunne; "Civielrechtelijke aansprakelijkheid voor Milieuschade"; pp. 50 - 51, Vereniging voor Milieurecht 1987-4, W.E.J. Tjeenk Willink Zwolle, 1987.

³⁰ Flemming, J., "An introduction to the Law of Torts", pages 25-26, 1967.

³¹ Dunne, J.M., van (editor), "Transboundary Pollution and Liability: the Case of the River Rhine", Proceedings of an International Conference, held in Rotterdam, 19 October 1990, pp. 147-154, Koninklijke Vermande, 1990.

located in a jurisdiction other than the jurisdiction under which the polluter operates has access to the courts of the polluter's country. A question then arises of which country's law is appropriate. Both the jurisdiction of the polluter and that of the injured party are theoretically possible. Finally, a presumption for the effectiveness of private law is that the decision of the court is enforceable.

The choice of court is linked to the States that are involved. If the polluter is located in the EU then the European Execution Treaty (EEX-treaty) is relevant. This treaty contains a steering principle that the court of the country of the polluter is preferred, in which case the victim must choose the court of his country³². If the countries do not belong to the EU, the victim can choose the court. Although Article 10 of the 1971 Hague Convention on the Recognition and Enforcement of Foreign Judgements in Civil and Commercial Matters would appear to favor vesting of jurisdiction in the polluter's court, Article 10 (3) might possibly favor the victim's court in cases involving injury to real property.

In cases of transboundary pollution the question of relevant law is highly dependent on the sums of environmental liabilities involved. Although the EU strives for harmonization, there are considerable differences with respect to the choices victims have in choosing the applicable law: the law of the country where the polluter is situated or the law of the country where the damage occurred. For example, in Germany the victims of foreign environmental impact can choose the most stringent (and therefore most beneficial) law. However, German polluters do not have to fear that more stringent foreign law will be applied to them³³. The latter requires a victim in another EU-country to sue a German polluter under a more stringent law. Finally, a relevant option in the case of transboundary pollution for the plaintiff concerns the choice of the judge. It is possible to choose for a foreign judge or the judge of the country of the plaintiff. The latter is only possible if the judge is master of the foreign Private Law.

Even if transboundary liability and compensation can be determined by a national court, this would not guarantee that the victim receives the compensation. Besides the problem that a polluter may not be financially able to pay, the foreign court in the polluter's country. Especially for the countries outside the EU the lack of enforcement is problematic for compensation. With regard to Eastern European countries the Polluter Pays Principle is difficult to implement, and the western countries who suffer under transboundary pollution from Eastern Europe sometimes subsidize technologies that reduce environmental impact in Eastern Europe.

To some degree The Commission of the EU endeavors harmonization of civil liability. In the process of harmonization directives, like the proposed Directive on Civil Liability for Damage caused by Waste, are of great importance. The general opinion of the Commission of the EU on civil liability is described in the so-called 'green-paper' that was issued in order to consult the governments of the Member States, industry and business community (insurance companies, banks, etc.) and environmental pressure groups for their opinion on civil liability. In the 'green paper' it is opted for strict liability with some limitations. The limitations result from fencing in strict liability for only

³² As Weiffenbach concludes: "The court of the European Communities decided in the MDPA case that in a case of transboundary environmental pollution the injured party has the option of instituting its action either in the place where damage occurred, the so-called "Erfolgsort", or in the place of the of the event causing it, the so-called "Handlungsort". See: Weiffenbach, B.M.M.; "Justitia en Mercurius. Materieelrechtelijke tendensen in het internationaal-privaatrechtelijke conflictenrecht bij grensoverschrijdende milieuvervuiling"; in: Environmental Liability law Quarterly; pp. 1-11; February 1989.

³³ See Kegel, G., "Internationales Privatrecht", Muenchen, 1987. Kohler, Ch, "Unterlassungs- und Schadenersatzklagen wegen grenzueberschreitenden Umweltbeeintrachtigungen im internationalen Privat- und Verfahrensrecht" in: "Grenzueberschreitender Umweltschutz in Europa", Heidelberg, 1984. Rest, A, "Die Wahl des guenstigeren Recht im grenzueberschreitenden Umweltschutz/ The more favorable law principle in transfrontier environmental law, a means of strengthening the protection of the individual", Berlin, 1980.

specified 'environmentally dangerous activities'. Environmental damage resulting from other kind of activities should be dealt with by liability based on fault. Generally, the liability is channeled to the operator of these activities and it is opted for the introduction of a mandatory liability insurance for the operator. In addition for environmental damage that can't be covered a separate damage fund is considered. These funds can be used to repair environmental damage that can't be covered under civil liability law as a result of, for example, insolvency or inability to identify the responsible party. The green paper describes several options to finance the proposed fund³⁴.

The 'green paper' shows that there are still several issues (like mandatory insurance, compensation funds, etc.) linked to the proposed policy on civil liability that are open for discussion. The reactions of the International Chamber of Commerce, banks, insurance companies, environmental pressure groups show that the opinions on the 'green paper' vary widely. Besides these impediments for harmonization of civil liability systems within the EU, it can be concluded that even if the substance of the law and procedures as regards civil liability were to be completely harmonized (which is not proposed in the green paper) there would remain significant differences between the Member States as regards the likelihood of action being taken against polluters³⁵. This may result from differences in the costs and accessibility of lawyers and the courts.

2.2.1 Extent of compensation

The relevancy of the jurisdiction for compensating pollution victims becomes clear when differences in the amount of compensation are taken into consideration. With regard to compensation for damage the following distinction has to be made:

- 1- Damage that can easily be expressed in monetary terms; and
- 2- Damage that cannot be easily expressed in monetary terms (intangible damages). Claims can be rejected if the damage is 'too indirect, remote and uncertain'^{36 37}.

'Limits of compensation', as the term suggests, limit intangible damages in order to protect enterprises or activities from extreme potential financial burdens, especially activities that provide jobs or are otherwise beneficial for the present generation. International treaties often include these kinds of limitations. A reason for these liability limits is that the high financial costs of insurance for extreme events, in addition to the ex post financial consequences of imposed liabilities, would endanger the development of activities like nuclear energy production³⁸. Another important condition for establishing liability and compensation with respect to private law code is the necessity to prove causality. Although conditions for proving causality differ in different legal systems, the activity has to be a condition under which the damage arose ('Conditio sine qua non-criterium'). In most legal systems, it is not sufficient to show a likelihood that the damage is a result of other factors. Some possible impediments to the proof of causation are the cumulative and gradual nature of the injury,

³⁴ Tijdschrift voor Milieuaansprakelijkheid, Environmental Liability Law Review, blz. 6, nr. 1, Koninklijke Vermande, 1994.

³⁵ See Jones, B. "Remedying Environmental Damage: The European Commission's Green Paper", in: Tijdschrift voor Milieuaansprakelijkheid, Environmental Liability Law Review, pp. 1-7, nr. 1, Koninklijke Vermande, 1994.

³⁶ OECD, Legal Aspects of Transfrontier Pollution, page 289, 1977.

³⁷ In the US decisions of Courts show the difficulty to get intangible damage compensated. Dewees follows Abraham and Huber by noticing that recent Court decisions in the US have allowed recovery for creating the fear of contracting cancer, and for creating the need for medical monitoring. However, Dewees concludes that it is not possible to collect damages for increased risk of future disease. See Dewees, D., "Tort Law and the Deterrence of Environmental Pollution", in: T.H., Tietenberg, T.H.(editor); Innovation in environmental policy: Economic and legal Aspects of Recent Developments in Environmental Enforcement and Liability; Edward Elgar Publishing Limited; England; 1992.

³⁸ Treaty of Paris, June 29 1980; See for a reflection on the channelling of liabilities: Koeman, N.S.J., W.J. Ouwerkerk, J.M. van Dunne; "Civielrechtelijke aansprakelijkheid voor Milieuschade", Vereniging voor Milieurecht 1987-4, page 140, W.E.J. Tjeenk Willink Zwolle, 1989.

a number of concurrent sources contributing to the injury, and the difficulty to trace pollution to its source. However, these impediments are sometimes tempered when courts draw inferences from circumstantial evidence, or by creating presumptions and reversing the burden of proof.

Other potential impediments are the restrictive period in which a victim can place a claim and the restrictions on accepting the parties as victims. In most countries the claiming party must be personally involved as an owner (or tenant) of the property that suffers the environmental damage. Also the provisions for joint liability differ among countries, which affects the possibility of receiving compensation. In the case of multiple sources of environmental impact, joint liability means that, the polluters can be sued together.

The barriers to victim compensation under private law depend on a number of factors including the jurisdiction involved and the environmental media. The media of the environmental impact (Air, Water, Soil, Noise) can determine what environmental rule is relevant. Even within the same jurisdiction different environmental laws may have different requirements for liability. These requirements or rules are part of the body of administrative law, which determines if an activity that leads to damage is legal. In the absence of strict liability, administrative law will greatly influence the amount of liability.

