"What you risk reveals what you value", and Other Dilemmas Entountered in the Legal Assaults on Risks

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CHAPTER 5

"What you risk reveals what you value", and
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Introduction

This chapter analyses the impact of the precautionary principle on the issue of the balancing of interests between on the one hand the prevention of environmental risks and the socio-economic interests related to activities that generate such risks on the other.

At face value this impact is a radical one. In several treaties, the precautionary principle is formulated in absolutist terms. It stipulates that once a risk of a certain magnitude is identified, preventive measures to eradicate that risk are mandatory.

There are strong policy-arguments for this absolutism. Too often environmental interests have been the victim of under-estimation of risks. At the same time, there is little doubt that, as a matter of policy, the absolutist objective of the precautionary principle should not be pursued blindly and unconditionally. At times, risks that threaten environmental interests may be a price worth paying to serve other environmental or societal interests.

Now that the precautionary principle has become accepted as an international legal principle, and states face the obligation to implement it, the question

1. See infra p. 74.
2. See infra p. 77.

The absolutist precept of the precautionary principle

All environmental law reflects an intricate balance between the beneficial effects of industrial, agricultural, municipal and other activities on the one hand, and the environmental risks of such activities on the other. Many feel that often this balance has been insensitive to environmental interests. Too often, so it is thought, activities having potentially detrimental environmental effects have been allowed to proceed, only because such effects had not yet been proven.

An analysis of this question proceeds in three main parts. First the absolutist aims of the precautionary principle will be discussed. Secondly, the main policy considerations calling for mitigation of absolutism will be summarized. The conclusion will be that absolutism as a policy-objective is undesirable. The remainder of this chapter contains an analysis of these considerations are reflected in law and discusses legal restrictions on the absolutism of the precautionary principle. The main thrust of the analysis is that, first, notwithstanding the absolutist formulation of the precautionary principle, recent treaties allow for a non-absolutist construction of the principle and that, second, this is a mixed blessing; while to some extent such a non-absolutist construction adequately allows for other environmental and societal objectives, in some cases the balancing that is permitted by treaties may undesirably undermine the objective of precaution.

The analysis focuses primarily on the precautionary principle in international law. The increasing number of treaties incorporating this principle, transforming it from a policy objective into a legal principle, makes the international legal implications a timely and imperative subject of analysis. However, the analysis will draw substantially on experiences with precautionary legislation in national law, in particular that of the United States. Facing comparable challenges, in many respects national and international environmental law have developed along similar lines. Patterns developed in national law often foreshadow those that will evolve in international environmental law.

A case in point was the unwarranted, misconceived and eventually floundering efforts in national and international law to prevent inputs of toxic pollutants into surface waters. These efforts were characterized by a quest for a positive finding, with a sufficient measure of certainty, that particular substances were hazardous. The absence of information necessary to perform adequate risk-assessments and the resulting uncertainty have caused prolonged regulatory inaction and continued exposure of the environment to hazardous substances. This may not in all cases have been the result of a deliberate balancing of interests unfavourable to risk-prevention. But the result definitely was one in which prevention of risks was accorded too little weight as compared to the costs of control measures and the benefits of the risk-generating activities.

Also when effects were known but had not yet materialized, at times the balancing of interests has been insensitive to the protection of the environment. Damsing of rivers in the United States was known to ruin salmon fisheries, but as these effects remained invisible for long periods of time, and as new power and water were considered worth the price, damming continued.

Disatisfaction with such disturbing outcomes of balancing has triggered the rise of the precautionary principle. It aspires to achieve a radical break-through in the dominant and ineffectual pattern of balancing of risks, costs of regulatory measures and benefits of activities that cause risks. Two features of the precautionary principle are essential to this aim.

First, whenever certain risks are established prevention is mandatory, even when no cause-effect relationship between an activity and its environmental effects has been established. Under all treaties incorporating the precautionary principle, preventive measures are mandatory once a "likelihood of" or a "reasonable concern for" harm exists, or a similar threshold is crossed. Scientific
uncertainty is no longer a valid legal ground to postpone prevention. By doing so, treaties follow the example of United States environmental law. In applying precautionary legislation, courts have held that certain environmental or health risks justify the abatement of hazards, despite the absence of evidence of actual harm. To be sure, formally this feature always was present in international environmental law. Many older treaties contain obligations to take preventive measures when environmental harm is likely to be caused, rather than when it is certain that harm will be caused. However, actual practice, characterized by post-hoc rather than preventive approaches, has made such obligations largely symbolic and virtually stripped them of any legal normativity. The support for the precautionary principle signals a commitment of states to take seriously and to re-activate such pre-existing obligations.

