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Balancing the Protection of Marine Ecosystems with Economic Benefits from Land-Based Activities: The Quest for International Legal Barriers

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The major threats to the health, productivity, and biodiversity of the marine environment result from human activities on land. National laws have failed to provide an adequate response. In conformity with the obligations contained in the 1982 Law of the Sea Convention, in recent years states have launched new legislative attempts that have as their stated objective to give more priority to protection of the marine ecosystem from land-based activities. The 1995 Global Programme of Action as well as regional treaties and programs provide for a wide variety of alternative strategies, including monitoring, economic instruments, raising of awareness, and capability-building that all as a matter of urgency need to be pursued. This article discusses what has become the dominant substantive strategy: development and implementation of best available techniques and best management practices. The article describes the rationale underlying the application of these approaches in international law and examines how recent treaties and action programs have incorporated them. The article concludes that in several respects the law is inadequate, but that the main problem is the lack of commitment of states to accept obligations to apply technology-based standards or practices that are sufficiently responsive to the need for protection of the marine ecosystem.

This article assesses the emergence and implications of international legal obligations that aim to curtail the freedom of states to balance protection of marine ecosystems from land-based activities (LBAs)¹ against, and subordinate to, their economic needs.

The policy considerations underlying development of these obligations are compelling. Degradation of marine ecosystems by LBAs remains a pressing problem. Land-based sources are estimated to contribute 80 percent of all marine pollution.² Land use and construction practices in coastal zones impose further pressures on marine ecosystems by, among other things, siltation.³ In coastal areas, effects of LBAs have reached

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critical proportions and are endangering human health and marine living resources.⁴ This is especially worrisome as 90 percent of all marine living resources spend critical portions of their lifecycle near coastal waters. With an expected increase of population pressure on coastal zones, these threats will increase in years to come.

National laws have been unable to avert these problems. Legal development and enforcement have been bridled by potential economic consequences. Laws that impose requirements for sewage treatment, technological performance standards on industries, or requirements to reduce livestock or phase out use of pesticides in the agricultural sector can cut deeply into national and local economies. For the Mediterranean Sea alone, adequate control of LBAs is estimated to cost between \$25 and \$100 billion over the next 20 years.⁵ Apprehension over high costs has induced governments to adopt inadequate laws and undertake inadequate enforcement policies. The effect is that protection of the marine ecosystem has been sacrificed to economic benefits from LBAs.⁶

It has long been envisaged, therefore, that national laws should be subjected to international laws that induce states to strike a more satisfactory balance of interests. Article 207 of the 1982 United Nations Convention on the Law of the Sea, the foundation of the legal regime on land-based pollution (LBP), obliges states to endeavor to establish global and regional rules to prevent it,⁷ but practice offers little hope that governments are willing to accept international rules that require them to adjust their national policies. States wish to preserve for themselves considerable freedom in balancing environmental protection against perceived economic needs.⁸ International laws that actually impose barriers to such balancing by states are few and far between, and the present regime allows governments much discretion to lawfully justify LBAs that cause harm to marine ecosystems by invoking the trite argument that they are economically incapable, or consider it simply economically undesirable, to prohibit or adjust such activities.⁹

The inefficacy of contemporary international law is now widely recognized. In recent years, governments have launched new legislative attempts with the stated objective of giving greater priority to protection of the marine ecosystem. At the regional level, existing and inadequate treaties have been modernized: Outstanding examples are the 1992 Conventions for the Protection of the Marine Environment of the North-East Atlantic¹⁰ and the Baltic Sea.¹¹ Other recent legal instruments cover the Black Sea¹² and the Persian Gulf.¹³ A revised Protocol on the Mediterranean and a new Protocol for the Wider Caribbean region¹⁴ are also being developed. These regional treaties have been supplemented by the Global Programme of Action, adopted in November 1995.¹⁵ This Programme aims to carry out the generally formulated obligations of the 1982 Convention and the ill-fated 1986 Montreal Guidelines.¹⁶ It thus furnishes normative guidance and provides incentives and capabilities to enhance protection of marine ecosystems from LBAs.

All of these instruments carry the expressed aim of inducing changes in national policies concerning LBAs. They all provide for a variety of policy instruments to achieve that objective, including economic instruments, data gathering, and financial and technological cooperation, but by far the most dominant regulatory approach in these instruments is the obligation to develop and apply best available technologies (BATs) and best environmental practices (BEPs) to LBAs that may affect the marine ecosystem. It is these obligations that supposedly are intended to guide states toward providing more protection for marine ecosystems.¹⁷

There is no need to doubt good intentions of the authors of these treaties, yet the practical significance of the substantive standards of BATs and BEPs remains uncertain at best. The emphasis on the regulatory approach of BATs and BEPs is based on expe-

riences in national law. Little thought has been given to how, if at all, they should be applied at the international level, where economic and environmental priorities between states differ markedly. The adoption of BAT and BEP obligations as international obligations opens a Pandora's box of critical legal and policy issues. This analysis reveals that the states and international organizations have identified those elements that ideally should be part of a functioning regulatory strategy involving BAT and BEP standards: There are obligations to apply BATs and BEPs; there are mandates for international institutions to further develop and specify BATs and BEPs; there are provisions that link BATs and BEPs to ecosystemic needs, and thought has been given to the need for financial and technological cooperation. However, development and implementation of these elements remains an uphill struggle in a regime where each state and sub-region considers its priorities different from the next state and sub-region. The gap between the potential of BAT and BEP standards and actual state practice is wide.

This article traces the development and legal implications of obligations to apply BATs and BEPs in the legal regime applicable to LBAs. The next section describes the rise of obligations to apply BATs and BEPs in the international regime for LBAs. The third section explains how the regime for LBAs has been dominated by the notion of differentiability, which suggests that each (sub-)region should develop its own approach to problems caused by LBA. Next, an appraisal is made as to what extent these obligations actually do reduce state discretion in considering how costs affect taking regulatory decisions on LBAs and following that, the implications for international institutions are examined: The practical meaning of BAT and BEP standards will depend on the way such institutions exercise their mandate to define source-specific BAT and BEP standards. The final two sections discuss two ways to bolster the practical significance of BAT and BEP standards, namely by linking them to ecosystemic needs and by bridging diversity between states and regions.

The analysis draws substantially on U.S. environmental law.¹⁸ The international legal obligations to apply BATs and BEPs find their source and inspiration in national laws, arguably most prominently in U.S. law.¹⁹ References to U.S. law serve as a frame of reference for understanding and appreciating the possibilities and limitations of feasibility analysis in international law. With due caution, they also can assist in interpreting the comparable concepts in international law.²⁰ Of course, the fundamental differences between national and international law call for caution in identifying analogies, but in case of differences, the frame of reference of national law is a valuable one. For instance, U.S. law has demonstrated the need to brace the concepts of BATs and BEPs by procedural and institutional arrangements that cannot automatically be transplanted to the international level and that seriously call into doubt the practical relevance of these standards in international law.²¹

The Evolution of the Regime for LBA: From Cost-Benefit Analysis to Feasibility Analysis

The Prevailing Discretion to Balance Costs and Benefits

Traditionally, the legal regime for LBAs has allowed states wide discretion to lawfully justify LBAs that cause harm to marine ecosystems by invoking the argument that they considered it economically undesirable to prohibit or adjust such activities.

In a provision that can safely be considered to represent customary law, the 1982 Convention obliges states to take necessary measures to prevent LBP by using the best

practical means at their disposal and in accordance with their capabilities.²² Comparable obligations are incorporated in regional treaties. The 1992 North-East Atlantic Convention obliges parties to

take *all possible* steps to prevent and eliminate pollution and [to] take the necessary measures to protect the maritime area against the adverse effects of human activities so as to safeguard human health and to conserve marine ecosystems.²³

These obligations formally hold that states cannot simply prioritize cost considerations over protection of marine ecosystems, and as such they restrict states' discretion.²⁴ The obligations assume that pollution is prevented *unless* costs do not allow that. There is presumption of control, but obviously discretion in determining whether prohibition or adjustment of certain LBAs is "possible" or "within the capability" of states remains broad. The provisions are contextual.²⁵ Whether prevention of LBP is obligatory under the 1982 Convention depends on assessment of what states are capable of in economic and technological terms.²⁶ Arguably, the same holds for the terms "possible" and "appropriate" as used in the 1992 North-East Atlantic Convention and the 1992 Baltic Sea Convention,²⁷ though the meaning of these terms is not well established.²⁸ In the absence of adequate supervisory procedures that interpret these terms,²⁹ *de facto* each government can decide for itself. The same states that accepted these obligations have asserted that the insertion of words such as "as far as possible" and "as appropriate" in obligations are "for all practical purposes, giving license to the countries to do whatever they wish."³⁰

Regional treaties do envisage that these contextual obligations be supplemented by more specific and demanding obligations, but attempts to formulate such specific obligations have mostly failed. Older treaties covering LBAs in the Mediterranean Sea³¹ and the Northeast Atlantic aimed to eliminate pollution by hazardous substances "as a matter of urgency," but this has largely remained an unfulfilled ambition. The obligation to identify and eliminate persistent, toxic, and bioaccumulative substances was defective in the first place; since it failed to provide for any thresholds regarding the amount of proof required,³² states could freely and lawfully decide to eliminate pollution by substances contingent on such high degrees of scientific certainty that nothing happened. Though several substances have been identified as hazardous and potentially subject to elimination, only for a few has the obligation to erase pollution actually taken effect.³³ *De facto*, most sources of LBP remained regulated only by contextual and virtually symbolic obligations.

The Rise of Feasibility Tests

Induced by the ineffectiveness of contextual obligations as instruments to restrict states' discretion and inadequate regulatory approaches for hazardous substances, states have introduced, in recent treaties, more demanding restrictions in the form of obligations to apply BATs and BEPs.³⁴

The 1992 North-East Atlantic Convention obliges states, in order to attain the objective of prevention and elimination of pollution from land-based sources, to adopt measures that require the use of BATs.³⁵ A comparable obligation is contained in the 1992 Baltic Sea Convention.³⁶ The standards of BATs are to be applied on an industry-wide basis. This obligation intends to reduce state discretion in giving preference to

economic considerations for regulating industrial sectors. If a certain technology has been identified as the BAT for a sector, it must be applied, and cost considerations should play a secondary role.

The obligation to apply BATs is accompanied by the duty to apply BEPs to reduce the traditionally neglected problem of diffuse sources.³⁷ The 1992 North-East Atlantic and Baltic Sea Conventions take an ambitious approach and even envisage the *elimination* of pollution from nonpoint sources³⁸—an objective so overly ambitious that even its symbolic function is doubtful. The dominant standard of behavior that should bring the objective within reach is that governments should promote and implement policies aimed at the best environmental protection.³⁹ The concept of BEPs is comparable to that of BATs in that it aims to reduce the scope of discretion for balancing costs and benefits by providing criteria for what is the “best” practice to be applied. If a practice is identified as BEP, it is to be applied by states, with cost considerations again playing a secondary role.