Finally, the degree to which organizations in a jurisdiction have a 'financial responsibility' can influence the extent to which compensations are actually being paid. 'Financial responsibility' means that there are legal provisions to oblige organizations to ensure that they can cover potential compensation expenses. In some countries, insurance is required³⁹. Other countries may require only a guarantee that organizations can cover liability costs, e.g. with a bank guarantee.

2.3 Administrative Law

Governments in the USA and EU-member states obliged to protect the environment⁴⁰. Environmental laws that establish directives and regulations have become a prominent part of administrative law⁴¹. Within the USA and EU-member states, these laws establish norms with regard to environmental impact. Traditionally, the administrative laws were medium specific. This means that each medium (water, air, soil) has its own administrative laws that require, e.g. norms for emissions to the medium and the establishment of environmental liabilities. Because these laws often result in the transfer of pollutants from one medium to another, there are legal developments towards integration, or integral laws and regulations that cover all the media.

Although environmental liability is defined above as belonging to 'indirect regulation', it is very much interwoven with 'direct regulation'. Firstly, in the case of showing negligence, it must be shown that the polluter violated administrative law norms. The environmental impact and the related damage above these standards is the basis for environmental liability. Secondly, administrative law contains acts that focus on the cleanup of past environmental damage, which opens the possibility for the government to require that past polluters pay for these cleanups. The Comprehensive Environmental

³⁹ Examples of compulsory insurance are the large number of maritime states who ratified the International Convention relating to civil liability for oil pollution damage. The main features of this convention are: (1) strict liability imposed on the shipowner; (2) limitation of this liability to an amount of 133 Special Drawing Rights (SDR) per ton of the tonnage of the ship with a maximum of 14 million SDR; (3) compulsory insurance of the above-mentioned liability. Trb. 1977, 77.

⁴⁰ Some constitutions state explicitly the protection of the Environment as a governmental task. See for example article 21 of the Dutch constitution ("grondwet").

⁴¹ Direct regulation contains not only laws but also guidelines by Ministries.

Response, Compensation and Liability Act (CERCLA) and the Oil Pollution Liability Act are two american examples. The interim Soil Cleanup Act ("Interimwet Bodemsanering, IBS) is a similar Dutch example. Bierbooms and Bot describe the goals of this Dutch law and the governmental directive with regard to the contamination norms (A, B and C-value) above which the soil has to be cleaned up^{42,43}. The authors conclude: "Finally, the question of the objectives of the clean-up must be answered. The point of departure is: restoration of a good soil quality, a multifunctional soil. Under the new system (after the implementation of the governmental directive with regard to A, B, C norms)⁴⁴ the A value is the standard by which to determine the target value. The A value is ascertained by the concentration level of substances in the soil where negligible risks are posed to the public and the environment. If the A value is exceeded the soil is no longer multifunctional"⁴⁵. However this A value is not in all cases the norm above which contamination has to be cleaned up. The governmental directives make distinctions in the functions soil has to fulfill. Next to the environmental aspects, technical and financial (location specific) circumstances are taken into consideration to determine if a cleanup will be necessary and accordingly whether polluters are liable for the clean-up costs.

The role of acts that belong to administrative law in the establishment of environmental liabilities under Private law is well documented in court cases under private law⁴⁶. The environmental liabilities that organizations face in The Netherlands provide examples of such court cases. Liability for the costs of cleanup of soil pollution on the basis of Article 21 of IBS and since may 1994 on the basis of Article 47 of Act for Soil Preservation (WBB), is based on ordinary liability for negligence (see paragraph 2.2.0)⁴⁷. The government can sue private organizations or persons to recover the expenses of clean up. The private organizations can defend themselves by referring to the general theory of tort law. Van Dunne summarizes these common defenses as the following:

1. The requirement of negligence (on the basis of fault) is not fulfilled;
2. Under the standard 'state of the art' the polluter was not negligent at the time, the damage was not foreseeable;
3. The act of pollution was not negligent against the State seeking compensation for cleanup costs;
4. There is no relationship between the act and the damage (causation)⁴⁸.

⁴² Bierbooms, P.F.A., Bot, T.W.M., "Wanneer is er sprake van 'ernstig' gevaar bij de bodemverontreiniging? Normerende werking leidraad bodemsanering en de nieuwe bodemsaneringsaneringnormen", in: TMA, Environmental Liability Law Review, Koninklijke Vermande, nr.1, 1993.

⁴³ France, England and Germany followed the Dutch government in using the same values for contamination to determine if a cleanup is necessary and if past polluters can become liable for that damage that has to be recovered.

⁴⁴ In 1983 the Dutch Ministry for Environmental affairs implemented the so called Guidelines for Soil Cleanup with its numerical value system (the A, B, and C values), in order to determine whether a 'serious danger' arose and a cleanup is necessary. Although this guideline had no legal status it determined if the state was entitled to recover the costs of an investigation and cleanup. It was used to interpret the IBS. If the concentration of the contamination are below the A value no issue of soil pollution arises. The B value is the value above which on the short term a further investigation is desirable and the C value indicates that a cleanup is desirable.

⁴⁵ Bierbooms, P.F.A., Bot, T.W.M., "Wanneer is er sprake van 'ernstig' gevaar bij de bodemverontreiniging? Normerende werking leidraad bodemsanering en de nieuwe bodemsaneringsaneringnormen", in: TMA, Environmental Liability Law Review, Koninklijke Vermande, nr.1, 1993.

⁴⁶ Up to december 1991 tried the Dutch government to make 153 private companies liable for the cleanup of soil contamination. This resulted into 96 court decisions. For the publications of these decisions see: Meijenfied, H.G., "Interimwet Bodemsanering: ontmoetingsplaats en strijdtoneel voor juristen en technici", TMA, Environmental Liability Law Review, nr.1, pages 76-84, 1993.

⁴⁷ See for the conditions for legal liability under Dutch Private Law: article 1401 Civil Code and article 6:162 new Civil Code.

⁴⁸ Dunne, J.M. van, "Aansprakelijkheid en verweren bij bodemverontreiniging uit het verleden", in: TMA, Environmental Liability Law Review, pages 98-104, Koninklijke Vermande, nr.3, 1992.

With regard to the role that administrative law has in defining environmental liability, the second defence is especially interesting. Apparently, the polluter is not liable for past pollution if at that time there were no or low legal standards for the pollution. However, the Dutch courts decided that organizations have and did have the obligation to investigate and to warn others of potential damage to the environment or public health. In actual court decisions, the specific characteristics of the case are taken into consideration (case law). A main criterium for liability concerns the objective state of technology. This means that what is known in a particular branch of industry at a particular point in time was decisive in answering the question if the organization should have had the information about the potential environmental damage for which the organization is potentially liable. Other arguments that the courts consider are⁴⁹:

1. Large companies should be aware of technology that is publicized in scientific publications. This knowledge has an international character, e.g. a Dutch daughter-company can be imputed technical knowledge that exists with the foreign parent company⁵⁰.
2. Organizations have a far-reaching duty to investigate.
3. A company's involvement with certain substances establishes the company's responsibility to the available knowledge in the particular branch of industry concerned.

Administrative Law may result for companies into large financial liabilities that result out of environmental impact of activities in the past. Both in the USA (under CERCLA) as in The Netherlands (under IBS and WBB) polluters put great efforts in juridical means to prevent such financial liabilities. In the USA it is noticed that as result of juridical defence only 63 locations of 38.000 polluted locations have been cleaned-up and high legal expenses both by companies and government. As a result of these high transaction costs of the Superfund (The fund raised by collected liabilities and accordingly to be allocated at soil clean-ups) is even said to be a failure⁵¹.

With regard to transboundary environmental impact, administrative law also applies in the sense that organizations can face the administrative law of other countries, namely those countries where the damage occurred. The next section describes international law as a legal source for liabilities that result from transboundary environmental impact.

2.4 International law

Although administrative law attempts to reduce environmental impact by for example imposing standards, there can arise environmental damage from the 'allowed environmental impact'. Victims can be compensated for this damage under private law in the case that liability is not based on negligence. As environmental impact often crosses national borders, the victims may live in another jurisdiction with their own private and administrative law. It is therefor that there are several international treaties to cope with transborder environmental damage in order that these victims can be compensated for damage. In a sense the potential polluters also benefit from these treaties in that they provide more certainty with regard to the possibility of financial liabilities. This makes strategic planning easier.

These developments in international law can be traced to the sixties with regard to 'dangerous

⁴⁹ See for a further explanation of the arguments: Wubs, B.B., "Het 'State of the art' verweer in procedures krachtens art.21 lid 1 Interimwet Bodemsanering", TMA, Environmental Liability Law Review, nr.3, pages 89-97, 1992.