Second, in most treaties the precautionary principle is cost-oblivious. Costs or technological (in-)feasibility of control measures cannot be invoked to eschew the obligation to prevent risks. As soon as risk-thresholds are crossed, the activities concerned should not be undertaken, whatever devastating impacts a decision to that effect may have on profits of agricultural or industrial activities. This absolutist feature also finds a solid basis in treaty-law. Preventive measures are mandatory once a “likelihood of” or a “reasonable concern for” harm exists, or any similar threshold is crossed. Costs are not to be taken into consideration. In this respect too, international law follows United States environmental law;

8. See the treaties referred to in n. 3.
9. Ethyl Corp. v. EPA, 541 F.2d 1 (D.C. Cir. 1976) (en banc) (upholding an EPA regulation requiring reductions in lead additives in gasoline, despite a lack of proof of danger); see also Reserve Mining Co. v. EPA, 514 F.2d 492 (8th Cir. 1975) (en banc) (noting that although it cannot be said that the probability of harm is more likely than not, the risks caused by the public’s exposure to asbestos fibres justified precautionary measures to protect the public health).
14. For instance, under §182(a) of the Atomic Energy Act, 42 U.S.C. §2232(a) the Nuclear Regulatory Commission has to ensure that any use or production of nuclear materials “provid[es] adequate protection to the health or safety of the public”. This standard prohibits the Commission to consider the economic costs of safety measures; see Union of Concerned Scientists v. US NRC, 824 F.2d 108 (D.C. Cir. 1987).
16. Of course, this is different for risks that where unknown: the terminological debate whether such uncertainties are actually risks will not be pursued here.
17. Public Citizen v. Young, 831 F.2d, 1108, 1117 (D.C. Cir. 1987), quoting Congressman Delaney who noted that “Some food additives serve a useful purpose. However, color additives provide no nutrient value .... They have no value at all, except so-called eye appeal”.
19. Cross, op. cit., n. 13, p. 73.
risks accompanying societal, rather than strictly personal, benefits is only gradual. Medical X-rays probably would pass the threshold of "likely harm", but we are willing to accept that risk because societal benefits outweigh it. Asbestos entails a considerable risk to human health. Yet, radically phasing out asbestos may not necessarily improve human health if the use of asbestos in car brakes were also to be prohibited. As alternative materials in brakes are arguably not as effective, prohibiting asbestos could increase highway fatalities. A sound policy on asbestos should involve a careful balance of the health risks of asbestos against the risks of motoring fatalities.

In particular cases balance other than absolutism may be warranted to safeguard the social and economic benefits of risk-generating activities. In a case where the public’s exposure to asbestos fibres in air and water created health risks that justified abatement of the hazards as a precautionary measure to protect public health, the socio-economic effects were accorded critical weight in fashioning relief. As noted by one commentator, rightly so: a shutdown of the factory in question may have erased all risks of exposures but would also have imposed enormous costs on the company employees, their communities, and the economy of the whole region. One can extend this argument by invoking the "risk is safer" proposition. Adverse economic effects may have detrimental health effects, and an assault on risks that falls to consider these effects may turn out to be partly self-defeating.

Finally, absolutism may need to be mitigated since it is impossible to phase out all risks simultaneously. If the mere identification of a risk beyond threshold levels would mandate regulatory action (as required by an absolutist interpretation of the precautionary principle), strict implementation of the precautionary principle would pre-suppose virtually infinite resources. For instance, subjecting a risky industrial process to the requirement of best available technology may require such rigorous controls, consuming such large amounts of resources, that the number of substances or activities that can be regulated is seriously limited. This is particularly undesirable as the initial selection of the substance or activity to be regulated is often quite arbitrary. In the international context, the expenditure of national administrations in implementing the precautionary principle under the 1992 Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention) by addressing some industrial sectors means that resources cannot be spent on other sectors. Equally significantly, they cannot be spent to implement preventive policies under treaties dealing with other environmental threats such as transboundary air-pollution or the emissions of greenhouse gasses. Given the scarcity of resources, priorities have to be set. Some risks have to be accepted in order to erase others.

This, there are good policy considerations for mitigating the absolutist aims of the precautionary principle. Whether or not certain risks need to be phased out or to be accepted in order to serve other values obviously depends on a case-by-case analysis; the point is that it can not be presumed that all risks need to be phased out once a threshold is crossed. The key question is to what extent international law serves the twofold objective of furthering precautionary, risk-aversion policies on the one hand, and reflecting the policy considerations calling for mitigation on the other. This question is assessed in the remainder of this chapter.