The northeast Atlantic and the Baltic Sea examples appear to have influenced other regulatory developments. At the worldwide level, the Global Programme of Action explicitly envisages the definition and application of BATs and BEPs as management strategies for the control of LBAs.⁴⁰ The example of BAT and BEP standards has also been followed in other regions. Examples include the Black Sea⁴¹ and the Wider Caribbean region.⁴² While many regions as yet have no agreements that apply to LBAs, Agenda 21 induces states to conclude such agreements.⁴³ This is relevant to, *inter alia*,⁴⁴ the South Pacific, the northwest Pacific, the East Asian seas, the Gulf of Aden and the Red Sea,⁴⁵ and the West and Central African region.⁴⁶ There is scant doubt that improved development of BAT standards will be a key element in further developing these regional instruments.⁴⁷

The standards of BAT and BEP formally impose international legal barriers that prevent states from freely balancing the interests of protection of marine ecosystems with economic benefits of LBAs, which is not to say that, as a matter of legal practice, governments confine their discretion. The implications of the BAT and BEP standards are analyzed below.

The Model of U.S. Law

Increasing reliance of LBP treaties on BAT and BEP standards is strongly influenced by domestic regulatory experiences. The United States’ experience with BAT and BEP standards yields two lessons relevant to the international regime on LBP: First, it illustrates the policy theory that these standards actually attempt to reduce discretion in balancing economic costs and environmental benefits. Second, it shows that, even on the national level, developing nationwide BAT and BEP standards remains problematic, given local economic and regional peculiarities.

Use of BAT and BEP standards in U.S. environmental law, and the extent to which they allow costs to be considered, is strongly determined by the choice of Congress to have water quality policy dictated by the need for safe water rather than by a balance of costs and benefits. The Clean Water Act (CWA) aimed to eliminate all pollutant discharges from surface waters by 1985,⁴⁸ and prohibits discharge of any pollutant except when explicitly authorized.⁴⁹ These absolutist no-discharge provisions are accompanied by equally cost-oblivious⁵⁰ quality objectives. In 1972, Congress established the national goal of fishable and swimmable water everywhere by 1983;⁵¹ to achieve that goal, the CWA provides for quality standards that, for the most part, are absolutist, health- and

effects-based,⁵² and must be attained through whatever economically demanding source controls are required.⁵³

These objectives were clearly beyond reach. Still, the reasoning underlying the BAT and BEP standards is illustrative. Congress recognized that if it left full discretion to federal and state administrations to balance benefits and costs, there would be few guarantees that the cost-oblivious objectives of the CWA ever would be achieved. Therefore, it imposed on all sources of water pollution obligations not based on what might be beneficial after considering costs and benefits, but on a much narrower analysis of what is economically and technologically feasible in order to progress to the ultimate health- and environment-based objectives. Decisive is whether the technology necessary for emission reductions is feasible, not whether it is more beneficial after balancing costs.⁵⁴ Whereas full balancing involves no presumptions for or against prevention, feasibility analysis involves a strong presumption in favor of control.⁵⁵

For point sources in particular, feasibility analysis strictly reduces the extent to which costs can be considered. Discharges of toxic pollutants were mandated to comply with the standard of BAT by 1989, a date that later proved illusory.⁵⁶ In determining whether any given technology is feasible, the Environmental Protection Agency (EPA) must *consider* the costs of meeting BAT limitations, but need not balance costs with benefits of effluent limitations.⁵⁷ The EPA must evaluate what needs to be done to progress toward elimination of the discharge of pollutants and what is attainable through the application of available technology, irrespective of cost.⁵⁸

For nonpoint sources, which long have been exempted from the demanding feasibility approach applicable to point sources,⁵⁹ a comparable standard of behavior has emerged in the form of best management practices (BMPs).⁶⁰ This standard compares to the international legal standard of BEPs. The feasibility test for BMPs is relatively undefined and less exacting than that for BATs. Management practices can constitute BMPs when economically achievable, and they reflect the greatest degree of pollution reduction achievable through application of best available nonpoint pollution control practices, technologies, processes, siting criteria, operation methods, or other alternatives.⁶¹ Otherwise, in contrast to feasibility-based standards for point sources, discretion is left to states to examine whether particular measures are appropriate for source, location, climate, and other local conditions, and whether they are economically achievable.⁶² Congress did not want to encroach on state and local land-use decisions,⁶³ and the outcome of any conflict between economic development and environmental protection in coastal areas is left primarily to the determination of states.⁶⁴

Formally, both BAT and BMP standards constitute statutory barriers against full balancing, and it is this feature that makes them relevant models for the international regime for LBAs. Feasibility analysis has given rise to massive litigation on questions such as what precisely constitutes "best practicable" or "best available," to what extent BPTs and BATs can be technology forcing, and to what extent cost considerations must be taken into account in individual cases. Some of these questions also apply to comparable standards now being developed in international law, and will be discussed below.

But the United States' experience also provides a more somber lesson for international law. Development and implementation of BAT, and in particular BEP, standards have been slow and cumbersome. Target dates proved beyond reach in practice and were replaced by new targets that also proved beyond reach. In the case of BEPs, the United States has scarcely begun to promulgate nationwide standards that should force states to initiate more preventive policies. In the face of economic and ecological differ-

ences, development and implementation of BAT and BEP standards have largely remained theoretical potential with insufficient practical results.

The International Setting: The Preference for Differential Standards

It has always been clear that developing international BAT and BEP standards would be a difficult uphill struggle. If developing national BAT and BEP standards is difficult, doing so on the international level approaches the impossible. The critical problem revolves around how to develop such standards against a background of social, economic, cultural, and ecological differences that characterize LBAs in various countries and regions. BAT and BEP standards are categorical standards. In principle, they are uniform: They treat sources within industrial or agricultural sectors similarly, but the international regime for regulating LBAs cannot and should not impose uniform standards for *all* states regarding *all* types of LBAs.

The types of LBAs that may harm the marine ecosystem differ greatly between regions and states. This is especially true for sewage, nutrients, and debris, and for activities that result in coastal erosion, siltation, and physical destruction of the marine environment. Geographical circumstances make nutrients a much bigger reason for concern in the North Sea than in other parts of the northeast Atlantic.⁶⁵ Similar differences exist in the Caribbean.⁶⁶ Imposing equally demanding requirements on agricultural practices or sewage treatment in ecologically differing regions may be unnecessary and lead to a waste of resources.

Resistance against uniform regulation is compounded by differences in economic capabilities of states, most of all between developed and developing states.⁶⁷ Imposing a juridical uniformity that for some states could require massive economic sacrifices in conditions of economic inequality conflicts with what, in recent years, have become agreed standards of equity. The 1982 Convention provides that, in setting international standards, countries must take into account the economic capacity of developing states and their need for development.⁶⁸

Such differences are generally recognized to warrant differences in standards. The 1992 Rio Declaration stipulates that environmental standards and priorities should reflect the environmental and developmental context to which they apply and adds that "[s]tandards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particular developing countries."⁶⁹ This general principle applies fully to LBP.⁷⁰ Uniform standards that do not take account of differing ecological and economic conditions can be too lenient or too stringent for site-specific conditions, and impose more or less costs on industries than necessary to achieve the required level of pollution prevention.⁷¹ A standard that represents the best available technology in one region may not be the best available technology in another.⁷²

These observations provide only starting points for analysis. The policy choices here have hardly been confronted, let alone been addressed. Is each state, each sub-region or region to decide for itself whether uniformity is warranted, and *to what extent* differentiation is to be allowed? To what extent can industries or agricultural practices in different states, operating in different economic and ecological circumstances, be lumped together into one category for the purpose of BAT and BEP rule making?

States have answered these questions with an overwhelming preference for regulation on a regional and sub-regional basis.⁷³ The world is divided into regional seas agreements, with new treaties being envisaged for as-yet uncovered regions. In principle, contracting parties to these agreements define the standards to be applied throughout the

region. At present, no global obligation exists for applying BATs, let alone specific BAT standards for source categories. Such standards clearly would not be easily negotiable.⁷⁴ The 1982 Convention and the Montreal Guidelines do not set any substantive standards for source categories; the Global Programme of Action adds nothing to change this.

It is not apparent, from a policy perspective, that a (sub-)regional approach is an adequate response to pollution problems affecting marine ecosystems. Persistent organic substances can have worldwide effects through atmospheric transport or through bioaccumulation in organisms. It is unwarranted to leave the discretion to balance costs and benefits of regulatory action for such substances to individual states or regionally limited groups of states.⁷⁵ Globally applicable standards also may be appropriate for a less dramatic cause of marine degradation such as solid waste. No valid ecological or economic differentiation arguments appear to justify that the (BEP) standard holding that all governments should prohibit dumping solid wastes on beaches or along stream banks and should provide adequate containment of landfills close to rivers and oceans should apply in some regions but not in others. This standard is common-sense marine environmental protection policy. Whereas implementation may require all sorts of support, the *norm itself* is not an issue for debate.

Translation of these policy considerations into political and economic realities is bound to be problematic. Indeed, if anything, practice shows a trend towards lower rather than higher levels of regulation. Many states consider the regional level to be too heterogeneous to address particularized LBA problems effectively. Regions are primarily defined in geographical terms.⁷⁶ This makes certain regions, like the Caribbean and the northwest Pacific, and to a lesser extent the northeast Atlantic, include states with widely varying characteristics. The 1992 North-East Atlantic Convention explicitly recognizes that the northeast Atlantic region may be too heterogeneous in terms of ecological and economic conditions, and that differentiation may be appropriate. Article 24 provides that decisions or recommendations may apply to only a specified part of the maritime area covered by the Convention, and may provide for different timetables to be applied, "having regard to the differences between ecological and economic conditions in the various regions and sub-regions covered by the Convention." The implicit suggestion is that the states bordering the North Sea may be made subject to more stringent standards than states in the southern part of the northeast Atlantic.⁷⁷ In practice, most BAT standards adopted by the Commission reestablished under the Convention set common, undifferentiated standards,⁷⁸ but it remains a plausible assumption that this derives from the relatively limited degree to which standards are demanding, something that applies to recommendations on BEPs by the fact that they are not legally binding, and by the fact that states can enter reservations.

Similar sub-regionalization for BAT or BEP standards has been contemplated in other regions. In the development of the protocol on LBP for the Wider Caribbean region, the question has arisen as to whether additional costs for secondary treatment (although widely accepted and applied as BATs in western Europe) are worth the costs as compared with primary treatment (sub-BATs) and long outfalls.⁷⁹ In the European Union, southern member states successfully negotiated a draft Directive on Integrated Pollution Control that would allow them to consider geographical factors and existing environmental conditions, rather than having to apply predetermined uniform BAT standards.⁸⁰ The Global Programme of Action, rather than calling for concerted regional efforts, deals with BAT and BEP standards mostly in the context of national actions, suggesting that the national level is the most appropriate level of regulation.

The result of the dominance of this "differentiality thinking" is that regulation re-

mains pursued at a low level, with a preference for regional over global, sub-regional over regional and, as emphasized by the Global Programme of Action, national over sub-regional approaches.

Margins for Balancing Costs and Benefits under BAT and BEP Standards

Against the background described above, the prospects for uniform BAT and BEP standards that correspond to the needs of the marine ecosystem have always been bleak. Practice in recent years is fully in line with these prospects. Only in a few regions have states actually been able to agree on regulatory strategies based on BATs and BEPs. For others, it is being considered. The practice described below that involves highly homogeneous and economically-advanced regions leaves few illusions about willingness and capabilities in other regions.