⁵⁰ See for a further description of the international character of available knowledge in defining legal liability: Dunne, J.M. van, Snijder, E.E.I., "Asbest en aansprakelijkheid", TMA, Environmental Liability Law Review, Asbestos Special, page 60, 1991.

⁵¹ This is the opinion of the International Chamber of Commerce. See: Tijdschrift voor Milieuaansprakelijkheid, Environmental Law Review, page 15, nr. 1, Koninklijke Vermande, 1994.

activities' that might result in nuclear damage. The treaty of Brussels summarize its requirements for liability⁵². After the Tsjernobyl accident, negotiations are continuing about the establishment of financial securities to cover the potential liabilities⁵³. However, the environmental damage that resulted from this nuclear incident hasn't been covered by any formal liability requirement. The damage from oil pollution resulting from international oversee transport has also been the subject of treaties to settle potential liabilities⁵⁴. These treaties focus only on oil pollution; however, recent international treaties address multiple pollutants by focussing on activities. These developments are apparent in the (Draft) Convention on Civil Liability for Damage caused during the Carriage of Dangerous Goods by Road, Rail and Inland Navigation Vessels. This convention focusses on hazardous materials generally and not only one category. However, the convention has not been ratified, probably because it requires strict-liability with regard to oil pollution⁵⁵.

The Council of Europe has continuing deliberations about harmonizing the national regulations with regard to damage that results from non-moving dangerous activities. This resulted into a draft convention on Civil Liability for Damage resulting from Activities Dangerous to the Environment. The primary objective of the convention is to make it possible to obtain fast and effective compensation for damages affecting the environment, as well as damages to persons and goods, inflicted by the exercise of location-bound hazardous activities⁵⁶. Victims and polluters of transboundary environmental impact benefit from a ratification of this draft convention by its harmonizing effect (more certainty about potential liabilities). However, the circumstances under which a victim can sue a polluter still depends on national law (administrative and private law)⁵⁷. In the next paragraph the 'liability system' that the convention implies for the signing countries is described more extensively. The term liability system is used to indicate the approach that is followed with regard to the 'product life cycle analysis' and the chosen stringency of liability.

Also the Commission of the EU has a draft directive to harmonize environmental liability for damage that results from hazardous waste. This is the follow-up from the EU-directive 84/631/EEG of 6 December 1984 which gave the Council of the EU the task to decide on the procedure for assigning responsibility to producers or persons for environmental damage that results from waste. The above draft convention of the Council of Europe (of which the EU is a member) focusses on hazardous activities. The draft directive of the EU with regard to environmental liability for damage that results from waste focusses on waste and not on activities. Although there are similarities between the objects of both drafts have different liability systems. In October 1991 The Commission of EU announced that it would not progress the proposals on civil liability for waste until a larger consultation with industry and other parties had been taken place. For this Reason the Commission of the EU issued the 'green paper' I described in paragraph 2.2.. It is still unclear how the different liability systems advocated by proposals in Directives of the EU and the convention of the Council of Europe will be coordinated. In the next paragraph both liability systems are described. It will be shown that they take different approach in changing the behavior of organizations that are potential polluters.

In addition to Europe, several treaties have emerged from the United Nations Environmental Programme, that try to achieve more clarity in the potential liabilities from transboundary

⁵² Treaty of Brussels, 31 January 1963, Trb. 1963, Trb. 1964, 176.

⁵³ See International Legal Materials 25, pages 1370 - 1376, 1986.

⁵⁴ See International Legal Materials 8, pages 497 - 501, 1969.

⁵⁵ See Braams, W.Th., Oevelen, A., van, "Risico-aansprakelijkheid voor milieuschade", Vereniging voor Milieurecht 1991-3, W.E.J. Tjeenk Willink, Zwolle, 1992.

⁵⁶ See Sturm, W.W., "Internationale Ontwikkelingen met betrekking tot aansprakelijkheid voor milieuschade", in: TMA, Environmental Liability Law Review nr. 5, pages 155 - 166, 1992.

⁵⁷ See Spier, J., C.H.W.M. Sterk, "The draft convention on civil liability for damage resulting from activities dangerous to the environment", Tijdschrift voor Milieu & Recht, W.E.J. Tjeenk Willink Zwolle, aflevering 11, November 1992.

environmental impact. An example is the 1989 treaty of Basel that focusses on the transport of hazardous waste. Other recent developments in international environmental rules with regard to environmental liability from transboundary environmental impact are⁵⁸:

- the conventions with respect to liability in the area of nuclear energy;
- the International Convention on civil liability for oil pollution damage, and;
- the draft Convention concerning the carriage of hazardous and noxious substances by sea.

Apparently, a large number of treaties deal with environmental problems. Most treaties focus on a specific medium and a specific pollutant or environmental impact (for example waste and nuclear damage), but recently treaties with a more general focus are being discussed. Treaties provide a very rich source of numerous examples of the fight against transfrontier pollution. In classifying these treaties Colliard⁵⁹ distinguishes three different kinds of schools of thought with regard to authors who suggest approaches to transboundary river pollution. The categorization is also applicable to other media, I list them below:

- Authors who recognize the principle of absolute territorial sovereignty;
- Authors who recognize the principle of absolute territorial integrity, and
- Authors who adopt a half-way system which restricts both⁶⁰.

The principle of absolute territorial sovereignty implies that a State can 'use' freely the environment of its territory (for example rivers, air, etc.). Waste can thus be disposed freely in waters flowing through its territory. This principle therefor stands for the State's right to use the environment for its own benefit.

The second principle states that the riparian State, or more generally the State whose environment is influenced by the activities of other states, cannot use the waters of an international river, or other environmental media, within its territory in a manner which causes damage to other riparians, or influenced States. With regard to the pollution of international waters, the principle of liability was introduced as early as 1956 when the international law Association adopted the following concept: "the pollution of waters by a state, which injuriously affects the user of the waters by another State, renders the State causing or permitting the pollution liable under international law for the damage caused to the state which sustains it".

The third school of authors is characterized by an intermediate system which restricts the other two principles. Colliard describes the theories of this school as theories that are generally based on the concept of neighborly⁶¹. The concept tends towards creating a community of interests of riparian States. This is neither absolute territorial sovereignty nor absolute territorial integrity, but something in-between. The concepts of territorial sovereignty and integrity offer no solution for conflicting interests of upper and lower riparians⁶². The concept of good neighbors reflects the thought that no riparian State is justified in utilizing the waters of a river in a manner which causes "appreciable injury" to another riparian State.

With regard to the extent to which legal commentators and academic works endorse the different three

⁵⁸ See Sturm, W. W., "Internationale Ontwikkelingen met betrekking tot aansprakelijkheid voor milieuschade", in: TMA, Environmental Liability Law Review nr. 5, pages 155 - 166, 1992.

⁵⁹ OECD, Legal Aspects of Transfrontier Pollution, 1977.

⁶⁰ *ibid*, page 264.

⁶¹ *ibid*, page 267.

⁶² This opinion is described by Berber in "Rivers and International Law", page 14, 1959.

principles Colliard concludes "that the weight of legal opinion is in favor of territorial integrity either absolute or in the form of restrictions on sovereignty"⁶³.

To enforce liabilities, international treaties lack any effective powers. One possibility is legal recourse where two options are possible. One option is to settle the claim between the States that are involved. The other option is that the claim is settled between the private parties that are directly involved. Claims are usually to be settled between States when the national government is itself the agent of harm. It seems apparent that in such a case, the State is an involved party. Another argument in favor of dealing on a State level is when the transboundary pollution is of high complexity and large magnitude. For example when there is a large number of polluters with diffuse emissions, lawsuits against individual polluters would not be practical. On an intergovernmental level this could be settled more appropriately.

However, the law literature⁶⁴ gives strong arguments to settle claims between private parties. In that case (international) private law is the legal instrument. Some arguments in favor of this legal instrument are:

1. The negotiation and adjudication of inter-governmental disputes can be a time consuming process.
2. After treaties are converted into national law and as national law has not the disadvantage mentioned under 1, national law is preferable to international negotiations. In the national law the private law makes it possible for private persons (the State can act as a private person) to enforce a compensation.
2. The use of local remedies allows individuals to take the initiative and to launch proceedings on their own without any need to have the claim espoused by their national government.
3. Polluter pays principle. The polluting corporation should pay the possible claims itself and not the government of the State where this corporation is located. A direct suit against this corporation by the injured party seems logically.