The precautionary principle as a principle

A first element in a non-absolutist construction of the precautionary principle follows from the role that has been accorded to the principle in recent treaties. An absolutist precautionary policy would pursue the objective of precaution by imposing a strict obligation to prevent activities once a certain risk has been established. Such absolutism characterizes for instance the Clean Air Act, that contains unequivocal obligations to prevent an activity once a health or environmental risk is established. Most environmental treaties do not take such an absolutist approach. Rather, they include a principle embodying the objective of precaution. The 1992 Convention on the Protection and Use of Transboundary Watercourses and Interstate.
national Lakes (Transboundary Watercourses Convention) unequivocally says that precaution is not an absolute obligation. Its parties “shall be guided” by the precautionary principle in taking all appropriate measures to prevent transboundary water pollution. 28 Comparably, the 1992 United Nations Framework Convention on Climate Change (Climate Change Convention), using somewhat confusing wording, stipulates that parties shall be guided by the principle that they should take precautionary measures. 29 Other treaties appear more set to support the absolutist aims of the precautionary principle. The 1992 OSPAR Convention and the 1992 Convention for the Protection of the Marine Environment of the Baltic Sea Area (Baltic Sea Convention) obligate parties to apply (rather than be guided by) the principle. 30 However, the different wording does not necessarily create different legal consequences; decisive is that in these treaties too the precautionary principle is a principle.

The fact that treaties have formulated the imperative of precaution in terms of a principle certainly supports risk-aversion policies. It directs the development of more specific obligations. Ideally, international environmental law should be a principled system of rules, with specific obligations being based on and consistent with underlying principles. The impact of the precautionary principle is to reject some obligations (such as those exclusively relying on quality standards) 31 and support others (such as those forcing clean technology 32 or reversing the burden of proof in relation to the risks posed by substances or activities). 33 However, this brings us only so far. The fact that the precautionary principle is a principle also means that it does not set forth absolute obligations. Principles serve as guidelines, rather than imposing concrete obligations. 34 The precautionary principle states reasons that argue in the direction of precaution, yet do not necessitate one particular decision that would guarantee total prevention. 35 Where appropriate, other principles and legal considerations can be taken into account and result in an outcome other than which could be achieved by the isolated application of the precautionary principle. In this respect, the precautionary principle does not differ from other currently fashionable principles, such as the polluter-pays principle. Many think that the costs of pollution should be born by polluters. Yet, there is no doubt that the polluter-pays principle cannot and should not be applied in absolute terms, regardless of its environmental and economic consequences. 36 The same holds for the precautionary principle. The status of the precautionary principle as a principle allows for a balanced approach to risks. It serves the interest of risk-aversion; yet it means that the precautionary principle is not a trump-card that a priori overrides other considerations.

Balancing and threshold levels

A second mitigation of the absolutism of the precautionary principle follows from the threshold levels set forth in the definition of the principle. Before the precautionary principle requires preventive action, a threshold finding must be made with regard to the harmful potential of an activity. Treaties employ different terminology to define these thresholds: preventive action is mandatory when there are “reasonable grounds for concern that pollution may be caused”, 39 when pollution “is likely to cause” significant adverse transboundary effects, 40 when there are “threats of serious or irreversible damage” 41 or when harm to humans or to the environment may be caused. 42 The differences in wording are confusing, but for practical purposes are unlikely to create differences in law. 43

These threshold levels are of decisive significance in relation to the degree to which balancing is permitted in the implementation of the precautionary principle.

30. Respectively Art. 2(2)(a) and Art. 3(2).
31. Sonja Boehmer-Christiansen, “Environmental Quality Objectives Versus Uniform Emission Standards”, in Freestone and Uffla, op. cit., n. 15, pp. 139-149. Note that quality standards as such can play an important part in implementing the precautionary principle (see p. 81 ff.); the point is that the uncertainties involved in setting quality standards makes exclusive reliance on quality standards inconsistent with the precautionary principle.
Whenever threshold levels are crossed, the precautionary principle retains its absolutist face, subject to considerations set forth above and in the remainder of this chapter. However, in two respects (concerning the indeterminacy of the threshold and cases where threshold levels are not crossed) the use of thresholds detracts from the absolutist nature of the principle. Both mitigations go beyond what is desirable to serve the policy-considerations set forth above and threaten the objective of precautionary policies. Below some suggestions are given for ameliorating this danger.