The international legal concepts of BATs and BEPs appear to be intended as comparable legal barriers against full balancing, but they expressly *do not* exclude cost considerations. The 1992 North-East Atlantic Convention defines BATs in what might be considered paradigmatic terms as

the latest stage of development (state of the art) of processes, of facilities or of methods of operation which indicate the *practical suitability* of a particular measure for limiting discharges, emissions and waste.⁸¹

In determining whether certain techniques qualify as BATs, "special consideration" shall be given to

- (a) comparable processes, facilities or methods of operation which have recently been successfully tried out;
- (b) technological advances and changes in scientific knowledge and understanding;
- (c) the economic feasibility of such techniques;
- (d) time limits for installation in both new and existing plants;
- (e) the nature and volume of the discharges and emissions concerned.⁸²

Thus, the obligation to apply BATs does not rule out cost considerations. It incorporates a balance of interests between the economic feasibility of the technology (sub paragraph c)⁸³ and the nature and volume of the discharges (sub paragraph e).

The concept of BEPs, too, is defined such that it does not exclude cost considerations. The 1992 North-East Atlantic Convention defines BEPs as "the application of the most appropriate combination of environmental control measures and strategies."⁸⁴ The treaty sets forth a number of criteria that should be considered in determining what constitutes BEPs. These include the environmental hazard of a product and its production, use, and disposal; the substitution by less polluting processes and substances; potential environmental benefit or penalty of substitute materials or activities; and *social and economic implications*.⁸⁵ The treaty adds a long list of measures that should at least be considered in determining BEPs. These include the provision of information and education about the environmental consequences of certain LBAs, developing codes of good environmental practice, labeling, restricting the use of hazardous substances, and recycling.⁸⁶

The obligation to apply BEPs is contextual in the extreme. What constitutes BEPs

depends on a process of balancing of various, often contradictory, aspects, including social and economic implications. No activity is *a priori* incompatible with the obligation to use BEPs and, theoretically, in a particular context extensive use of fertilizers also may qualify as such.

In theory, the obligations to apply BATs and BEPs for the purpose of reducing harm to marine ecosystems precludes full balancing. On this point, the interpretation of the BAT concept in U.S. law would seem to apply. Thus, costs may be considered in determining achievability, but a full balance of interests will likely not be permissible. What remains decisive is whether the technology necessary for achieving prevention and elimination of pollution from LBAs is feasible, not whether it is more beneficial after balancing.

Whether this interpretation has any practical significance, though, is highly doubtful. A distinction needs to be made here between the obligations to apply BATs and BEPs as they apply both to international institutions and to individual states. On the one hand, obligations are addressed to international institutions established under the treaty concerned, that is, e.g., the Commission established under the 1992 North-East Atlantic Convention (OSPAR Commission). (The implications of these obligations will be discussed later in this article.) On the other hand, the obligations are directed to individual states. Contracting Parties to the North-East Atlantic Convention shall *individually* require the use of BATs and BEPs.⁸⁷ Unless international standards for BATs and BEPs have been agreed upon, obligations to achieve BATs and BEPs impose only theoretical barriers. Each government may choose for itself what weight it attaches to practical suitability or economic feasibility.

National courts or international supervisory mechanisms may, in a specific case, conclude that states have accorded too much weight to these factors and that more demanding technologies or practices can be applied, but in over 20 years of experience with treaties on LBP, no national court decisions have occurred where treaty provisions have been invoked. The international supervisory bodies lead a marginal existence.⁸⁸ With but limited use of national courts and no operational supervisory bodies, no one is going to double-check a government's own assessment of its achievability of certain technologies or practices. For these reasons, the impact in legal practice of BAT and BEP standards depends primarily on the degree to which international institutions define international, binding, and specific standards with which states must comply.

Specification of BAT and BEP Standards by International Institutions

Mandate of International Institutions

Apart from being obligations directed at individual governments, BAT and BEP standards are also addressed to international institutions established under treaties on LBAs, e.g., the OSPAR Commission established under the 1992 North-East Atlantic Convention and the Helsinki Commission established under the 1992 Baltic Sea Convention. The OSPAR Commission is obliged to draw up programs and measures for the protection of marine ecosystems, which define application of BAT and BEP standards for specific source categories: BAT standards for industrial sectors and BEP standards for, e.g., nutrients and pesticides.⁸⁹

In an ideal legal regime unencumbered by practical constraints, the role of these institutions in the development and specification of BAT and BEP standards would be critical. They should fulfill two functions: First, they are empowered to harmonize BAT

and BEP standards to prevent competitiveness effects. The argument that U.S. federal law would free states from the temptation to relax local limitations so as to keep or protect local facilities⁹⁰ applies fully to the international regime for LBAs. When industrial or agricultural activities are common to different states and regions, harmonization of national standards may be found important to protect competitiveness. Without international standards, every individual government might legitimately take into account impacts on competitiveness in its assessment of economic feasibility, and might subsequently decide that standards are not feasible. The importance of such harmonization is recognized in the 1982 Convention and will be a critical consideration in further development of the regime.⁹¹

Second, if institutions are to make a difference in the quality of environmental protection, they should upgrade levels of the protection in at least some states. International BAT standards have to be economically and technologically attainable in order to qualify as being feasible. If institutions demand technologies that offer total protection to marine ecosystems but are forever out of reach, no source will be able to comply. Nevertheless, BAT standards must go beyond presently prevailing practices if they are to induce changes in behavior and push policies toward protection of marine ecosystems, as mandated by the treaties.⁹² If BAT and BEP standards are to move protection of the marine ecosystem forward, they must be demanding in terms of feasibility, up to the point to where they push technology in new directions, at least in some states.

The concept of BATs does not oppose, and even requires, such an upgrade of technology standards. This thesis is supported by the interpretation of feasibility analysis in U.S. law. Rather than prescribing what is already there, the standard of BAT aims to press for technology currently not in routine use or not in use at all.⁹³ Feasibility tests in international law can be interpreted broadly as well, basing standards on the best performers in the region.⁹⁴ Moreover, recent instruments explicitly provide for imposing such technology. The 1992 North-East Atlantic Convention obliges states to impose BATs and BEPs, including, "where appropriate," clean technology.⁹⁵ Development of clean technology also has been identified as a priority in other regions,⁹⁶ as well as in Agenda 21 and the Global Programme of Action.⁹⁷ In present formulations, international obligations to compel technological advancement leave considerable discretion. The 1992 North-East Atlantic Convention makes the obligation to push technology in cleaner directions contingent on a discretionary judgment as to whether it is "appropriate." If the obligation is viewed as applying to *individual* states, this will, for all practical purposes, diminish much of its legal significance. However, it is important to establish that it is *within the mandate* of international institutions to move technology forward. Individual governments could not challenge a decision of the OSPAR Commission because it prescribed technologies that appear unavailable at the time.

Role of International Institutions in Practice

The above mainly remains theory. Two features in particular have caused a huge gap between the theoretical construction set out above and the contribution of international institutions in practice.

First, the difference between the obligation of institutions on the one hand, and those of individual states on the other, is gradual. The institutions are composed of all contracting parties and cannot be compared to an independent body such as the EPA, which established specific BAT and BEP standards. Although the OSPAR Commission can adopt BAT and BEP standards by a three-quarters majority (and in practice has

done so), individual states can opt out of such decisions.⁹⁸ One or more states have entered reservations to virtually any recommendation that is adopted.

Second, existing institutional arrangements are hardly suited for the daunting tasks of adequately determining what is technologically feasible. In setting feasibility-based standards, international institutions must demonstrate with a sufficient degree of probability that industry will be able to meet those standards.⁹⁹ Such determination is critical, especially now that institutions are mandated to engage in technology forcing.¹⁰⁰ At present, no formal arrangements for determining feasibility exist. Practice in the OSPAR Commission is that one contracting party acts as a lead country and identifies what it thinks are BATs for a particular source category. That determination may or may not be accepted by other parties and thus may or may not result in a formal determination of BATs. The burden on the lead country is demanding, and examples abound where lead countries could not or, perhaps more accurately, did not wish to fulfill the burden.

If states should develop a genuine commitment to setting international BAT and BEP standards, strengthening institutional data-gathering capabilities and procedural refinements to determine what is feasible seems inevitable.¹⁰¹ For instance, some guidance will be required as to what data are to be used in demonstrating that standards can be met.¹⁰² Such procedures must involve close consultation with the private sector, giving it input to the rule-making procedures in which technology-forcing provisions are established, as well as to any subsequent re-examination. Recently, instruments for LBAs have shown some recognition of this last point.¹⁰³

At present, all this exists only in rudimentary form. That it does not create problems for states or industrial/agricultural sectors that dispute any standards for substantive or procedural reasons is due to the fact that the readiness of states to make international BAT and BEP standards truly effective appears limited. In recent years, both the OSPAR and Helsinki Commissions have made considerable quantitative progress in defining international standards for source categories. Recent recommendations and decisions of the OSPAR Commission cover such sources as existing primary iron and steel production, uses of hexachloroethane in the nonferrous metal industry, discharge of mercury from dentistry, and inputs to the environment of pesticides from agricultural use.¹⁰⁴

Even so, the relevance of all this should not be overestimated. For one thing, the OSPAR Commission maintains its policy of adopting BAT and BEP standards as legally nonbinding recommendations rather than as legally binding decisions. Although all sorts of qualifications are made on the relevance of the distinction between legally binding and legally nonbinding rules in international environmental law,¹⁰⁵ the bottom line is clear: If governments were seriously committed to implementing these documents, there is no reason they should not opt for legally binding decisions. After all, the same governments provided for the possibility of making such decisions in the treaty.¹⁰⁶ Doing so could greatly enhance the possibility for decentralized enforcement in courts of contracting parties. Even without empirical research, the choice for recommendations creates a presumption of lack of commitment.

This bleak picture is compounded by the realization that the BEP standards adopted thus far are mostly formulated in such flexible terms that they are unlikely to compel any change in the prevailing balance of interests struck by states.¹⁰⁷ The newer agreements have not successfully overcome the inability to deal adequately with the problem of diffuse sources. In this respect, they do not lag much behind national laws. Whereas, arguably, many management practices are economically easily achievable,¹⁰⁸ there are few mandatory federal legal safeguards to make states overcome "formidable economic and political pressures," even in the United States.¹⁰⁹

How well the OSPAR Commission and other regional institutions succeed in effecting detailed and demanding standards for source categories adopted and implemented will be critical for how well these standards curtail the discretion of governments to prioritize cost considerations over the aim of protecting marine ecosystems. Present practice offers only limited hope that such institutions might actually realize the potential strengths of the BAT and BEP standards.¹¹⁰

Linking BAT and BEP Standards to Ecosystem Needs

While preference for national and sub-regional regulation corresponds to economic and political realities, this has little to do with the accepted objective of all treaties for LBAs, namely protection of marine ecosystems. The need for differential standards is well established in international law, but an important distinction must be drawn between differentiation of *means* and differentiation of *objectives*. Differentiation of means (such as BATs and BEPs) can be easily justified because these standards cannot be applied across-the-board. However, such standards are only means to the objective of protecting marine ecosystems. Differentiation of that objective is much less easily justifiable.