Several treaties focus on the environmental impact of specific activities. Some of these are:

- International Treaty of Brussels 1969 (environmental liability related to oil pollution);
- Treaty of Brussels 1963 (environmental liability related to nuclear power plants);
- Treaty of Brussels 1962 (environmental liability related to nuclear ships);

These treaties have in common that they only focus on a specific activity and that to establish the enforcement of liabilities those who operate the mentioned activity are obliged to insure themselves for the liabilities or can establish the certainty that possible liabilities can be paid ('financial responsibility'). On the other hand the treaties can limit the liability⁶⁵. The treaty of Brussels states that the environmental liability resulting from a nuclear accident is limited to about 9.000.000,- Dutch Guilders⁶⁶. Another limitation results from limiting the period for possible requests for a financial compensation for damages. Also a limitation for liability results from excluding certain circumstances under which the damage arose (for example war or natural disasters).

International law is more than only treaties. Especially, with regard to potential compensation due to transboundary pollution other sources of international law should be considered. The role of

⁶³ OECD, Legal Aspects of Transfrontier Pollution, p. 269, 1977.

⁶⁴See for example: OECD, Legal Aspects of Transfrontier Pollution, p. 269, 1977. Weiffenbach, B.M.M.; "Justitia en Mercurius. Materieelrechtelijke tendensen in het internationaal-privaatrechtelijke conflictenrecht bij grensoverschrijdende milieuvervuiling"; in: Environmental Liability law Quarterly; pp. 1-11; February 1989.

⁶⁵ Koeman, N.S.J., W.J. Ouwerkerk, J.M. van Dunne; "Civielrechtelijke aansprakelijkheid voor Milieuschade"; Vereniging voor Milieurecht 1987-4, W.E.J. Tjeenk Willink Zwolle, 1989.

⁶⁶ Treaty of Brussels, 31 January 1963, Trb. 1964, 176.

international law as an instrument for international environmental policy results, next to treaties, from accustomed law and the judgements of International Courts⁶⁷.

Behavior can result in perceived duties and rights of States even in the absence of a formal treaty ("Gewohnheitsrecht"/ accustomed law). Lang (1989) illustrates this with the case of transboundary environmental impact that leads to damage. The State that initiates the environmental impact can honor the request by paying the States that suffered damage compensation. At the same time the paying State declares that, although they pay, the State does not see any legal argument to do so ("payment ex gratia").

Decisions by international courts are another basis for the establishment of liabilities for transboundary environmental impact. The International Courts usually base their judgement on general accepted law principles of the States involved (like elements of Roman law).

3. Product life cycle and environmental liability

The former paragraphs describe different legal sources for liabilities. This paragraph shows how the use of product life cycle analysis in establishing environmental liabilities determines whose behavior is tried to be changed by the liability system. Two different approaches are described. Both are noticed in environmental treaties.

Within the literature on the 'calculation' of environmental impact of products, the total life-cycle analysis is often taken as a starting point. To evaluate the potential liabilities, that can result out of the production of a product, the concept of a total life cycle analysis can be helpful. This concept requests that the environmental impact of a product encloses the environmental impact that results out of the extraction of resources, the production of all the separate parts of the product, the fabrication of the product itself, the consumption/use of the product and the disposal of the product. As liabilities are directly related to environmental impact, the total life cycle analysis gives an overview of stages of the a product in which liabilities can be created and accordingly be prevented. In the legal literature the liability issue is especially addressed at liabilities resulting from the production and transportation (liabilities resulting from damage from emissions of a production process), from the consumption/use of a product ("product haftung"/product liabilities) and the disposal of products. It can be questioned if product liability is still a liability linked to environmental impact. Especially product-liability lawsuits based on workplace exposures is by some authors not considered as an environmental pollution cases⁶⁸. In this paper we follow the approach that due to the narrow linkage between worker safety and environmental care, the liabilities resulting from exposures at the working place are seen as environmental liabilities. The linkage between workplace exposure and environmental impact are illustrated by emissions that damage working force, but also the neighbors of the facility where the workplace is located⁶⁹. In this paper liabilities are defined as compensation to those who

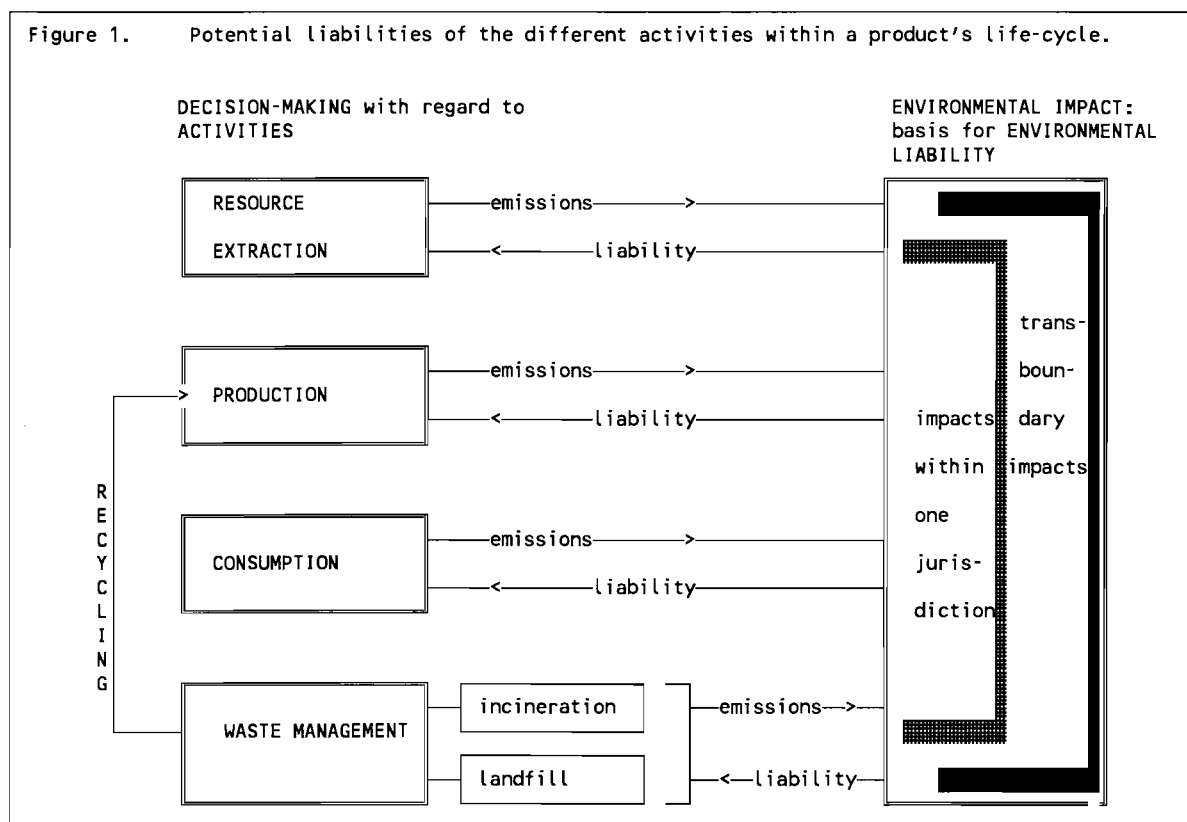
⁶⁷ Lang, W., "Internationaler Umweltschutz: Voelkerrecht und Aussenpolitik zwischen Oekonomie und Oekologie", pp. 151 - 169, Wirtschaftsverlag Dr. Anton Orac, Vienna, 1989.

⁶⁸ For example D., Dewees, in: T.H.; Tietenberg, T.H.(editor); Innovation in environmental policy: Economic and legal Aspects of Recent Developments in Environmental Enforcement and Liability; page 156, Edward Elgar Publishing Limited; England; 1992.

⁶⁹ The linkage between environmental care and worker safety is expressed by using concepts like "Care Systems" . Such management concepts are handled to control emissions both to the workplace and the environment of a organization. Also the chemical corporation DuPont uses a broad term "Safety". As the corporation remarks in a public announcement: "*Das (= Sicherheit, addition author) betrifft die Sicherheit der Mitarbeiter in Forschung, Entwicklung, und Herstellung ebenso wie die Sicherheit aller Menschen im Umfeld der Produktionsanlagen und Transporte und nicht zuletzt die Sicherheit aller, die DuPont Produkte verbrauchen*". See: Frankfurter Allgemeine Magazin, 26. Woche 2. Juli 1993 Heft 696, pp. 38-39.

suffered under a lack of environmental care during all phases of a product life cycle⁷⁰. This definition includes the compensation for damage to the workplace during the production phase of a product. A liability that has been paid by a polluter must not necessarily be used to recover the damage. Governments can collect liabilities and use the revenues to establish a fund. This Fund is allocated to prioritized cases of environmental damage.