**Balancing in the threshold determination**

First, absolutism is mitigated because of the flexibility of the terms "reasonable ground" and "likely to cause" and the resulting discretion they leave to states. It is important to note that in principle the threshold determination excludes consideration of costs. For instance, states are not allowed to consider the costs of regulation in determining whether transboundary water pollution "is likely to cause" significant adverse transboundary effects and thus crosses the threshold of the precautionary principle under the 1992 Transboundary Watercourses Convention. An illustration is the case of Natural Resources Defense Council v. U.S. E.P.A. Under the Clean Air Act, the EPA had to set emission standards for toxic air pollutants to protect the public health and base these exclusively on risks to health. When the EPA considered a prohibition of all emissions of vinyl chloride undesirable in view of, inter alia, the number of employees that would at least temporarily be unemployed, it based emission standards for vinyl chloride on the feasibility of the technology. The District Court of Columbia rejected this approach and held that the EPA had "in the face of uncertainty about risks in health, substituted technological feasibility for health as the primary consideration." However, in international law a similar conclusion will apply.

However, although there is no doubt that this is the correct legal conclusion, the discretion left by the threshold is so great that as a practical matter it may be difficult to assess whether a state's determination that a threshold is or is not crossed is a purely scientific affair or involves some consideration of costs. It is this discretion that may undermine the objective of precaution. Further specification of threshold-levels is critical. This can reduce states' discretion and thereby prevent (hidden) balancing. An example is the aim of the United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks to operationalise the precautionary principle by establishing "precautionary management reference points". These should specify when certain stocks are reduced to levels that put their conservation at risk. Approaching or exceeding these reference points triggers management measures. Theoretically, for prevention of pollution-risks similar specification of thresholds can be achieved by formulating quality standards. In national law water quality standards establish base lines for acceptable (risks of) pollution. Although practical problems in their development and enforcement are ubiquitous, potentially quality standards can take away much of the discretion in implementing the precautionary principle.

**Balancing below threshold levels**

A second mitigation of absolutism is that the precautionary principle leaves room for balancing below its threshold. If existing evidence is inadequate to enable a threshold finding, and no more specific rules apply, risks not reaching the threshold of "significant", "likely" or "reasonable concern" can be balanced freely with benefits of such activities and the environment may continue to be exposed to risks. The interests benefiting from the regulatory status quo prevail.

This too is a feature that may seriously impede precautionary policies. While it is undesirable to mandate total prevention for any risk of whatever magnitude, the most worrying aspect of the way in which the precautionary principle is presently formulated in treaties is that it does not at all address (speculative) risks of environmental effects not known to reach threshold levels. The precautionary principle is intended to improve the way the law deals with uncertainties. Yet, as currently formulated it deals only with risks known to be of a high enough

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42. 824 F.2d 1145 (D.C. Cir. 1987).
46. Revised Negotiating Text, ACONF/164/13/Rev.1 of March 30, 1994, par. 4(d).
47. Ibid.
49. Under the Clean Water Act, the finding that quality standards are crossed triggers the obligations to include extra stringent limits in permits: §301(b)(1)(C), 33 U.S.C. §1311(b)(1)(C).
50. Art. 1(1) to the 1991 Protocol to the 1976 Rhine Chlorides Convention, Brussels, September 25, 1991, Tractatenblad (Treaty series of the Kingdom of the Netherlands) 1992, 3 (setting a quality standard for the presence of chlorides in the Rhine); Art. 3(3) and Art. 9(2)(e) of the 1992 Baltic Sea Convention (obliging parties to define, where appropriate, water quality standards for the purpose of preventing, controlling and reducing transboundary impacts).
51. Latin, op. cit., n. 5, pp. 92-93. Compare the dissenting opinion of Marshall in Industrial Union Dep't v. American Petr. Inst., 448 U.S. 607, 714 (noting that if the Secretary would have to wait with regulating until the threshold of "significance" was reached (as demanded by the majority opinion), "American workers would be subjected for the indefinite future to a possible substantial risk of benzene-induced leukemia and other illnesses").
magnitude, and not with uncertainties. In itself, it does little to protect the environment against the unknown.

It would be in line with the literal meaning of precautionary action, but go beyond the precautionary principle as currently formulated in treaties, not to confine precautionary action to cases where risks are well-established. Uncertainty should be a "regulatory fact that impels action." As a general proposition, the imperative should be to enhance caution when information is poor and when potential environmental costs of delay are large. This does not mean that any risk requires a prohibition of the activity concerned. There can be a range of responses (short of a prohibition) suited to the range of potential factual findings that are not threshold-findings. These include a reversal of the burden of proof, as discussed below.

Allocation of the burden of proof

A third factor detracting from the absolutism of the precautionary principle is the prevailing allocation of the burden of proof of establishing whether threshold levels are reached. In cases of high uncertainty, the allocation of the burden of proof is critical for determining whether risk-generating activities are permitted to proceed. As noted by Rodgers, "In a world of uncertainty, the burden of proof and persuasion reign supreme." An absolute construction of the precautionary principle would be served by allocating the burden of proof to those proposing to undertake risk-generating activities. They would have to prove that the threshold is not crossed. In case of high uncertainty they will not meet this burden and the activity is not to proceed, and environmental interests prevail.