The objective of protection of marine ecosystems from LBAs should equally apply, and on the basis of the 1982 Convention, does equally apply, to all states. Specific BAT and BEP standards that must be applied to secure that objective will differ depending on local conditions, but these disparate standards should function within the overall objective of protecting marine ecosystems as it applies globally. Differentiation of that goal is undesirable. A zero-tolerance objective for debris and effluents is valid everywhere.

The agreed objective of protection of the marine ecosystem implies that governments should have no unfettered discretion to establish their own BAT and best environmental protection standards. States are not obliged to apply BATs and BEPs for their own sake. On this point, reference to U.S. law is helpful. Interpretation of BAT standards in U.S. law is directly determined by the aim of eliminating discharges and achieving cost-oblivious quality objectives.¹¹¹ These objectives, however generally formulated, give feasibility analysis its presumption of control, rather than permitting full balancing.¹¹² Feasibility analysis offers a means to attain these objectives, not a way to formulate an objective itself;¹¹³ it serves to assess *when* and *how* goals are met, not *whether* they are met.¹¹⁴

The same holds for BAT and BEP standards in international law. Such standards should be applied to prevent and eliminate pollution of the marine environment, as well as to protect the marine ecosystem from adverse effects of human activities.¹¹⁵ This means that differentiation of standards should always be justified against agreed objectives. For instance, it has been argued that to impose costs for secondary sewage treatment on Caribbean states is ecologically unnecessary and thus undesirable.¹¹⁶ If such fine tuning cannot be supported by scientifically-based data to support that claim, differential standards seem an improper implementation of the objective of pollution prevention. The 1992 North-East Atlantic Convention explicates this: It allows for differential standards, but only by reference to different ecological conditions.¹¹⁷ When it cannot be proven that ecological conditions can indeed tolerate more lax standards in one region than in another, the permissibility of differentiation is doubtful.

The problem in practice is how the link between BAT and BEP strategies and ecosystem needs should be implemented. The 1992 North-East Atlantic Convention specifies the link between BATs and BEPs and the objective of protecting the marine ecosystem. If reduction of discharges resulting from the use of BATs or BEPs does not lead to

"environmentally acceptable results," then "additional measures have to be applied."¹¹⁸ Implementing such concepts is immensely complicated, however, and appears beyond the reach of present institutional and scientific capabilities and political will. Implementation of standards requires that governments define with sufficient precision what are "environmentally acceptable results." Only on the basis of such specifications, for instance, can it be established that primary sewage treatment is an acceptable alternative over secondary treatment. The present regime for LBAs hardly contains quality objectives.¹¹⁹ Several instruments recognize the desirability of developing quality objectives¹²⁰ or water quality criteria¹²¹ for protecting the marine environment from LBAs, but as yet, hampered by scientific uncertainties,¹²² such standards are few and far between. Sparse exceptions can be found in the European Community.¹²³ For the northeast Atlantic region, states have agreed, in legally nonbinding documents, that discharges of all hazardous substances should be reduced to "levels that are not harmful to man or nature before the year 2000."¹²⁴ Theoretically, realization of this objective before the year 2000 would require a series of progressively demanding BAT standards. If these BAT standards turn out to be inadequate, feasibility tests would have to be adjusted and cost considerations reduced.¹²⁵ It seems unlikely, however, that this standard would be sufficiently specific to serve as an actual benchmark for BAT standards. It is not without reason that the treaties on LBAs do not express legally binding objectives that could fulfill that role.

The idea of basing BAT standards on cost-oblivious benchmarks nonetheless may work for particular substances or sources. One example is the aim to achieve zero discharge of organohalogen compounds into the marine environment. The 1992 North-East Atlantic Convention obliges contracting parties to draw up plans for the "reduction and phasing out" of substances arising from land-based sources that are toxic, persistent, and liable to bioaccumulate.¹²⁶ The 1992 Ministerial Declaration on the North-East Atlantic region adds that, as a matter of priority, organohalogen substances that could reach the environment should be eliminated.¹²⁷ Similar objectives are considered in other regions¹²⁸ and at the global level.¹²⁹ Achievement of such objectives will require a series of progressively demanding BAT and BEP standards and an upgrade of such standards if these turn out to be inadequate.

The 1982 Convention requires that protection of marine ecosystems from LBAs equally applies to all states. Differentiation of that objective is unwarranted. Proper development and implementation of BAT and BEP standards require formulation of quality objectives where appropriate (in the form of zero-tolerance levels) that are to function as benchmarks for these standards. This idea has gained ground in practice: Whether governments will, in practice, subordinate their preference for disparate standards to this overall and common objective is something that can be hoped for, but which state practice has so far given little reason to believe in.

Bridging Diversity

Differences in economic and technological capabilities among states complicate application of feasibility analysis at the international level. What may be required in terms of ecosystemic needs will not necessarily be feasible for all states concerned. It is therefore important that the regime for LBAs incorporate adequate procedures for reducing such differences by technological and financial cooperation so that, ultimately, similar protections for the marine ecosystem can be attained. Given differences in causes and effects of LBP, the objective cannot be total uniformity; rather, the objective should be to make it

possible for developing states to accept and implement standards, tailored to their ecological needs, which accord sufficient protection to the marine ecosystem.

The profound financial problems and technological deficiencies of developing states as regards LBAs,¹³⁰ need to be overcome by financial and technological cooperation.¹³¹ This remains a dominant element of the 1995 Global Programme of Action on LBAs,¹³² as well as of intraregional arrangements.¹³³ Such arrangements have been envisaged under the 1992 North-East Atlantic Convention.¹³⁴ An impulse may be expected from the Global Programme of Action: First, it provides for a clearinghouse to disseminate information for each source category on available practices, techniques, and technologies that can prevent, mitigate, and/or control adverse impacts;¹³⁵ second, the Global Programme of Action calls on states to improve the mobilization of resources.¹³⁶ On this point, the Global Program reaffirms the agreements set forth in Agenda 21,¹³⁷ but the Global Programme provides few new commitments and strategies for producing the resources necessary to induce developing states to adjust policies. Earlier proposals for a revolving fund for sewage treatment technologies¹³⁸ did not make it into the final draft. The Global Programme calls on the Global Environmental Facility to "fund the agreed incremental costs of activities consistent with GEF's operational strategy."¹³⁹ It gives little hope that much will change where many states have scant resources or, more accurately, have set their priorities such that no resources are left for policies to prevent LBP.

Both strategies (cooperation on technologies and practices and financial assistance) are critical to making implementation of BAT and BEP standards a realistic option both at regional and national levels. The relevance of implementing these intentions cannot be sufficiently underscored. Without them, obligations to control LBAs in developing states are not likely to be accompanied by commitment, and local capabilities for implementation will remain idle gestures. No effective implementation of serious BAT or BEP obligations affecting agricultural practices, sewage treatment, waste management, and industrial operations can realistically be expected, even when developing states can be persuaded to accept such obligations.

In more legal terms, funding and technological support will directly affect the outcome of feasibility analysis. Financial cooperation must be considered in determining what is feasible. An analogy can be drawn with U.S. law, where the standard of economic feasibility has been defined as the level of cost that industry, in combination with the federal government, "can reasonably be expected to pay."¹⁴⁰ Interregional technology cooperation, which in large part focuses on upgrading BAT and BEP standards,¹⁴¹ may have a comparable effect. For governments for which standards are otherwise infeasible, financial and technological cooperation might enhance what is feasible and thus improve the protection accorded to marine ecosystems.

The Global Programme of Action creates a framework for technological and financial cooperation that makes it essential for governments to adopt and implement BAT and BEP strategies. States and financial institutions must use that framework. Otherwise, the increasingly elaborate international regime for regulating LBAs will remain but a paper construction without practical significance.

Conclusion

The major threats to health, productivity, and biodiversity in the marine environment stem from human activities on land.¹⁴² National laws have failed to provide adequate response. If the imperatives of the 1982 Convention and Agenda 21 are to be imple-

mented, a significant transformation of the international and national regimes for LBAs must come in the next few years. This transformation should come in the form of implementing the Global Programme of Action, developing and implementing treaties and programs of action for regions as yet not covered by any international agreements, and further implementation of existing treaties. The Global Programme of Action, as well as regional treaties and programs, provide for a wide variety of alternative strategies, including monitoring, economic instruments, consciousness-raising, and capability building that urgently need to be pursued.

This article has assessed what has become the dominant substantive strategy to that end: The development and implementation of best available techniques and best environmental practices. The policy theory underlying these strategies is sound. Industrial, agricultural, and other policies need to be adjusted to curb the threats from LBAs to the marine environment. Some technologies and practices are better than others in realizing that goal, and these are the technologies and practices that should be applied, but international law has had difficulty imposing them on states. While in several regions the main elements of a regulatory strategy based on BATs and BEPs have been identified, gaps remain in the law. However, these gaps are insignificant compared to the lack of commitment by governments to accept obligations that are sufficiently responsive to the need for protecting the marine ecosystem.

Several conclusions can be drawn that are relevant to the further development and implementation of these obligations. First, taken alone, BAT and BEP standards only restrict the discretion of states to a limited extent. The degree of protection will depend on how effectively international institutions implement their mandates under these obligations.

Second, under presently prescribed feasibility tests, institutions can and arguably should go beyond prevailing techniques and practices and proceed toward prevention of pollution. No indications, however, suggest that they actually will do so.

Third, adequate use of feasibility analysis, mandated, for instance, by the 1992 North-East Atlantic Convention, requires that feasibility-based standards be accompanied by less cost-sensitive or even cost-oblivious standards that define "ecological bottom-lines" to be achieved by BATs and BEPs. This condition also paves the way for adjusting feasibility-based standards to local economic and ecological conditions. There is no practice where such standards have been set, let alone where the adequacy of BAT or BEP standards has been assessed against such standards.

Fourth, international law requires that economic and ecological differences between states be taken into account in developing feasibility-based standards. The practice of defining standards for small and very homogenous groups of states is politically and economically understandable. Still, these factors will, in many cases, not correspond to requirements of effective protection of the marine ecosystem. Adequate use of compliance delays and technological and financial cooperation can make feasible what may once have appeared as infeasible.

Fifth, comparison with the possibilities and limitations of feasibility analysis as implemented in national law has revealed some limitations to international feasibility analysis. International institutions are poorly equipped and organized for certain key tasks that, in national law, have proven to be inherent in feasibility analysis. They do not have institutional capabilities for gathering massive amounts of information and determining complex scientific and economic issues regarding the appropriateness and feasibility of control measures that apply to heterogeneous states.¹⁴³ Neither do they have the mandate or the capabilities to exercise effective supervision over the policy choices made in determining

what is feasible, not only by individual states but also by institutions. Illustrative are the experiences of the OSPAR Commission, the most experienced regional institution dealing with LBAs. With the growth in the quantity of BAT and BEP standards, the OSPAR Commission is increasingly focusing on compliance levels by contracting parties. This has proven to be a daunting task. For instance, in 1994 the Working Group on Industrial Sectors was unable to assess compliance with a long list of recommendations "because of the nature and the complexity of the requirements."¹⁴⁴ The commission also has available a formal compliance procedure under Article 23 of the 1992 North-East Atlantic Convention, but there are no indications that states party are willing to implement it.