Because the ownership of the product differs in the several stages the potential liabilities can be faced by different organizations. Depending on the legal framework the liabilities confront several organizations that fulfill a function in the life cycle of a product. In some cases the liability is channeled to the producer of the product/service⁷¹. This depends on the approach that is taken as a starting point when the legal provisions are made for liabilities. The 'segmented liability approach' results in environmental liabilities for those who owns the activity or material that cause damage in the different stages of a product life cycle. In figure 1 the different stages of a product life-cycle are condensed into four phases, namely: resource extraction, production (primary and recycling), consumption and disposal (incineration and landfill-disposal). The other approach results in environmental liabilities for those who are considered to be the initiator of the environmental impact ('life cycle liability approach').



⁷⁰ The total life-cycle of a product contains all the technical stages of a product: extraction of resources, material production, assemblage of the product, product use and product disposal.

⁷¹ For example in some countries like The Netherlands and Austria the producer of chemical waste is still responsible (and liable) for its waste although it is owned by a hazardous waste facility but that doesn't have the necessary permission. Another case were the liability is channeled to the producer is compensation for damage that result out of the production of nuclear energy. See Treaty of Paris, June 29 1980; Trb. 1981, 175; Protocol, November 16 1982, Trb. 1983, 80.

Segmented liability is the liability that results from ownership at the time that the damage occurred (organizations that face potential liabilities are the deliverer of raw materials, producer, those who store materials and products, consumer/user, disposer and/or the transporters among these organizations). Depending on the vertical integration, different owners face potential environmental liabilities. This approach implies that if for example a material is passed through by a producer to those who store materials and products, the former faces no potential liabilities that are linked to the potential environmental impact of the storage activities. The draft convention on "Civil Liability for Damage resulting from Activities Dangerous to the Environment" has the segmented liability approach as a starting point. In contradiction to this, the draft directive of the EU with regard to environmental liability for damage that results from waste has a 'life cycle liability approach'.

Life cycle liability is an environmental liability that results from the fact that the presence of an activity or material is initiated by the production of products. This presence of an activity or material may occur in other phases of the life cycle and accordingly is owned by different organizations than the initiator. An argument used in favor of this approach is that the initiator has usually more financial securities than the organizations that own the disposal activities. Thereby the probability that the victims will be compensated is increased. Environmental liability is channeled to the producer. However, Sturms (1992) describes two disadvantages of the life cycle liability approach⁷². Firstly, it can be very difficult to trace the initiator of waste. Accordingly, the sources of environmental damage that resulted from the disposal phase can't always be pinpointed. For example the time-span between the moment that a producer transfers waste to a waste manager and the moment that damage occurs from the disposal of this waste, can be very long. Also, it can be technically impossible to know the former generator of waste, because the waste transforms. Secondly, the segmented liability approach makes it possible that the organizations of the separated phases can insure themselves against the potential environmental liabilities of the environmental impacts of their activities. Through the incentive to reduce the premium costs by reducing the risks of environmental damage and through conditions of the insurance companies, the organizations of the different phases of the life cycle are stimulated to change their behavior in order to prevent or minimize environmental impacts. Life cycle liabilities are more difficult to insure, because the different organizations can become liable for the behavior of organizations that they can not influence. The preventive influence of life cycle liabilities are therefore considered to be considerable lower than those of segmented liabilities. Although (potential) liabilities (both segmented and life cycle liabilities) mirror only partly the (potential) environmental impacts, it seems to be an important factor that internalizes external effects. However, internalization through segmented liability is believed to have a higher impact on decision making to decrease environmental impacts than life cycle liabilities have.

The following paragraph focusses on the decision-making behavior of an electricity producing organization that fulfills an important function in the life cycle of many products, e.g. almost all products use electricity. The study reflects how "the environment" is taken into consideration in a strategic decision-making process. There seems to be a lack of empirical research on the influence of environmental liability on decision-making behavior. As Dewees (1992) summarizes: "The deterrent effects of tort liability may appear in various forms: reductions in environmental damage, reduced pollution discharge, reduced activity in polluting industries, or the introduction of environmental factors into decision-making process of organizations". To analyze this relationship, the amount of expenditures by organizations to reduce environmental impact can't be linked with the potential liabilities. Dewees (1992) concludes that: "a boost in spending was in response to the legislation of the early 1970's, followed by a decline as abatement investment outpaced increases in the stringency

⁷²See: Sturms, W. W., "Internationale Ontwikkelingen met betrekking tot aansprakelijkheid voor milieuschade", in: TMA, Environmental Liability Law Review nr. 5, pages 155 - 166, 1992.

of regulation"⁷³ A study in the US, done by the Rand Corporation is more successful in determining the effects of liabilities. Instead of focussing only on the data on the abatement investments, a series of interviews with senior corporate officials from the chemical industry, pharmaceutical industry, the semi-conductor industry, and small firms were conducted. The results of these interviews indicate that environmental liability has had its greatest effect with respect to land contamination by toxic waste, where liability is governed by CERCLA, but no significant effect on decisions pertaining air and water discharges⁷⁴. Although environmental liability seems to have an influence on the outcome of decision-making processes it remains unclear how the process itself is influenced and how the environmental impact actually changes. The shifting of pollutants from the soil medium into the air medium is very well possible. Such a shift of pollutants can be suspected if the results of a survey by the American Chemical Manufacturers Association are taken into account. This survey indicates that between 1981 and 1987, the use of landfills for disposal decreased by 64 percent and incineration use increased⁷⁵.

The following section of this paper addresses the potential ex-ante effect of environmental liabilities. The potential influence of environmental liabilities on decision-making processes for large companies is described.

4. Decision-making behavior

The Commission of the European Union establishes environmental liabilities in order to prevent environmental impacts. The Commission formulated: "Liability will be an essential tool of last resort to punish contamination of the environment. In addition - and in line with the objective of prevention at source - it will provide a very clear economic incentive for management and control of risk, pollution and waste"⁷⁶. In order to establish a substantial ex-ante effect of environmental liabilities, this economic incentive should induce organizations to reduce/control environmental impacts with the outcomes of their strategic decision-making processes. Because strategic decisions determine the environmental impacts of organizations in the long run, it is useful to study how environmental impacts and its economic consequences are taken into consideration in organizational behavior.

Presently, empirical research about decision-making processes and how potential environmental impacts influence the decision-making, is scarce⁷⁷. Although economic literature describes to a great extent, how governmental environmental policy instruments are expected to influence the outcomes of decision making this literature usually only focusses on the influence of one policy-instrument (for example emission taxes)⁷⁸. Decisions are simplified to a trade-off between expected costs of not reacting to the policy instrument (e.g. continuing to cause the environmental impact) and the cost related to the implementation of decisions that reduce that environmental impact. The results of such decisions are based on the assumption of rational behavior that implies profit maximization under

⁷³ See Dewees, D., in: T.H.; Tietenberg, T.H. (editor); Innovation in Environmental Policy: Economic and Legal Aspects of Recent Developments in Environmental Enforcement and Liability; pp. 156 - 157, Edward Elgar Publishing Limited; England; 1992.

⁷⁴ Reuter, P., (1988), "The Economic Consequences of Expanded Corporate Liability: An Exploratory Study", Santa Monica: The Rand Corporation, N-2807-ICJ.

⁷⁵ Environmental Science and Technology, September 1988 (vol.22) page 1003.

⁷⁶ Commission of the European Community, "Towards Sustainability. A European Community Program of Policy and Action in relation to the Environment and Sustainable Development, page 68, COM(92) 23 final-VOL.II.

⁷⁷ One of the few studies that focus on environmental behavior in the Dutch chemical industry is that of J. Schot, et al., "Geven om de Omgeving: milieugedrag van ondernemingen in de chemische industrie", 's Gravenhage, 1991.

⁷⁸ See for example: Siebert, H., "Economics of the Environment: Theory and Policy", Second, Revised and Enlarged Edition, Springer-Verlag Berlin, 1981.

constraints. Constraints are often modelled by assuming a fixed maximum for certain emissions. Wasserman concludes: "Economic theory argues that each source calculates whether it is in its economic calculus to comply or to violate"⁷⁹.

Due to a lack of scientific know-how to express environmental impacts in a general constraint, only parts of environmental impacts (some emissions) are taken into consideration. With regard to the effects of environmental liability, decisions are expected to be condensed to a trade-off between expected liability costs and the costs of preventing the situations that establish environmental liabilities by investing in environmental care.