However, this is not the prevailing allocation of the burden of proof. Characteristically under environmental treaties the burden of proving risk is allocated to those questioning whether a risk-generating activity should proceed. If there is high uncertainty and no likelihood of harm can be established (thus: the threshold is not known to be crossed), activities may proceed. That this allocation can have unsatisfactory outcomes was illustrated in a case concerning unknown health effects of discharges of taconite tailings. The Eighth Circuit Court held that such discharges "may or may not result in detrimental health effects, but for the present that is unknown". As plaintiffs had failed to prove a demonstrable health hazard, discharges could continue and populations continued to be exposed.

The alarm raised by this decision prompted the introduction of a Bill in Congress to shift the burden of proof to polluters to prove the safety of their discharges. The effect of the reversal arguably would have been that the discharges had to be discontinued. International environmental law shows many cases of equally unsatisfactory outcomes in the allocation of the burden of proof so that in cases of high uncertainty the result is a balance of interests unfavourable to environmental protection. Reversing the burden of proof can induce prevention in cases where thresholds are not crossed and shift the balance between risks and benefits.

Some international regulations provide for a reversed burden of proof. Under the Prior Justification Procedure adopted by the Oslo Commission permits for the dumping of wastes and other matter at sea may only be issued after an a priori determination that threshold levels are not crossed. European Community law applies a reversed burden of proof to the introduction of new substances, such as pesticides, on the market: this is prohibited unless such substances have been proven to be safe. In the management of living resources, regulations for...
whaling and driftnet fisheries have reversed the burden of proof. Another procedure that, to a limited extent, implements the reversal of the burden of proof is the "reverse listing" approach, under which only those substances or activities are permitted which a priori have been judged to fall below threshold levels. Further application and elaboration of a reversed burden of proof in cases of prima facie evidence of risks definitively could contribute to the objective of precaution.

It is important to note, however, that reversing the burden of proof is only one step in a much more complex decision-making process. In particular, reversing the burden should not necessarily exclude all balancing of interests. Rather, the balancing is to be shifted to the stage after it has been established that the burden is or is not met. Illustrative is the failure to do so in the adoption of General Assembly Resolutions 44/225 and 46/215 on driftnet fisheries. These Resolutions assume that driftnets have undesirable impacts on fish stocks, and should not be used, unless the contrary is shown. They erase any consideration of costs and benefits in cases of high uncertainty. These resolutions have been criticized heavily for being too absolute. They would neglect the "probable catastrophic social and economic consequences" of the abrupt termination of driftnet fisheries. If so, this does not necessarily mean that the reversal of the burden of proof is unjustified. What it does signify is that it may be desirable to mitigate the consequences of failing to meet the burden, or, more in general, of crossing threshold-levels.

64. After the moratorium on commercial whaling (established by the Amendments to the Schedule of the International Convention for the Regulation of Whaling, adopted by the 31st Annual Meeting of the International Whaling Commission, July 13, 1979; Bernd Rüster and Bruno Simma, International Protection of the Environment, Treaties and Related Documents, Second Series, III-B/13-07-79), sound evidence is demanded that it is safe to resume whaling, whereas in the pre-moratorium stage the whales demanded sound evidence that whales were endangered.


66. See for a modest application (as the listing in itself does not determine the permissibility of dumping but is only a first step in the decision-making process), Art. 3(2) of Annex II to the 1992 OSPAR Convention, prohibiting the dumping of all wastes and other matter, except for those wastes or other matter listed in Art. 3(2) and 3(3).


68. See Burke, op. cit., n. 65, p. 265; Burke, Freeberg and Miles, op. cit., n. 53, p. 70.
by the fact that the obligations that should implement it leave considerable room for balancing. These obligations can be distinguished in two categories.

**Contextual obligations**

First, the absolutism is mitigated because in most cases the precautionary principle has been incorporated in general due diligence obligations of prevention. Both the precautionary principle and such due care obligations make preventive measures mandatory once threshold levels are crossed. For instance, in the 1992 OSPAR Convention the precautionary principle requires that states take preventive measures when there are reasonable grounds for concern that the introduction of substances into the marine environment may cause harm. At the same time, states are obliged to prevent the introduction of any substance which results or is likely to result in harm. The choice of wording is confusing and disturbing. But it is clear that there is significant overlap between the criteria of the precautionary principle and those of the substantive obligation to prevent pollution.