These differences between feasibility analysis in international and national law point to an important lesson of more general relevance now that international environmental law increasingly adopts concepts from national environmental law. Put simply, substantive international law can not develop as the national laws it aims to copy, unless it is accompanied by a corresponding growth of institutional capabilities and political will.

Notes

1. Most treaties referred to in this article confine themselves to regulating land-based pollution (LBP). It is now widely accepted that LBP is part of a wider problem of marine degradation from LBAs; see Agenda 21, *Report of the United Nations Conference on Environment and Development*, paras. 17.24-17.29, U.N. Doc. A/CONF.151/26, Annex II (1992) (covering LBP and LBAs as interconnected problems under the heading "prevention, reduction and control of degradation of the marine environment from land-based activities"). The use of the terms LBA and LBP in the present regime is inconsistent and confusing; this article will use the broader concept of LBAs unless it explicitly refers to pollution from land-based activities.

2. Joint Group of Experts on the Scientific Aspects of Marine Pollution [hereinafter GESAMP], *The State of the Marine Environment*, Rep. Stud. GESAMP No. 39 (1990), para. 363 (noting that according to a "very rough estimate" runoff and land-based discharges are held accountable for 44 percent and the atmosphere for 33 percent of marine pollution).

3. *Id.*, paras. 13-21.

4. *Id.*, paras. 217-296.

5. Preliminary Estimate of the Costs Associated with the Protection of the Mediterranean Sea Against Pollution from Land-Based Sources and Activities in Coastal Areas, Annex 2 of the *Report of the Meeting of Government-Designated Experts to Formulate a Draft Strategy for the Reduction of the Degradation of the Marine Environment from Land-Based Sources of Pollution and Activities in Coastal Areas*, U.N. Doc. UNEP(OCA/PAC)/WG.14/3 (1991) [hereinafter 1991 Meeting of Experts on Draft Strategy on LBAs].

6. Cf. 1991 Meeting of Experts on Draft Strategy on LBAs, *supra* note 5, at 11, para. 2.20 (identifying as the major reason underlying the inadequate control of pollution from LBAs in coastal areas the "setting of priorities when allocating available resources for economic development").

7. United Nations Convention on the Law of the Sea, opened for signature December 10, 1982, 21 I.L.M. 1261 (1982) [hereinafter 1982 Convention].

8. P. Birnie and A. Boyle, *International Environmental Law* 307 (1992).

9. See discussion *infra* pp. 155-156.

10. Convention for the Protection of the Marine Environment of the North-East Atlantic, September 22, 1992, 32 I.L.M. 1069 (1993) [hereinafter 1992 North-East Atlantic Convention]. After its entry into force, this treaty will supersede the Convention on the Prevention of Marine Pollution from Land-Based Sources, June 4, 1974, 13 I.L.M. 352 (1974) [hereinafter 1974 North-East Atlantic Convention]. See for discussion Ellen Hey, Ton IJlstra, and André Nollkaemper, "The 1992 Paris Convention for the Protection of the North-East Atlantic: A Critical Analysis," 8 *Int'l J. Marine & Coastal L.* 1, 21-23 (1993).

11. Convention on the Protection of the Marine Environment of the Baltic Sea Area, April 9, 1992, BNA Int'l Env. Rep., Ref. File No. 35:0401 [hereinafter 1992 Baltic Sea Convention]. After its entry into force, this treaty will supersede the Convention on the Protection of the Marine Environment of the Baltic Sea Area, March 22, 1974, 13 I.L.M. 546 (1974) [hereinafter: 1974 Baltic Sea Convention]. See for discussion Peter Ehlers, "The Helsinki Convention, 1992: Improving the Baltic Sea Environment," 8 *Int'l J. Marine & Coastal L.* 191, 197-199 (1993).

12. Protocol on Protection of the Black Sea Marine Environment Against Pollution from Land-Based Sources, April 21, 1992, 32 I.L.M. 1122 (1993) [hereinafter Black Sea Protocol].

13. Protocol for the Protection of the Marine Environment Against Pollution from Land-Based Sources, February 21, 1990 [on file with author].

14. A protocol is scheduled for adoption in 1996; see most recently: Report of the Second Meeting of Experts on Land-Based Sources of Marine Pollution in the Wider Caribbean Region, U.N. Doc. UNEP(OCA)/CAR WG.4/5 (1994) [hereinafter 1994 Experts Meeting Caribbean].

15. Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities, November 3, 1995, Washington D.C. At the time of this writing, the final version of the Programme was not published. References in this article are to U.N. Doc. UNEP(OCA)/LBA/IG.2/L.3/Add.1-Add.3 of November 1, 1995 [hereinafter Global Programme of Action]. The Global Programme of Action was developed following Decision 17/20 of the UNEP Governing Council that initiated, pursuant to para. 17.26 of Agenda 21, the preparatory process for this meeting, U.N. Doc. UNEP/GC.17/L.21/Add.2 (1993). The first two preparatory meetings are reported in: *Report of the Preliminary Meeting of Experts to Assess the Effectiveness of Regional Seas Agreements*, U.N. Doc. UNEP/LBS/WG.1/1/L.3 (1993) [hereinafter 1993 Meeting of Experts on Regional Seas Agreements]; and *Report of the Meeting of the Government Designated Experts Focusing on the 1985 Montreal Guidelines for the Protection of the Marine Environment from Land-Based Sources of Marine Pollution*, U.N. Doc. UNEP/MG/IG/1/5 (1994) [hereinafter 1994 Meeting of Experts on the Montreal Guidelines]. The preparations build on experts' meetings convened before the United Nations Conference on Environment and Development (UNCED); see *Report of the Halifax Intergovernmental Meeting of Experts*, U.N. Doc. A/CONF.151/PC/71 [hereinafter 1991 Halifax Meeting of Experts]; and 1991 Meeting of Experts on Draft Strategy on LBAs, *supra* note 5.

16. Montreal Guidelines for the Protection of the Marine Environment Against Pollution from Land-Based Sources, adopted by UNEP Governing Council Decision 13/18 on Environmental Law, U.N. Doc. UNEP/GC.13/16 (1985). The Guidelines are discussed by Meng Qing-nan, *Land-Based Marine Pollution: International Law Development* (1987). The Montreal Guidelines impose few barriers: They are recommendatory only and in terms of substance do not reflect present day concerns; see the criticism on the Guidelines throughout the 1994 Meeting of Experts on the Montreal Guidelines, *supra* note 15.

17. See *infra* pp. 156-157.

18. The article will mostly refer to the Clean Water Act, 33 U.S.C.A. § 1251 et seq. [hereinafter CWA], as this is the act most directly relevant to LBAs. Since there is a close similarity between the key elements of the CWA and those of the Clean Air Act, 42 U.S.C.A. § 7401 et seq. [hereinafter CAA], wherever relevant also this latter act will be referred to. See William H. Rodgers, Jr., *Environmental Law* 125 (1994) (referring to the cross-fertilization between these two acts and noting that terms, concepts, and procedures borrowed from one field are applied to the other).

19. Although several other states, particularly in western Europe, have adopted similar standards, the long history of these concepts in U.S. law makes this an appropriate frame of reference. Also, on other issues U.S. environmental law has had significant influence on international environmental law; see J. Bonine, "A Voice from the Wilderness, Calling Your Name," 6 *Yale J. on Reg.* 393 (1989) (referring to regulatory approaches for, i.e., protected areas, environmental impact assessment and freedom of information); Richard B. Stewart, "International Trade and Environment: Lessons from the Federal Experience," 49 *Wash. & Lee L. Rev.* 1329 (1992) (discussing U.S. law as an example for the international trade regime).

20. See H. Lauterpacht, *Private Law Sources and Analogies of International Law* 302 (1927)

(noting that in elucidating the juridical meaning of a declared common intention of the parties, the accepted juridical meaning of the term used in a treaty cannot be ignored: "Whenever in a treaty a generally accepted term of private law is being used, the interpretation and construction of the treaty must, unless the contrary is stipulated in the treaty itself, follow the principles generally recognized as implied in this particular term. The acceptance of the view that a conception of private law when used in a treaty loses its usual meaning, would deprive international law of an important source of development and of a working rule of interpretation"). This view applies equally to concepts derived from administrative law.

21. See *infra* pp. 161-162.

22. 1982 Convention, *supra* note 7, art. 194(1). See for a early comparable formulation Principle 7 of the 1972 Stockholm Declaration.

23. 1992 North-East Atlantic Convention, *supra* note 10, art. 2(1)(a) (emphasis added). Comparable obligations are contained in, e.g., art. 7 of the Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region, March 23, 1981, reprinted in 2 *The Marine Mammal Commission Compendium of Selected Treaties, International Agreements, and Other Relevant Documents on Marine Resources, Wildlife, and the Environment* 2213 (1993) 2 [hereinafter *Marine Mammal Commission*]; and art. VI of the Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment, February 14, 1982, reprinted in *Marine Mammal Commission*, *supra*, at 2282.

24. Cf. Daniel B. Magraw, "Legal Treatment of Developing Countries: Differential, Contextual, and Absolute Norms," 1 *Colo. J. Int'l Envtl. L. & Pol'y* 69, 74 (1990) (noting that the indeterminacy of contextual norms is not infinite: "A contextual norm specifies the terms for discourse about the issue to which it applies and provides some bounds of acceptable behavior").

25. See, for a conceptualization of this term, Magraw, *supra* note 24, at 74-76.

26. See with respect to art. 194(1) of the 1982 Convention: 4 *The 1982 United Nations Convention on the Law of the Sea: A Commentary*, para. 194.10(b), para. 6.4 (Myron H. Nordquist ed., 1990).

27. Respectively arts. 2(1)(a) and 3(1).

28. Although the ordinary meaning of "appropriate" suggests a different meaning than "possible," it has been interpreted as meaning that states are to take measures that are reasonable in view of their circumstances and of which they are capable, financially and technologically; see Rep. of the ILC on the Work of Its 42nd Session, GAOR, 45th Sess., Supp. No. 10, at 170-72, U.N. Doc. A/45/10 (1990). But see Simon Lyster, *International Wildlife Law* 59-60 (1985) (noting that the term "appropriate" leaves only discretion as regards the means by which states carry out their duties).

29. André Nollkaemper, *The Legal Regime for Transboundary Water Pollution: Between Discretion and Constraint* 273, 279 (1993).

30. 1991 Meeting of Experts on Draft Strategy on LBAs, *supra* note 5, at 21, para. 4.17.

31. Art. 5 of the Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-Based Sources, May 17, 1980, 19 I.L.M. 869 (1980) [hereinafter *Mediterranean Sea Protocol*].

32. See D. Taylor, G. Diprose, and M. Duffy, "EC Environmental Policy and the Control of Water Pollution: The Implementation of Directive 76/464 in Perspective," 24 *J. Common Market Stud.* 225, 240 (1986) ("Since no definition is ever given as to what level of persistence, toxicity or accumulation is required, it is possible, depending on one's point of view, to exclude or include in the 'black list' the vast majority of known chemicals").