Environmental Liability influences the cost-benefit analysis and thereby establishes economic arguments to invest in environmental care. Although, environmental liabilities trigger environmental liabilities influence strategic decision-making substantial. Studies indicate that environmental liabilities stimulate activities as 'clean-ups' and risk-management services (environmental audits and environmental management systems)⁸⁰. However, these activities are indications of ex-post effect of liabilities or not strategic in the sense that they determine the future flexibility of the organizations (no substantial allocation of resources). Differences in the liability system may explain differences in the extent pollution prevention is the result of strategic decision-making, but this can be doubted as several motivations for the management of organizations explain the extent of environmental care during a strategic decision-making process. To comply to legislation (permits) is a motivation itself regardless the consequences of not being in compliance. Also reductions in production costs and to establish 'trust' towards the community are strong motivations⁸¹. It is therefore inadequate to link the extent of environmental care at an organization only to one environmental policy category of motivations. Additionally, the role of environmental liabilities in establishing pollution prevention by influencing strategic decision-making has to be reduced due to the following four impediments:

1. Environmental liabilities have a minor role in the first phases (design phases) of strategic decisions that determine the environmental impacts of organizations. Environmental care (the total of measures to control and reduce environmental impact) is less initiated by the motivation to prevent environmental liabilities. It can be suspected that the influence of environmental liability results much more from the evaluation of different potential outcomes of strategic decision making behavior.
2. Participants of strategic decision-making processes are not informed about the potential environmental liabilities of the outcomes of these processes when alternative outcomes are evaluated.
3. The prevention of environmental liabilities is covered by the goal of organizations to be in compliance. "To be in compliance" is then a restriction and not a variable that is determined by a cost-benefit trade-off. In the case of an environmental liability system, that is based on negligence, liabilities can be an incentive to establish the compliance restriction on the outcomes of decision-making process. However, when the liability system is based on strict-liability, the compliance restriction does not prevent an organization from future environmental liabilities.

⁷⁹ Wasserman, H., in: T.H.; Tietenberg, T.H. (editor); Innovation in environmental policy: Economic and legal Aspects of Recent Developments in Environmental Enforcement and Liability; page 23, Edward Elgar Publishing Limited; England; 1992.

⁸⁰ See: Wynne, B., P. Simmons, "Industrial Responses to Developments in Environmental Risk Management", End of Grant Report to the Economic and Social Research Council, Grant W104251001, June 1992.

⁸¹ Compare Zucker, L.G., "Production of Trust: Institutional Sources of Economic Structure, 1840-1920", Research in Organizational Behaviour, Vol.8, pp. 53-111, 1986.

4. The parties that have explicit interests in the outcome of strategic decision-making processes that are directly influenced by environmental liabilities, like insurance companies, may not be involved in the strategic decision-making processes. Insurance companies induce companies to control environmental risks, that may result in environmental liabilities they insured. However, the activities (environmental audits, environmental management systems) that result from these inter-organization control may not influence strategic decision-making processes.

The second impediment applies also to other private costs that result from governmental policy instruments to induce organizations to control and reduce environmental impact⁸². As this impediment is well described by other authors⁸³ I focus on the first, third and fourth impediment. To explore these impediments I refer to behavioral studies from the perspective of organizational theory. My approach does not focus on the economic theory when the effects of environmental policy instruments are studied. The approach is based on concepts of the "behavioral school of compliance". Decision-making behavior may then be explained by a broader array of motivations, such as societal norms, moral values and the less tangible benefits of reducing environmental impacts. Also Wasserman (1992) stresses the importance of the chosen theoretical perspective when he concludes, that the behavior that results in compliance, or more broadly environmental care, can't be easily predicted and is more likely the result of complex motivations, only some of which are rational, reasonable and economically motivated.

For the description and analysis of decision-making the model of Hickson et al. (1989) can be used. This model is based on a large empirical research (the Bradford studies) on strategic decision-making⁸⁴. The model does not rely on the assumption that the outcome of decision-making processes is based solely upon economic motivations. Nor does this model presume a fixed format for the phases of a decision-making process⁸⁵. Instead the model explains differences between decision-making processes. Next to the characteristics of the organization (the parties who have interests in the organization (organizational interests) and formal and informal rules within the organization (organization / 'rules of the game')) characteristics of the object of the decision-making process ('the matter') determine the characteristics of a decision-making process. The two variables are 'complexity' and 'politicality'. **The complexity** of a decision-making process is determined by the frequency that the matter of the process appears within the organization. If the object of a decision-making process is unknown to the participants of the process, they consider the process as more complex than when the 'matter' is familiar to them. Complexity increases by a higher seriousness and the larger the diffusion of consequences of the outcome of the decision-making process. Finally the greater the influence of the decision-making process on future decision-making processes and the amount of parties involved increase the complexity.

The politicality of a decision-making process is the extent that the participants of this process influence the process to achieve an outcome in favor of their own objectives. The participants are the 'decision-set' and are those interest units from among the overall organizational 'coalition' of interests which influence a decision. Three variables determine the extent of politicality: intervention by

⁸² It should be noted that this lack of information is on a micro level. This is different from the lack of information on a macro level that results from high information costs and technical infeasibility for the policy maker to have information about the cost structures of individual firms and households. Compare: Siebert, H., "Economics of the Environment: Theory and Policy", Second, Revised and Enlarged Edition, Springer-Verlag Berlin, 1981.

⁸³ See Romstead, E., O. Bergland, "Inducing Individual Firm Compliance to Emission Quotas When Abatement Costs are Private Knowledge", Paper presented at the Fourth EAERE Conference, Fontainebleau, France, June 30 - July 3, 1993.

⁸⁴ Hickson, D.J.; et al.; "Top Decisions: Strategic Decision-Making in Organizations"; Basil Blackwell Ltd; 1989.

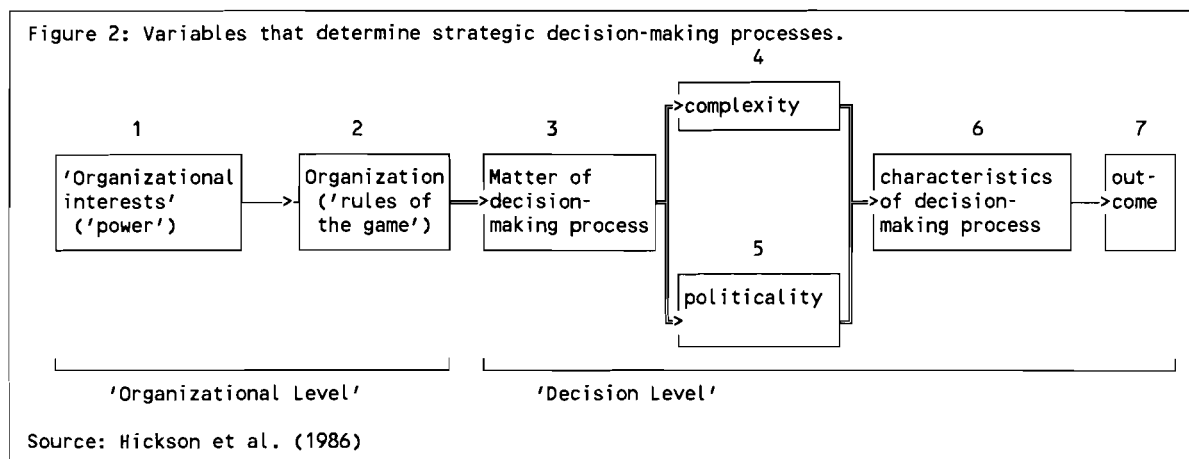
⁸⁵ This in contrast to the presumptions of scientific management where decision-making processes are described by a rigid procedure that starts with a problem definition followed by the identification of alternatives, the selection of alternatives and ends with the implementation of the most beneficial alternative.

external parties (parties who are not a member of the organization), imbalance between the influence of the different participants of the process and contention of objectives. Contention of objectives is especially expected when "environmental care" is linked with a strategic decision-making process and the environmental provisions have (on the short and/or long run) negative economic consequences for the organization. Hickson (1989) concludes with regard to "contention of objectives" that this: "does not necessarily mean outright conflict, for the proverbial 'bone of contention' may be dealt with peaceably enough by compromise or by fiat of higher authority before anything as overt as is implied by the word conflict breaks out. "Contention of objectives" is a propensity for conflict, just as cleavage of interests is a propensity for contention, but whether each occurs depends on how the topic for decision takes shape and is processed⁸⁶".

The five variables of the model of Hickson et al. result in a combination of characteristics of decision-making processes. Some of these characteristics give an impression of the extent and the way in which environmental aspects are taken on board. These 'environmental characteristics' of a strategic decision-making process are:

- the resistance of participants of a strategic decision-making process to some potential outcomes of the process;
- the content and follow-up of different phases of the decision-making process;
- the sources of information that are used during the decision-making process;
- the extent that negotiations take place between the participants of the decision-making process;
- the roles of the different participants of the decision-making process.

Hickson (1989) summarizes the model (see figure 2) by stating that the process derives from organization, problems, and interest.