This takes away much of the absolutism of the precautionary principle. The general due care obligations are so-called contextual obligations. They involve a balancing process in which prevention of risks is only one of the interests to be considered. For instance, under the 1982 Law of the Sea Convention states have to take necessary measures to prevent pollution of the marine environment by using the best practical means at their disposal and in accordance with their capabilities. This formulation leaves room for a balancing: in case of high costs or limited economic or technological capabilities prevention of pollution may not be obligatory. Also determination of what steps are "possible" or "appropriate" to prevent pollution depends on economic and technological capabilities. Because it is included almost in verbatim in the formulation of the general obligations, the precautionary principle will have little force to reduce the scope of this balancing of interests.

**Feasibility analysis**

The scope for balancing interests is reduced, but not eliminated by obligations to apply the best available technology (BAT). In recent treaties this is the dominant obligation for attaining the implementation of precaution. As contextual obligations, the obligation to apply BAT is not an absolute obligation. In determining whether a particular technology is BAT, several factors have to be taken into account, including not only the nature and volume of the discharges and effluents concerned but also the economic feasibility of technology in question.

The scope for the balancing of interests in determining which technology is feasible is considerably more limited than under the contextual obligations. In United States law a sharp distinction has been drawn between full balancing of interests and feasibility analysis. Making BAT obligatory bases the level of control on the capabilities of technology rather than on the result of risk-benefit balancing. What is decisive is whether technology is feasible, not whether, after a balancing of interests, its application is more beneficial than its non-application. Whereas full balancing involves no presumptions for or against prevention, feasibility analysis involves a strong presumption in favour of prevention.

Although the absence of international litigation on this point has not brought the clarity seen in United States environmental law, current treaty definitions of BAT make clear that the interpretation of BAT under treaty law will be basically similar. Where the obligation to apply BAT is the prime obligation to prevent polluting emissions, costs may be considered to determine availability of technology, but a full balance of interests is impermissible. When technology is readily available in technological and economic terms, it has to be applied whenever necessary to achieve the objective of pollution prevention set by a treaty. In such cases BAT comes close to serving the absolutist purposes of the precautionary principle.

However, the precautionary principle and the obligation to apply BAT are not always consistent. They clash when the technology necessary to achieve the objective is too expensive.

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75. Art. 2(1)(a).
76. Art. 2(1)(a) to Art. 1(d).
78. Ibid.
80. This applies primarily to developing countries; see Myron H. Nordquist (ed.), The 1992 United Nations Convention on the Law of the Sea, A Commentary, Vol. IV (1990), paras. 194.10(b), 6.4, but is by no means necessarily confined to such states.
81. Art. 2(1)(a) of the 1992 OSPAR Convention; see also Art. 3(1) of the 1992 Transboundary Watercourses Convention.
82. Art. 2(1) of the 1992 Transboundary Watercourses Convention; see also Art. 3(1) of the 1992 Baltic Sea Convention.
83. See e.g. Art. 2(1)(b) of the 1992 OSPAR Convention; Art. 3(1) of the 1992 Baltic Sea Convention; Art. 3(1)(c) and 3(1)(d) of the 1992 Transboundary Watercourses Convention.
84. ICAL, par. 1 of the 1992 Transboundary Watercourses Convention; Appendix I to the 1992 OSPAR Convention; Annex II to the 1992 Baltic Sea Convention.
85. In American Textile Mfrs. Inst. v. Donovan, 432 U.S., 490, 509, the Supreme Court stated that cost-benefit analysis is not required by the statute involved because feasibility analysis is necessary. See also National Grain and Feed Ass'n v. OSHA, 866 F.2d 717, 737 (5th Cir. 1989).
86. Percival et al., op. cit., n. 59, p. 570.
88. Farber, op. cit., n. 23, pp. 1340-1341.
risks is simply not available. If so, the absolutist aims of the precautionary principle remain illusory, both as a matter of law and in practice. Less extreme, but legally complicated, clashes arise when technology is available, but requires a disproportionate investment as compared to the environmental benefits in terms of risk reduction. The technology required for emission-reductions may be so outlegally complicated, clashes arise when technology is available, but requires a disproportionate test of proportionality between costs and emission reductions.