33. See for the northeast Atlantic: Marc Pallemerts, "The North Sea Ministerial Declarations from Bremen to the Hague: Does the Process Generate Any Substance?," 7 *Int'l J. Estuarine & Coastal L.* 1, 5 (1992); Nollkaemper, *supra* note 29, at 114-16.

34. The concept of BATs already figured in older instruments as one of the standards to be taken into account in setting emission standards for hazardous substances; see art. 5(2) of the 1976 Rhine Chemical Pollution Convention, 16 I.L.M. 242 (1976); art. 6(1) of Directive 76/464. However, in view of the limited number of hazardous substances for which emission standards have been established, the practical role of the concept of BATs remained limited.

35. 1992 North-East Atlantic Convention, *supra* note 10, art. 2(3)(a) and art. 1 of Annex I. The use of BATs was foreshadowed in the Ministerial Declarations of the International Conferences on the Protection of the North Sea, 1984, 1987, and 1990, reprinted in *The North Sea: Basic Legal Documents on Regional Environmental Co-operation* 3, 40, 61 (David Freestone and Ton IJlstra eds., 1991).

36. 1992 Baltic Sea Convention, *supra* note 11, art. 3(3).

37. Even in regions where point sources have relatively effectively been brought under control, such as those along the Rhine that eventually are responsible for pollution of the North Sea, states could and to a large extent still can allow agricultural practices to result in nutrients and toxic and persistent pollutants having their deleterious effects on the marine ecosystem without being confined by legal controls; see *Kommunique über die 11. Ministerkonferenz zum Schutze des Rheins*, Bern, 8 December 1994, para. I.1 (noting that the objectives to reduce point discharges by 50 percent have largely been attained and that two-thirds of all priority substances no longer pose any problems) [on file with author].

38. See respectively art. 2(3)(b) and art. 1 of Annex I (1992 North-East Atlantic Convention, *supra* note 10) and Regulation 2 (8) of Annex III (1992 Baltic Sea Convention, *supra* note 11).

39. See respectively art. 2(3)(b) and art. 1 of Annex I (1992 North-East Atlantic Convention, *supra* note 10) and Regulation 2 (8) of Annex III (1992 Baltic Sea Convention, *supra* note 11).

40. Global Programme of Action, *supra* note 15, para. 26(a)(i) (referring to BAT and BEP standards as key examples of strategies that states should pursue in dealing with LBAs). Several source-specific actions provide for BAT and/or BEP standards, including those for persistent organic pollutants (para. 115(a)(i)); heavy metals (para. 126(b)(i)); oil (para. 132(b)(i)); and nutrients (138(d)(ii)). Note that only the actions with respect to persistent organic pollutants refer to regional actions; the other paras. refer to action to be taken at the national level.

41. Black Sea Protocol, *supra* note 12, art. 6(d) (prescribing reductions of pollution load from agriculture and forest areas affecting the water quality of the Black Sea).

42. 1994 Experts Meeting Caribbean, *supra* note 14, para. III.2 (recommending that the protocol "should promote the application of best management practices for point and nonpoint sources of pollution, and promote available technologies for point sources that are the most effective and appropriate").

43. Agenda 21, *supra* note 1, para. 17.25(c).

44. See for the regulatory developments on LBAs in these regions, André Nollkaemper, "Marine Pollution: Land-Based Pollution (Rivers/Air)," 2 *Y.B. Int'l Envtl. L.* 132 (1991); 3 *Y.B. Int'l Envtl. L.* 248 (1992); 4 *Y.B. Int'l Envtl. L.* 161 (1993); 5 *Y.B. Int'l Envtl. L.* (forthcoming 1994).

45. LBAs in this region are now only covered by the general obligation of art. VI of the Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment, *supra* note 23.

46. LBP in this region is now only covered by the general obligation of art. 7 of the Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region, *supra* note 23.

47. See 1993 Meeting of Experts on Regional Seas Agreements, *supra* note 15, paras. 71(c) and 74(n) (recommending that the parts of Agenda 21 relating to BATs should be "applied in order to assist regional groups in the development and implementation of action plans" on LBAs).

48. 33 U.S.C.A. § 1251(a)(1).

49. 33 U.S.C.A. § 1311(a). Also, more specific obligations forbid consideration of costs. In setting effluent limitations for toxins (33 U.S.C.A. § 1317(a)(2)), the EPA is not required to consider costs and technological feasibility. Congress considered discharges of toxic pollutants too dangerous to be permitted on economic grounds; see *Hercules Inc. v. EPA*, 598 F.2d 91, 111-112 (D.C. Cir. 1978).

50. This concept is taken from William H. Rodgers, Jr., "Benefits, Costs and Risks: Oversight of Health and Environmental Decisionmaking," 4 *Harv. Envtl. L. Rev.* 191, 201-202 (1980).

51. 33 U.S.C.A. § 1251(a)(2).

52. Rodgers, *supra* note 18, at 350.

53. 33 U.S.C.A. § 1313. Economic and technological infeasibility are not a valid reason for not meeting water quality standards set by states: 33 U.S.C. § 1311(b)(1)(C). See *Ackels v. U.S. EPA* (9th Cir. 1993), 24 *Envtl. L. Rep.* 20032, 20034 (1994).

54. Robert V. Percival, Alan S. Miller, Christopher H. Schroeder, and James P. Leape, *Environmental Regulation: Law, Science and Policy* 570 (1992). Cf. Frank B. Cross, *Environmentally Induced Cancer and the Law: Risks, Regulation and Victim Compensation* 91 (1989) (noting that only when a proposed regulation imposes extraordinary costs that would close down an entire industry the proposal would violate the test of feasibility analysis). Cf. *American Textile Mfrs. Inst. v. Donovan*, 452 U.S. 490, 509 (noting in the context of occupational health legislation that Congress itself defined the basic relationship between costs and benefits by placing the benefit of worker protection above all other considerations save those making attainment of the "benefit" unachievable, and that, thus, "cost-benefit analysis is not required by the statute because feasibility analysis (. . .) is"; see also *National Grain and Feed Ass'n v. OSHA*, 866 F.2d 717, 737 (5th Cir. 1989).

55. Daniel A. Farber, "Risk Regulation in Perspective: Reverse Mining Revisited," 21 *Envtl. L.* 1321, 1340-1341 (1991).

56. 33 U.S.C.A. § 1311(b)(2). See *Rybachek v. U.S. EPA*, 904 F.2d 1276, 1291 (9th Cir. 1990); *American Iron & Steel Inst. v. EPA*, 526 F.2d 1027, 1052 n. 51 (3rd Cir. 1975).

57. *Chemical Mfrs. Ass'n v. U.S. EPA*, 870 F.2d 177, 250 (5th Cir. 1989); *Rybachek v. U.S. EPA*, 904 F.2d 1276, 1290 (9th Cir. 1990).

58. *Chemical Mfrs. Ass'n v. U.S. EPA*, 870 F.2d 177, 250 (5th Cir. 1989).

59. See *Natural Resources Defense Council v. EPA*, 915 F.2d 1314, 1316 (9th Cir. 1990) (noting that the CWA banned only discharges from point sources, presumably because they could be identified and regulated more easily than nonpoint sources). As a result, reduction of discharges of pollutants from point sources has been "offset, indeed overwhelmed by a bewildering range of nonpoint source pollution: from farms, hill sides, construction sites, streets and shopping centers"; see Oliver A. Houck, "Ending the War: A Strategy to Save America's Coastal Zone," 47 *Md. L. Rev.* 358, 375 (1988). See also Robert L. Glicksman, "Pollution of the Federal Lands II: Water Pollution Law," 12 *UCLA J. Env'tl. L. & Pol'y* 61, 72 (1993).

60. The CWA aims to induce states to develop management programs to reduce pollution loads from nonpoint sources; 33 U.S.C.A. § 1329(b)(2)(A). BMPs also figure prominently in the Coastal Zone Act Reauthorization Amendments of 1990 (§ 6217, Pub. L. No. 101-508, codified at 16 U.S.C. § 1455(b)), which are to enhance local efforts to manage land-use activities that degrade coastal waters and habitats; see U.S. Department of Commerce and U.S. Environmental Protection Agency, *Coastal Nonpoint Pollution Control Program: Program Development and Approved Guidance 1* (1993) [hereinafter *Coastal Nonpoint Pollution Control Program*].

61. § 6217(g)(5) of the Coastal Zone Act Reauthorization Amendments of 1990.

62. *Coastal Nonpoint Pollution Control Program*, *supra* note 60, at 19-20.

63. Debra S. Knopman and Richard A. Smith, "20 Years of the Clean Water Act," 35 *Environment* 16 (1993).

64. Zygmunt J. B. Plater, Robert H. Abrams, and William Goldfarb, *Environmental Law and Policy: A Coursebook on Nature, Law and Society* 954 (1992).

65. See for continuing nutrient problems in the North Sea: North Sea Task Force, *North Sea Quality Status Report 1993*, at 117, para. 5.2. Ireland, Portugal, and Spain do not consider nutrients to be a problem in their territorial waters; see *Summary Record of the Sixteenth Joint Meeting of the Oslo and Paris Commissions Annex 12*, Doc. OSPAR 16/13/1-E (1994), para. 3.52 [hereinafter *Sixteenth Meeting Oslo and Paris Commissions*].

66. See 1994 Experts Meeting Caribbean, *supra* note 14, Annex IV, at 5 (noting that water quality standards should provide "ample opportunity to take into account local and site-specific ecological, geographical and physical characteristics of the marine environment").

67. See Daniel B. Magraw, "Legal Treatment of Developing Countries: Differential, Contextual, and Absolute Norms," 1 *Colo. J. Int'l Env'tl. L. & Pol'y* 69, 73 (1990) (arguing that

international environmental law should be fashioned to take into account in appropriate situations the specific capabilities and needs of developing countries).

68. 1982 Convention, *supra* note 7, art. 207(5).

69. Principle 11 of the 1992 Rio Declaration, 31 I.L.M. 874 (1992). See also Principle 23 of the 1972 Stockholm Declaration; art. 130(3) of the Treaty on the European Community.

70. Washington Declaration on Protection of the Marine Environment from Land-Based Activities, November 3, 1995, U.N. Doc. UNEP(OCA)/LBA/IG.2/L.4 (Declaration adopted upon signature of the Global Programme of Action), 6th preambular para. (stating that differences in environmental, economic and social conditions will lead to different judgments and priorities in addressing priorities related to the degradation of the marine environment by LBAs). Cf. UNEP Governing Council Decision 17/20, U.N. Doc. UNEP/GC.17/L.21/Add.2 (calling on the preparatory process for the 1995 Washington Conference to identify approaches for addressing LBAs that are tailored to particular economic and geographic circumstances). See generally on differentiated standards: Magraw, *supra* note 24, at 73-74.

71. Thomas O. McGarity, "Media-Quality, Technology, and Cost-Benefit Balancing Strategies for Health and Environmental Regulations," 46 *Law & Contemp. Probs.* 159, 160 (1983); Bruce A. Ackerman and Richard B. Stewart, "Reforming Environmental Law," 37 *Stan. L. Rev.* 1333 (1985).