In appendix A the model of Hickson et al. is used to describe a strategic decision-making process within a Dutch electricity company. The model identifies some of the impediments for environmental liabilities to become effective in pollution prevention. The analysis shows also that environmental impacts are incorporated into decision-making by an array of factors that the model of Hickson et al. identifies. The influence of organizational interests is a major one. However, the model fails to be constructive in giving a framework for describing and explaining the content and sequence of different phases of a decision-making process. Forces are not identified that determine the sequence of phases.

⁸⁶ Hickson, D.J.; et al.; "Top Decisions: Strategic Decision-Making in Organizations"; blz.89; Basil Blackwell Ltd; 1989.

Further modeling is requested to establish a framework that can be handled to determine such forces. Such a model would be beneficial in the identification of the elements of an liability system that result in the consideration of environmental aspects in a strategic decision-making process. It would be worthwhile to know the phases where liability system is effective in bringing environmental concern on board. The framework would not only be helpful to have insight in the effectiveness and efficiency of environmental liability but could also addressed other policy-instruments. If policy-instruments influence mainly the implementation phase of decision-making this would be less efficient and effective than when they influence the design phase. It can be expected that to take environmental aspects into consideration in the design phase would result in greater extent to more source oriented prevention. When a investment is realized and during this phase of implementation environmental-aspects are taken into consideration this could easily result in less efficient and effective 'end-of-pipe'-measures.

5. Conclusions

To explain the level of environmental care within an organization it should be noted that there are a large number of factors that determine the decision-making processes and their outcomes that result in decreases or increases of environmental impacts.

Environmental liabilities may have some influence on these decision-making processes, although this paper shows that there are some impediments for the establishment of this ex ante effect. However, the ex post effect of environmental liabilities provide compensation for those persons who suffer environmental damage. Additionally, in some countries, there is a possibility that environmental pressure groups, who are not personally injured, make polluters liable and force them to restore the environment. The ex post effect demonstrates how property rights are established that prevent the environment from being a production factor without any price.

APPENDIX A: A strategic decision-making process within a Dutch electricity company

This appendix describes some results of a case study on a strategic decision-making processes within the Dutch electricity sector. It is described how environmental aspects are taken into consideration in a decision-making process that proceeded the implementation of an installation that highly influenced the amount of transboundary emissions of Nox.

The case study is based on fifteen interviews with participants of the decision-making process, internal documents (reports of meetings, studies conducted by staff departments) and publications (reports for external use: national electricity plans and environmental reports).

Electricity production in The Netherlands is divided into four regions. The electricity company Beta⁸⁷ is one of the four Dutch companies that produce electricity. The four electricity companies collaborate within an organization ("Collaborating Electricity Companies", SEP) that represents the common interests of the companies. Some of the main tasks of the SEP are:

- planning of changes in production capacity;
- decision-making with regard to investments in the production capacity;
- optimization of the production of electricity;
- determining the price of electricity in order to cover the production costs;
- 'buying' of the produced electricity from the electricity companies and selling the electricity to the Dutch distribution companies or exporting electricity;
- importing electricity;
- buying of fuels for the electricity companies.

The electricity companies used to have a monopolistic position that deliver their electricity to the SEP at a price that is based on a fixed national tariff and adjustments for location specific costs. The monopolistic position is decreasing due to the option of larger electricity users to generate electricity themselves and the future possibility for electricity users to buy electricity from foreign electricity companies. Electricity company Beta has 29 % of the total production capacity of the four Dutch companies together. The capacity of Beta is delivered through 9 production locations. There are +/- 1.300 persons employed at Beta.

In addition to the social benefits of the production of electricity and offering employment within the electricity sector and industries that deliver goods and services to this sector, Beta faces environmental impacts of its activities. Further, the activities of industries that deliver goods and services to company Beta and the consumption of electricity, cause in environmental impacts (total life-cycle approach). The environmental impact of electricity production include:

- emissions to air (SO₂, Nox, CO₂, dust);
- emissions to water (waste water, cooling-water);
- solid waste (ashes, chalk, chlorides);
- risks (explosions);
- noise.

The primary processes at Beta are the production of electricity by incinerating coal, gas and sometimes oil. By describing the decision-making processes that result in adjustments or expansions of these processes, insight can be gained about the motivations that result in environmental care that is linked with these decisions. Also, the participants who influence the decision-making processes with

⁸⁷ In order to keep the electricity company unknown the fictitious name 'Beta' is used.

the perspective to reduce environmental impacts are noticed.

The decision-making process studied at Beta is a modification to reduce Nox emissions at one of the facilities (The DeNOx-project). An analysis was performed of the decision-making process, using Hickson's 7 elements model.

When the characteristics of the decision-making process (element 6) are described the influence of the organizational interests are revealed. **Organizational interests** (element 1) are established at least by six major groups (stakeholders). First, the SEP that represents the common interests of all electricity producing companies. Second, the Government (Ministry of Economic Affairs, Ministry of Environmental Affairs, Provinces and local governments). Third, the Financers. Beta finances its activities by borrowing money from the capital market. Fourth, the electricity distributors who are also stockholders of Beta. Fifth, the society which refers to neighbors of production plants and non-governmental organizations like environmental pressure groups. Finally, others, who have economic interests in Beta. For example, insurance companies and industries that deliver goods or services to Beta.

In addition to the organizational interests the **formal and informal 'rules'** of the organization influence the decision-making processes (element 2). With regard to the rules that apply for decision-making processes that precede investments within Beta, the role of the SEP is important. As described above, one of the tasks of the SEP is decision-making with regard to investments within the four electricity companies. All activities of SEP are controlled by a Board of commissioners. Half of the board consists of the management of the four electricity companies. The other half consists of other stakeholders, namely: representatives of the Ministry of Economic Affairs, Provinces and local governments. Therefore, control is exercised by different stakeholders. Element 6 of the model reflects the influence of the SEP in characteristics of the decision-making process. Other organizational aspects of Beta that influence the decision-making process result from the procedure that a project-organization has to be set when specific problems has to be dealt with. Also with regard to the DeNOx-installation there was a project team that consisted of the director of the technical development department (chairman), functionaries of the departments, 'New Building', 'Environmental Affairs', 'Technical and Financial Planning'. The departments 'New Building' and Environmental Affairs are in line authority below the director of the department of the Technical Development'. The director for financial and economic affairs is responsible for the department of 'Technical and Financial Planning'. Another factor that affects the decision-making process results from direct regulation. The Energy Act describes a procedure that demands from the four electricity companies, the SEP, distribution companies, and representatives of provinces, local governments and the Ministry of Economic Affairs are to formulate an "Energy plan", every two years. This plan must describe the expected electricity demand and the necessary production-processes to supply this demand. The procedure also determines how the options to produce the electricity were generated, evaluated and selected. The procedure for the consultation between the electricity companies and the SEP is detailed in the Energy Act. Apart from conditions, like the expected electricity demand, this procedure details the consultation structure between the SEP and the electricity companies that is also followed for larger investment decisions. This applies to the DeNOx-project. Finally, Beta is developing an environmental care system⁸⁸ that provides organizational and administrative elements for decision-making pertaining to environmental impacts. At the time of the DeNOx-project, Beta had only one organizational element that could be considered to be part of an environmental care system.

⁸⁸ Companies with large environmental impact are, in The Netherlands, expected to have implemented an environmental care system by the end of 1995. This is a management tool that provides in technical, organizational and administrative elements in order to get insight into the amount of environmental impacts, to control and if feasible to reduce these impacts. See: Tweede Kamer, Notitie Milieuzorg, vergaderjaar 1988-1989, 20 633.

This element is the department, "environmental affairs", that participated in the decision-making process. The decision-making process for the DeNOx project, resulted in some extensions of the environmental care system. The emission registration and external reports to inform the government about emissions (NOx and SO2 emissions) were further developed.

The third element of the model is **the matter (problem) that is dealt with by the decision-making process**. The decision-making process selected for study pertains to the modification of the production-process to reduce NOx emissions.