The key question is where the threshold lies between an unlawful balancing of interests and a legitimate exception in cases of high disproportionality. This involves a refined elaboration of the elements of economic and technological feasibility, issues outside the scope of this chapter. An example may indicate the frailty of this issue, however. A proposed application of BAT to sewage treatment (implying secondary treatment) in Victoria, British Columbia, Canada, would impose considerable costs. BAT would impose $1344 additional taxes, and thereby double existing taxes. The cheaper option of upgrading the existing long sea outfalls (non-BAT) would amount to $8 additional taxes. Ellis states that the application of BAT would provide very little environmental benefit for their costs; it would impose "ridiculous amounts for what is environmentally unnecessary". Arguably this would qualify as a high disproportion, but a case could be made that in view of the availability of the technology and the objective of pollution reduction imposition of BAT is required. Much depends on one's appreciation of the facts, but it is clear that the distinction is a fine one.

The obligation to apply BAT reduces the scope for balancing interests as compared to pre-existing contextual treaty-obligations and is much more supportive of the absolutist aims of the precautionary principle. At the same time, it leaves a small margin of room for exceptions to be made in the case of high costs and little risk reduction. Theoretically, much of the room for balancing left by the obligation to apply BAT can be removed by requiring the application of clean technology. Where clean technology is not yet available such obligations can be technology-forcing, leaving no room for consideration of costs. In the United States, such obligations reflect a Congressional choice that "rejects costs as an excuse debilitating assaults on the population". Several treaties envisage application of clean technology. However, none of them provides for an unequivocal obligation to apply clean technology. The most demanding obligation is to apply BAT, "including, where appropriate, clean technology". This language puts the obligation to apply clean technology in the category of feasibility analysis and even contextual obligations and reintroduces balancing of interests.

Balancing risks and risks

The fifth and final factor allowing for a non-absolutist construction of the precautionary principle is to be found in provisions allowing for risk-risk balancing. Above it was noted that one of the reasons to replace the absolutism of the precautionary principle by a balancing approach is that, given scarcity of resources, it may be desirable to under-regulate some risks in order to regulate others more appropriately. As a matter of policy, treaties should allow states, when taking regulatory measures, the discretion to consider, first, how serious a given risk is in relation to other risks, and, second, to what extent the regulation of that risk will consume resources that might better be directed against other risks. Comparing risks for the purpose of identifying the most adequate allocation of resources for risk-prevention is not inconsistent with a precautionary approach. Rather, a true precautionary policy mandates a comprehensive approach to risks across sources and media. But such an approach is not furthered by an absolutist interpretation and implementation of the precautionary principle. Risk-driven regulation of one industrial sector under one treaty can be a perfect implementation of the precautionary principle, but can also consume resources that cannot be spent on equal or more serious risks in other sectors.

Few treaties incorporating the precautionary principle expressly leave room for a comprehensive regulation of risks. A rare exception is the 1992 Climate Change Convention, that explicitly provides for a comprehensive approach to the implementation of the precautionary principle. Risk-driven regulation of one industrial sector under one treaty can be a perfect implementation of the precautionary principle, but can also consume resources that cannot be spent on equal or more serious risks in other sectors. A true precautionary policy mandates a comprehensive approach to risks across sources and media. But such an approach is not furthered by an absolutist interpretation and implementation of the precautionary principle. Risk-driven regulation of one industrial sector under one treaty can be a perfect implementation of the precautionary principle, but can also consume resources that cannot be spent on equal or more serious risks in other sectors.

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all relevant sources, sinks and reservoirs of greenhouse gases and adoption, and
comprise all economic sectors. An adequate implementation of the precau-
tionary principle does not require that the first risk that meets the eye is erased,
but that risks are considered comprehensively.

However, even when it is not explicitly provided, treaties can be construed in
a way that supports comprehensive approaches. For one thing, the precautionary
principle must be interpreted in view of the objectives and general obligations of
treaties. For instance, the 1992 OSPAR Convention obliges its parties to take
all possible steps to prevent and eliminate pollution. It thereby directs the
parties towards pollution reduction in general. As a result it does not only allow
but also obliges states to compare risks and set priorities, rather than enabling
them to allocate resources to the first risk that happens to come to the top of the
agenda.

A comprehensive approach also is compatible with the feasibility analysis
inherent in the concept of BAT. A rigid interpretation of BAT, under for instance
the 1992 OSPAR Convention, would hold that the combination of the obligations
to apply BAT and to take preventive measures when there is a reasonable
ground for concern implies that once a reasonable ground for concern exists,
BAT is mandatory, without allowing for trade-offs. Resources would be allocated
towards the first sources that happen to be identified. However, the obliga-
tion to apply BAT can be construed in a less rigid manner. In determining what
BAT is, states have to take into account the economic capability of industries. It
is a plausible interpretation that in assessing these capabilities, other risks requir-
ing investment of resources have to be considered. What is economically feasible
can only be assessed when all risks that require resources are considered.