72. Remarks Weber, Int'l L. Ass'n, *Rep. of the Sixty-Third Conference* 234 (1988) (making a similar observation in the context of long-distance air pollution). Cf. Derek Ellis, "The Precautionary Principle: A Taxpayers' Revolt," 26 *Marine Pollution Bull.* 170 (1993) (arguing that a proposal to apply BATs (secondary treatment) to sewage treatment in Victoria, British Columbia, would provide very little environmental benefit for their cost; it would impose ridiculous amounts for what is environmentally unnecessary). Also, in the United States this prospect has led to criticism on uniform technological standards. As Currie notes with respect to BAT standards under the CAA, no provision of the CAA "recognizes the unpleasant possibility that the elimination of the last vestige of harm due to pollution may never be worth the cost." David Currie, *Air Pollution: Federal Law and Analysis* § 4.12 (1981). Illustrative is the criticism of the American Forest and Paper Association to the proposed EPA rule for the paper and pulp industry that would lead to the close-down of 30 mills, idling thousands of mill workers, and possibly causing the loss of 250,000 related jobs, and the rule would cost much more money than is necessary to protect the environment. *Canadian Papermaker*, January 1994.

73. Birnie and Boyle, *supra* note 8, at 317-318. See also J. A. de Yturriaga, "Regional Conventions on the Protection of the Marine Environment," 162 *Recueil des Cours* (Hague Academy of International Law, 1979-I); Dominique Alhritire, "Marine Pollution Control Regulation: Regional Approaches," *Marine Pol'y* 162 (1982).

74. Cf. Harold W. Wood, "The United Nations' World Charter for Nature—The Developing Nation's Initiative to Establish Protection for the Environment," 12 *Ecology L. Q.* 977, 986 (1985) (referring to Brazil's position that a worldwide obligation to apply BATs would make developing countries indefinitely dependent upon technologies of developing countries).

75. See *A Programme of Action for the Protection of the Marine Environment from Land-Based Activities: Preliminary Views of the Nordic Countries on Scope and Content*, informal paper submitted to the 1994 Meeting of Experts on the Montreal Guidelines, *supra* note 15 [on file with author]. Cf. 1993 Meeting of Experts on Regional Seas Agreements, *supra* note 15, para. 74(m) (recognizing that there are likely to be some marine problems with land-based sources which cannot be dealt with effectively by national or regional action). See also Global Environmental Facility, Scope and Preliminary Operational Strategy for International Waters, Doc. GEF/C.3/7 (1995), para. 5 (noting that transboundary water problems involve so many nations and so many sectoral interests that solutions to regional conflicts must come not only from country-driven commitments for action but also from coordinated, global commitment and involvement) [hereinafter GEF]. See also *id.* at 12-13 (referring to use of best practices or clean technology to reduce emission deposits of toxic pollutants on the global level).

76. But see Alhritire, *supra* note 73, at 172 (noting that the definition of regions in

regional seas agreements has been more induced by political considerations than geographical ones).

77. Art. 24 is a formalization of a procedural arrangement adopted by the commission in 1988 that sought to facilitate the introduction into the commission of more ambitious targets adopted by the International North Sea Conferences, while allowing parties in different regions and with different circumstances to introduce different measures and time frames to attain that goal; see Hey, IJlstra, and Nollkaemper, *supra* note 10, at 40-42.

78. But see PARCOM Decision 92/3 on the Phasing-out of PCBs and Hazardous PCB Substitutes (allowing the North Sea states and Iceland 7 years and all other parties 13 years to phase out and destroy PCBs).

79. 1994 Experts Meeting Caribbean, *supra* note 14, at 7; *id.* Annex IV, at 7 (noting that BATs and BEPs should be defined with timetables for implementation adjusted to the economic and technological capacity of each country).

80. 18 BNA Int'l Env'tl. Rep., 491 (1995).

81. 1992 North-East Atlantic Convention, *supra* note 10, Appendix 1, para. 2 (emphasis added).

82. *Id.* (emphasis added).

83. Economic feasibility can be considered to cover also technological feasibility (sub (a) and (b)), since what is technologically feasible depends largely on what one is willing to pay for it; see Peter Huber, "The Old-New Division in Risk Regulation," 69 *Va. L. Rev.* 1025, 1061 (1983).

84. 1992 North-East Atlantic Convention, *supra* note 10, Appendix 1, para. 6.

85. *Id.*, para. 7.

86. *Id.*, para. 6.

87. *Id.*, art. 1(1) of Annex I.

88. Nollkaemper, *supra* note 29, ch. 6.

89. Art. 10(2)(c) *jo* 2(3)(b).

90. See *Weyerhaeuser Co. v. Costle*, 590 F.2d 1011, 1042 (D.C. Cir. 1978). It is this argument that led to the constitutional authority of Congress to regulate all waters in the United States; see *United States v. Ashland Oil & Transportation Co.*, 504 F.2d 1317, 1328 (6th Cir. 1974); *United States v. Earth Sciences Inc.*, 599 F.2d 368, 373-375 (10th Cir. 1979). See also Richard B. Stewart, "Pyramids of Sacrifice? Problems of Federalism in Mandating State Implementation of National Environmental Policy," 86 *Yale L. J.* 1196, 1222 *et seq.* (1976-77) (noting that Congress could impose stringent environmental controls in all states in order to eliminate the actual or potential disadvantage enjoyed by firms with low controls over firms in states that have stringent controls); see also Daniel C. Esty, *Greening the GATT: Trade, Environment and the Future* 22 (1994) (noting that interstate competition for sites with lax environmental standards contributed significantly to the drive for national environmental standards in the United States in the late 1960s and 1970s).

91. Arts. 194(1) and 207(1) of the 1982 Convention, *supra* note 7, oblige states to endeavor to harmonize their policies on LBP at the appropriate regional level. See also 1993 Meeting of Experts on Regional Seas Agreements, *supra* note 15, para. 100 (recommending to avoid attracting foreign investment through less strict restrictions).

92. If feasibility were to be interpreted restrictively, states might justify outmoded control technology simply because their industry is marginally profitable and cannot afford more sophisticated devices. Few controls may then be economically feasible and few emission reductions will be realized. Cross, *supra* note 54, at 93 (applying a similar reasoning to U.S. law). The legal effect would be "to insulate from strict regulation industries that had not even attempted to develop effective prevention measures in the past"; see Howard A. Latin, "The Feasibility of Occupational Health Standards: An Essay on Legal Decision-Making under Certainty," 78 *NW. U. L. Rev.* 583, 612 (1983).

93. 2 William H. Rodgers, Jr. *Environmental Law* § 4.233 (1986) (noting that, compared to best practical technology standards, the BAT standard is more demanding, depending less on

actual use and relying more on prediction and guesses and development of transfer of technology). U.S. Courts consistently have held that plant closures and job losses did not necessarily lead to a standard being economically unachievable. See *American Iron & Steel Inst. v. EPA*, 526 F.2d 1027, 1054 (3rd Cir. 1975) (sanctioning a 14 percent closure rate for steel plants in the iron and steel industry); *Ford Motor Co. v. EPA*, 718 F.2d 55, 58 (3rd Cir. 1983) (accepting an employment disruption for an estimated 5400 persons in the metal finishing industry); *Weyerhaeuser Co. v. Costle*, 590 F.2d 1011, 1047 (D.C. Cir. 1978) (accepting a loss of 1800 jobs or 1.5 percent of total employment). These references are taken from *Chemical Mfrs. Ass'n v. U.S. EPA*, 870 F.2d 177, 252 n. 337 (5th Cir. 1989). Congress explicitly recognized that achieving the CWA's goal of eliminating all discharges would cause "some disruption in our economy including plant closures and job losses." *Chemical Mfrs. Ass'n v. U.S. EPA*, 870 F.2d 177, 252 (5th Cir. 1989). The same holds for BPT standards, which could require "a substantial number of point sources with the poorest performances either to conform to the BPT standards or to cease production"; see *EPA v. National Crushed Stone Ass'n*, 449 U.S. 64, 76. Congress anticipated that initially BPT might cause many plant closures and the loss of 50,000 to 125,000 jobs; see *Chemical Mfrs. Ass'n v. U.S. EPA*, 870 F.2d at 205.

94. Cf. Harald Hohmann, *Präventive Rechtspflichten und -Prinzipien des Modernen Umweltvölkerrechts: Zum Stand des Umweltvölkerrechts Zwischen Umweltnutzung und Umweltschutz* 170 (1992) (noting that developed regions can be expected to apply the advanced technologies available on the world market). The Netherlands has argued that the fact that a particular technique is only available outside Europe would not imply that it does not have to be applied by the riparian states of the Rhine; see Explanatory Memorandum to the Act of Approval of the 1976 Rhine Chemical Pollution Convention, Tweede Kamer, 1977/78, 14 663, Nos. 1-7, at 18.

95. 1992 North-East Atlantic Convention, *supra* note 10, art. 1 of Annex I and art. 2(3)(b).

96. The Seventh Meeting of the contracting parties to the 1980 Mediterranean Sea Protocol agreed to facilitate access to, and transfer of, clean production methods. In the 1993 Ministerial Declaration on the Black Sea, the ministers decided to further, where appropriate, the use of low and non-waste technologies to achieve a reduction of inputs of harmful substances. See generally R. Michael M'Gonigle, "'Developing Sustainability' and the Emerging Norms of International Environmental Law: The Case of Land-Based Marine Pollution," 28 *Can. Y.B. Int'l L.* 171 (1990).

97. See paras. 26(a)(i)(B) and 50(d) of the Global Programme of Action, *supra* note 15; para. 17.25(d) of Agenda 21, *supra* note 1 (stipulating that states should cooperate to develop means of providing guidance on technologies to deal with LBP); 1993 Meeting of Experts on Regional Seas Agreements, *supra* note 15, para. 87(c) (recommending the promotion of cleaner production); para. 18 and recommendation 39 of the 1991 Halifax Meeting of Experts, *supra* note 15 (stating that clean production is "the way to proceed"); 1991 Meeting of the Experts on Draft Strategy on LBAs, *supra* note 15, para. 3.11.

98. 1992 North-East Atlantic Convention, *supra* note 10, art. 13.

99. Latin, *supra* note 92, at 586-88, 611-12 (discussing this issue in the context of domestic law).

100. If technology-forcing standards turn out to be unachievable, they will not only fail to achieve the envisaged degree of protection of the marine ecosystem, but they also may lead to an economic waste and consume resources that cannot be directed at other sources of LBP. Latin, *supra* note 92, at 618, 620.

101. See in general on procedural requirements for adequate pre-enforcement determination of feasibility-based standards: Latin, *supra* note 92.

102. "Certainty" may, for instance, be derived from findings that firms in other states already comply with standards; whether technology can be transferred from one industry to another or from one state to another; that experimental technology will become practicable during the implementation period of the standard; or that technology-forcing incentives together with an extended compliance schedule may eventually enable an industry to meet standards. In *United Steelworkers of America v. Marshall*, 647 F.2d 1189, 1278 (D.C. Cir. 1980), the "extremely remote deadline" was considered as "perhaps the single most important factor supporting the feasibility of the standard."