The large frequency of decision-making processes that focus on the production-processes and its emissions (reduces complexity), highly serious and the diverse consequences for example those that are linked with increases in electricity prices (increases complexity) and moderate consequences for future decision-making (the implementation of the DeNOx-installation doesn't evoke new strategic investments) results in an average moderate **complexity** of the decision-making process (element 4). This is reflected in the process by a large number of different participants that are involved in the decision-making process. The **politicality** of the decision-making process is also high (element 5). The different participants influence the decision-making process to achieve an outcome in favor of their own objectives. External parties, like the Ministry of Housing, Town and Country Planning and Environmental Affairs (Ministry of VROM) and the SEP are directly involved in the decision-making process. The Ministry of VROM formulated, together with the coordinating organization of the provinces and the SEP, the objective to reduce NOx emissions (initiative phase). Due to the consultative structure with the SEP, this organization was intensively involved during all the phases of the decision-making process. The objective of the Ministry of VROM is to reduce environmental impacts of the electricity sector. The objective of the SEP is to deliver electricity at a minimum price and in a socially acceptable manner, conform to the objectives of the four electricity companies. Consequently, there is a contention of objectives. Reducing the NOx-emissions results in higher production costs. The objective to offer electricity at a minimum price is thereby negatively influenced. The extent of imbalance between the influence of the different participants of the decision-making process is unclear. It is noticed that the objective with regard to NOx emissions is negotiated. For the whole Dutch electricity sector, the emissions are fixed at the total emission NOx of 30 million kg NOx per year after the year 2000. The present emissions are considerably higher. The outcome of this negotiation resulted in a gentleman's agreement ('Convenant') in which the SEP promised to achieve the necessary NOx reductions in a given time-frame. This 'convenant' included obligations for the electricity company with regard to SO2 reductions and the development of an "environmental care system". The DeNOx-project resulted from the obligation to reduce NOx.

With regard to the characteristics of the decision-making process (element 6), the diversity of parties that participated in the decision-making process is described. In line with Hickson (1989) it is noticed that committees appear to be the means of coping with multiple interests of different parties that are a member of Beta and external parties such as public interests represented by departments of governments. Other characteristics of the decision-making process are the sequence and content of the different phases of the decision-making process, the use of information and the economic methods that are used to select the options to reduce NOx-emissions. These characteristics are focussed on and the impediments for the establishment of the ex-ante effect of environmental liabilities are highlighted.

The decision-making process can be divided into five phases.

1. **Initiation phase**. In 1991 the SEP requests from the four electricity companies (including Beta) to generate options that reduce NOx emissions. A project team at Beta formulates a plan that describes the technical options to reduce NOx. The project team made the following categorization with regard to the production locations where technical options could be implemented:

- I. Production locations that will cease production before 1-1-1993. No options are generated for these locations.
- II. Production locations that will cease production between 1-1-1993 and 1-1-1996. No options are generated for these locations because the investments can't be depreciated.
- III. Production locations that will cease production between 1-1-1996 and 1-1-2000. Technical options are generated. At least three aspects were taken into consideration:
 - emission permits that are necessary due to environmental legislation are to be provided by the provinces (regional government). Consequently, other environmental effects of the option were evaluated;
 - focus was on the locations with larger NO_x-emissions;
 - only secondary technologies (= 'end-of-pipe') were generated. Because the production processes of the production locations are already operating, the change to other production processes (primary technologies) was not economically feasible.
- IV. Production locations that will operate after 1-1-2000. Both primary and secondary technologies were considered. Beta does not develop the technologies itself, but is a 'technology user'.
- V. Production-installations that are planned but not yet built. The provisions that are planned in order to reduce NO_x-emissions are re-evaluated. Because these production installations are not yet built, changes may be very cost-effective (no extra depreciation costs that result from stopping the production process before its technical and economic life duration).

The initiation phase ended with a list of technical options at the production locations that belong to Beta and comparable lists from the other three electricity companies. For all the options, the costs were calculated with a confidence of 15%.

2. The First selection phase. The SEP, in consultation with the four electricity companies, identified the options that had to be elaborated. A steering committee was formed that consisted of the SEP and representatives of the four electricity companies. The chairman of the project group to reduce NO_x at Beta was the representative of Beta. Since primary technologies are most cost-effective (reduction at the source) these options were chosen. Because of the high reduction goal of NO_x, secondary technologies had also to be chosen. Those that were most cost-effective were selected. The DeNO_x-project is one of the options that was identified for a production location of Beta and belongs to the category of secondary technologies. To make a definite selection (phase three), plans to realize the options, were elaborated in order to have more specific cost and technical information.

3. Final selection phase. In order to reduce NO_x at minimal costs and to minimize the electricity price, eight criteria were used:

- investment;
- the time-frame that the production installation operates;
- operating costs (personnel, material costs, maintenance costs, etc.);
- effects of the option on energy efficiency;
- effects of the option on the minimum and maximum production capacity;
- possible constraints for the primary production process;
- changes in NO_x-emissions;
- the total expected costs per reduced ton of NO_x.

Based on these criteria, the steering committee chose the most cost-effective options to achieve the total No_x-emission reductions for the Dutch electricity producing sector. For the calculation of the most cost effective options, the following assumptions were made:

- time of evaluation: 1990-2015;
- the operating durations of the production locations based upon the Energy-plan;
- the present Nox-emissions;
- investments, operating costs and Nox-reductions to be achieved by the four electricity producing companies;
- an interest percentage of 8%, inflation of 4% per year.
- cost-effectiveness is calculated for the total expected life duration of the investments.

4. Formulation and acceptance of the strategy to fulfil the gentleman's agreement. As described above, the DeNOx-project is part of other activities of Beta to fulfil the obligations of the gentleman's agreement that resulted from negotiation between the SEP, the Ministry of VROM and the coordinating organization of the provinces (IPO). This resulted in an obligation to formulate a strategy that described all the options to realize the necessary NOx and SO2 reductions, a time-schedule, and the promise to develop an environmental care system to provide insight in and report on the emissions of NOx and SO2. This strategy had to be accepted by a committee that consisted of 6 members: 2 representatives of the Ministry of VROM, 2 representatives of the IPO and 2 representatives of the SEP. SEP formulated this strategy in consultation with the four electricity companies and was accepted by the committee.

5. Implementation of the DeNOx-project. After acceptance of the strategy to fulfil the obligations of the gentleman's agreement, Beta made a contract with SEP that guaranteed Beta an electricity price that was adjusted for the costs related to the investment in the DeNOx-installation. The provinces supplied Beta with the necessary permits to build and to use the DeNOx-installation. The supply of the necessary permits was linked to an evaluation of several environmental factors. These environmental factors are those that are mentioned in environmental regulations such as the nuisance act and environmental acts pertaining to emissions to the air and water. These acts prescribe the necessity of permits. To obtain the permits, Beta had to change the Denox-project with regard to the use of ammonia, that resulted in an increase of operating costs by 50% (from 600.000 Dutch guilders to 900.000 Dutch guilders per year).

Although the investment linked with the DeNOx-project is financed by money from the capital market, there is no influence of financiers on the decision-making process. Due to the monopolistic position of Beta, all capital costs are covered by the electricity price.

With regard to the impediments of the establishment of the ex ante effect of environmental liabilities it can be concluded, that environmental liabilities are not influencing the decision-making process of the DeNOx-project. Other (environmental) factors are clearly influencing the decision-making process and its outcome. The NOx-emissions, that are reduced by the DeNOx-project, result in transboundary environmental impacts. Beta did not 'calculate' any potential damage that may result from these NOx-emissions (a classical example of an external effect and thereby not internalized in corporate decision-making). The incentive to reduce NOx by the DeNOx-project came from a gentleman agreement and is therefore not only an external influence. The SEP negotiated the reduction objective for NOx and initiated, thereby, the decision-making process of the DeNOx-project. The environmental goals of the national government, that has the duty to protect the environment, resulted in negotiations with the electricity sector. Other environmental factors that influenced the decision-making process are the interests groups with environmental objectives (like the Ministry of VROM, provinces and the regional government) and environmental regulation (by its system of emission-permits) resulted in evaluation of environmental aspects of the DeNOx-project (emissions to air and water and nuisance). To be in compliance, is an overall organizational objective and is not a result of a cost-benefit analysis. The monopolistic position is a possible explanation for this situation. Potential liabilities, that are costs of not being in compliance, are therefor not considered. Although, environmental liabilities

are based on negligence in the Netherlands, some environmental liabilities result from a liability system with a strict liability (for example environmental liabilities linked with solid waste). Environmental liabilities are therefore, not per definition, prevented by being in compliance.

The evaluation of the alternatives to the DeNOx-project is based on a cost effectiveness analysis. Potential liabilities are not mentioned. Also, hidden costs (primarily administrative and labor costs) are not specified. Only the more direct (tangible costs) are specified. Insurance companies that insure against potential liabilities (including some environmental liabilities) are not participants in the decision-making process. The link between the premium costs and the level of environmental care is not noticed by the participants of the decision-making process.

Although, the decision-making process of the DeNOx-project, highly influences the environmental impacts of Beta, it can not be concluded that environmental liabilities have no influence on this organization. In this paper, environmental liabilities are defined as compensation to those who suffer from a lack of environmental care during all phases of a product life cycle and penalties linked to that impact. By the analysis of only one decision-making process, a generalization for the whole company, is not possible. However, the goal of such an analysis is to identify impediments for the establishment of the ex ante effect of environmental liabilities. The analysis shows that environmental impacts were incorporated into the decision-making processes by an array of other factors. Some of these factors were directly a result of a cost-benefit analysis. The influence of interest groups of an organization is another factor.

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