Specific support for construing the precautionary principle in a non-absolutist,
contextualistic way is provided by obligations on cross-media pollution. These
provisions aim to ensure that measures taken to protect one environmental
medium (e.g., water) do not result in pollution being shifted to another medium
(e.g., air). An example is that before being permitted to dump waste in the
North Sea, parties to the 1972 Convention for the Prevention of Marine Pollution
by Dumping from Ships and Aircraft have to compare risks of ocean and land
disposal. Implementation of such provisions requires a comprehensive assess-
ment of risks across media. And in particular, they require a non-absolutist,
comprehensive application of the precautionary principle.

Implementation of such comprehensive approaches is by no means a simple
undertaking. The requirements for adequate risk-assessment and priority-setting
among the various options are demanding and can be a significant obstacle. In
cases where available data signal that threshold-levels in one sector are crossed
and data on risks of alternatives or other media are fragmental, an indicitive
dilemma arises. On the one hand, it is not desirable to devote regulatory
resources immediately to the first risk that tops the agenda; on the other hand,
waiting too long for adequate data on risk-comparison allows continuing expo-
sures to harmful substances. However, in the final analysis the prospect of
such hard choices should not be an impediment to the quest for an optimal alloca-
tion of resources to achieve precautionary policies.

Concluding observations

The history of international environmental law is characterised by repealed fail-
ures to respond in a timely and adequate fashion to environmental risks. The
precautionary principle makes a radical claim to prevent such flaws by requiring
that states prevent all risks of a certain magnitude. But the principle has not been
able to adjust the relevant treaty-provisions to support its absolutist aims.

Its status as a principle, the formulation of its threshold levels, the allocation
of the burden of proof, the interaction with contextual and feasibility-based obli-
gations, and the recognition that some risks have to be accepted in order to erase
others significantly undermine the absolutist claims of the precautionary principle.
This failure has both positive and negative aspects.

It is positive in that it allows for (but arguably insufficiently forces) a compre-
prehensive approach to risk and prevents disproportionate expenditures for minor
risks. Present treaties, in particular their provisions on BAT and cross-media
pollution, go some way to preventing unwarranted absolutism.

95. Art. 2(1)(a).
97. Compare for the role of the objective of a statute in the judicial interpretation of the Clean
Air Act: Downey, op. cit., n. 5, at pp. 374-375.
98. Art. 2(1)(a).
99. Art. 2(3)(b).
583-631, p. 620. See also Stewart, op. cit., n. 25, at 10211 (noting that BAT is itself
ignores the problem of priorities and provides no assurance that resources are devoted to
the most serious risk).
101. E.g. Art. 195 of the 1982 Law of the Sea Convention; Art. 204 of the 1992 OSPAR Con-
vention, proposal for an EC directive on integrated pollution and prevention control (COM
North Sea Decision 89/1).
102. Section 8, Art. 219, op. cit., n. 5, p. 107 et seq.; Lakshman Guruswamy, "A True Comprehensive
Approach", (1992) 9 The Arizona Journal of International and Comparative Law, pp. 115-
130, at pp. 127-128. In the negotiations for the 1992 Climate Change Convention, lack of
adequate and reliable data was a major argument put forward against a more prominent role
for the comprehensive approach; see Bodansky, op. cit., n. 29, pp. 518-519.
103. See Latin, op. cit., n. 5, p. 107 et seq.; Lakshman Guruswamy, "A True Comprehensive
Approach", (1992) 9 The Arizona Journal of International and Comparative Law, pp. 115-
130, at pp. 127-128. In the negotiations for the 1992 Climate Change Convention, lack of
adequate and reliable data was a major argument put forward against a more prominent role
for the comprehensive approach; see Bodansky, op. cit., n. 29, pp. 518-519.
It is negative in that in several respects treaties are unduly unsupportive of the objectives of precaution. The indeterminacy of threshold levels, the insufficiently developed procedures to address risks below threshold levels and the allocation of the burden of proof can detract significantly from the objective of precaution. In these respects the precautionary principle needs considerable elaboration.

There is little doubt, however, that the margins for a free balancing of risks, the cost of regulatory measures and benefits of risk-generating activities are narrowing. Both the further development of substantive law (such as the specification of threshold levels and the replacement of full balancing by feasibility analysis) and the evolving procedural rules (such as the reversal of the burden of proof) will increasingly pre-empt decisions of states to allow beneficial, but risk-generating activities. This development in international environmental law is not surprising; it follows patterns well-established in national environmental law. The intricacy of the legal issues raised by the development of the precautionary principle signals the fact that international environmental law has grown beyond a primitive and basic set of rules to a legal regime reflecting the complexity of the issues it aims to regulate.

PART II

The Wider Context of Implementing the Precautionary Principle