103. See 1993 Meeting of Experts on Regional Seas Agreements, *supra* note 15, para. 87(c) (recommending promotion of cleaner production and cooperation with industry). The 1992 North-East Atlantic Convention, *supra* note 10, has formalized the practice of admitting representatives from industrial sectors as observers to the meetings of the OSPAR Commission; see art. 11.

104. See for a listing of these and other recommendations and decisions of regional bodies, Nollkaemper, *supra* note 44.

105. Nollkaemper, *supra* note 29, ch. 5.

106. Art. 13 of the 1992 North-East Atlantic Convention, *supra* note 10.

107. See e.g. PARCOM Recommendation 94/7 on the Elaboration of National Action Plans and Best Environmental Practices (BEP) for the Reduction of Inputs to the Environment of Pesticides from Agricultural Use, *Sixteenth Meeting Oslo and Paris Commissions*, *supra* note 65, Annex 12, which confines itself to mentioning all possibilities to address pesticides without mandating any particular action.

108. Cf. Houck, *supra* note 59, at 377 (noting that measures to control nonpoint pollution from agricultural sources are well known and, by contrast to municipal and industrial controls, are relatively cheap).

109. *Id.* at 359.

110. Note that this undermines the harmonization of standards, one of the key rationales of the development of international standards. See *supra* notes 89–91 and accompanying text. If even in the European Community BAT standards are not harmonized for that reason, and claims for ecological and climatologic variations dominate, for all practical purposes in the regime for LBAs the competitiveness will not drive towards uniformity.

111. See *supra* notes 48–53 and accompanying text.

112. See e.g. *American Mining Congress v. Thomas*, 722 F.2d 617, 636 (1985) (noting that whether emission standards adopted by the EPA were the result of a permissible balancing had to be reviewed in the light of the EPA's paramount responsibility to ensure protection of the public health and safety).

113. See Christopher Martin Heimann et al., "Project: The Impact of Cost-Benefit Analysis on Federal Administrative Law," 42 *Admin. L. Rev.* 545, 550–52 (1990). See *Northwest Indian Cemetery Protective v. Peterson*, 764 F.2d 581, 588 (9th Cir. 1985) (notes that best management practices are a means to achieve the appropriate state water quality standards).

114. David Schoenbrod, "Goals Statutes or Rules Statutes: The Case of the Clean Air Act," 30 *UCLA L. Rev.* 740, 759 (1983) (notes that feasibility standards try "to use time to avoid either comprising its ideals or ignoring feasibility").

115. Art. 3(b) jot 2(1)(a) of the 1992 North-East Atlantic Convention, *supra* note 10.

116. See *supra* note 79.

117. 1992 North-East Atlantic Convention, *supra* note 10, art. 24.

118. *Id.*, Appendix 1.

119. Quality objectives do not necessarily have to be fully cost-oblivious and seemingly out of reach. They very well can reflect some cost considerations as intermediate stages to ultimate cost-obliviousness. See Taylor, Diprose and Duffy, *supra* note 32, at 236 (noting that a quality objective is "a target which may never be reached, for many reasons, or, more realistically, will take an extended period of time to achieve and may require the setting of a number of intermediate objectives to act as progress markers"). Cf. Jeffrey A. Floran and Robert W. Adler, "Cleaner Water, But Not Clean Enough," *Issues in Science and Technology*, December 22, 1993 (noting that although the water quality criteria for toxic pollutants in surface waters that the EPA has to set in theory can be set at zero, whenever necessary to protect human health or the environment, in practice, they are set well above zero, among others based on implicit assumptions about economic and technological feasibility). See also David Schoenbrod, "Goals Statutes or Rules Statutes: The Case of the Clean Air Act," 30 *UCLA L. Rev.* 740, 776 (1983) (noting that the prohibition for the EPA to consider costs in setting primary air quality standards under the CAA rests on a fiction since the absence of a threshold for pollution's health effects means that the standards must inevitably constitute a balance between health and the costs of protecting health).

120. See para. 3(c) of the 1987 International North Sea Declaration (referring to the development of quality standards for hazardous substances). 1994 Experts Meeting Caribbean, *supra* note 14, at 5 (noting that "[u]ltimately," the protocol on LBP should address ecosystem health).

121. Such standards have been proposed in the Caribbean region; in the preparations of the protocol for the Wider Caribbean region it has been accepted that "[t]here are certain minimum requirements for the quality of water used to protect human health and marine species and water used for human consumption"; and that regional water quality criteria should be established as a basis for national water quality standards; see 1994 Experts Meeting Caribbean, *supra* note 14, at 5.

122. See Sonja Boehmer-Christiansen, "Environmental Quality Objectives versus Uniform Emission Standards," in *The North Sea: Perspectives on Regional Environmental Cooperation* 139, 140-141 (David Freestone and Ton Ilstra eds., 1990) (referring to the difficulties involved in assessing pollution against quality standards); *North Sea Quality Status Report 1993*, *supra* note 65, at 117 (noting that appropriate methodology is lacking by which to assess whether contaminant concentrations in the various parts of the North Sea will have reached levels by the year 2000 that are no longer harmful to man or nature).

123. Respectively Council Directive 76/160 of 8 December 1975 Concerning the Quality of Bathing Water, O.J. 1976, L 31/1; Council Directive 78/659 of 18 July 1978 on the Quality of Fresh Water Needing Protection or Improvement in Order to Support Fish Life, O.J. 1978, L 222/1; and Council Directive 79/923 of 30 October 1979 on the Quality Required for Shellfish Waters, O.J. 1979, L 194/26.

124. Para. 1 of the 1990 International North Sea Declaration and Part III of the 1992 Ministerial Declaration on the North-East Atlantic.

125. The need to adjust feasibility tests to ecological conditions applies in particular to the case of so-called "hot spots," where pollution accumulated and "normal" standards are insufficient; see 1994 Experts Meeting Caribbean, *supra* note 14, Annex IV, at 7 (recommending that for hot spots governments are to formulate specific management plans based on water quality and environmental quality criteria, applying more appropriate measures and timetables to reduce pollution in these areas). Cf. *North Sea Quality Status Report 1993*, *supra* note 65, at 115 (noting that local concentrations do not always reflect reductions in inputs of metals and organic contaminants and that higher concentrations of lead are found in the Norwegian Trench and off the northeast coast of England).

126. 1992 North-East Atlantic Convention, *supra* note 10, art. 3 of Annex I.

127. For the northeast Atlantic several organohalogen compounds are already bound to be phased out; see e.g. PARCOM Decisions 92/4 and 93/1 on the phasing out of the use of hexachloroethane in respectively the secondary aluminum industry and the primary aluminum industry with integrated foundries and in the nonferrous metal industry. See also 1993 Meeting of Experts on Regional Seas Agreements, *supra* note 15, paras. 87(f)(i) (recommending that the use of persistent organic chemicals be minimized) and 87(1) (recommending that timetables for the elimination of pollution from hazardous substances be prepared in regions where they do not yet exist, but adding the qualifier "according to their capabilities," which makes it a cost-sensitive rather than a cost-oblivious imperative).

128. The Seventh Meeting of the Parties to the 1976 Mediterranean Sea Convention recommended that the parties reduce and phase out by the year 2000 inputs to the marine environment of listed toxic, persistent and bioaccumulative substances, in particular organohalogen compounds. See also the Recommendations of the International Joint Commission regarding pollution with persistent toxic substances of the Great Lakes, *Sixth Biennial Report on Great Lakes Water Quality* (1992); reconfirmed in the *Seventh Biennial Report on Great Lakes Water Quality* (1994).

129. See para. 17.28(d) of Agenda 21, *supra* note 1, and para. 17 of the Washington Declaration on Protection of the Marine Environment from Land-Based Activities, *supra* note 70 (calling on states to develop a global, legally binding instrument for the reduction and/or elimination of emissions, discharges and, where appropriate, the elimination of the manufacture and use of persistent organic pollutants). See also para. 97 of the Global Programme of Action, *supra* note

15. This would implement art. 207(5) of the 1992 Convention, *supra* note 7, which obliges states to "minimize, to the fullest extent possible, the release of toxic, harmful or noxious substances, especially those which are persistent, into the marine environment."

130. See for an overview of such problems in various regions André Nollkaemper, "Marine Pollution from Land-Based Sources: Towards a Global Approach," 24 *Marine Pollution Bull.* 8 (1992).

131. See e.g. art. 202 of the 1982 Convention, *supra* note 7; Recommendation 50 of the 1991 Halifax Meeting of Experts, *supra* note 15; paras. 17.23 and 17.25(c) of Agenda 21, *supra* note 1; Principle 9 of the 1992 Rio Declaration, *supra* note 69.

132. In its Decision 17/20, initiating the preparatory process for the program of action, the Governing Council of UNEP called on preparatory process to identify criteria for development assistance for the purpose of mobilizing financial resources for the protection of the marine environment from LBAs, U.N. Doc. UNEP/GC.17/L.21/Add.2. See on the possible role of the Global Environmental Facility with regard to LBAs: GEF, *supra* note 75. See for the role of GEF in the Global Programme of Action: Global Programme of Action, *supra* note 15, paras. 78-80.

133. See 1993 Meeting of Experts on Regional Seas Agreements, *supra* note 15, para. 95 (stating that the chapters of Agenda 21 relating to transfer of sound environmental technology and transfer of financial resources should be adopted by the regional seas programs); and para. 81 (stating that adequate mechanisms should be established for interregional sharing of information and experience on available techniques for pollution prevention).

134. The 1992 Ministerial Declaration on the North-East Atlantic agreed that the OSPAR Commission should act as a focal point for regional and interregional exchange on information on BATs and BEPs. Considering the implementation of this mandate, the *Sixteenth Meeting of the Oslo and Paris Commissions*, *supra* note 65, paras. 9.13-9.15, encouraged contracting parties to give financial support to developing countries, but added that any concrete projects should be set up on a bilateral basis between any contracting party and developing countries as a reaction to demand from the developing country in question.

135. Global Programme of Action, *supra* note 15, paras. 51-58.

136. *Id.*, paras. 59-80.

137. Agenda 21, *supra* note 1, para. 17.23. Para. 60 of the Global Programme of Action, *supra* note 15, acknowledges that for countries in need of assistance (a generic term meant to cover both developing countries and countries with economies in transition) new and additional funding will be required.

138. Paras. 58-62 of the draft Global Programme of Action, U.N. Doc. UNEP(OCA)/LBA/IG.2/3 of 18 August 1995 (providing for a revolving fund to generate long-term capital available for the construction and effective management of sewage management systems).

139. Global Programme of Action, *supra* note 15, para. 79.

140. *Natural Resources Defense Council v. U.S. Nuclear Reg. Comm'n*, 685 F.2d 459, 492 (D.C. Cir. 1982).

141. For the northeast Atlantic: see *supra* note 134.

142. Global Programme of Action, *supra* note 15, para. 1.

143. See Ackerman and Stewart, *supra* note 71, at 1337.

144. *Sixteenth Meeting of Oslo and Paris Commissions*, *supra* note 65. The commission discussed ways to make progress by improving and harmonizing the quality of drafting of decisions and recommendations and by issuing new guidelines for the preparation of implementation reports.