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Thomas Lundmark

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ARTICLES

Systemizing Environmental Law on a German Model

Thomas Lundmark*

Introduction

This article presents a systematic overview of environmental law in Germany, treating topics of general¹ application. The author proposes that the organizational complex of German environmental law be applied to American law to design better strategies for improving and maintaining environmental quality, as well as to

* Professor of Anglo-American Law, University of Münster, Germany. J.D., University of California, Berkeley; Dr. jur., University of Bonn, Germany. The author gratefully acknowledges the helpful comments from Professor Eileen Gauna, Southwestern School of Law, and Prof. Dr. Jörg Lücke, University of Mainz, Germany.

1. German academic texts and hornbooks typically are divided into two parts. The first part treats issues of general application, such as definitions, constitutional obligations, and enumerations of principles and instruments. The second part addresses specific subject-matter areas. For environmental law, specific subject-matter areas will include control of pollution in various resources (air, water, land) as well as protection against particular pollutants and hazardous substances. For example, the second part of a leading hornbook on environmental law has chapters discussing emissions, water-quality protection, waste disposal and hazardous substances, protection of the resources of nature, landscape, and the soil, and transborder pollution. REINER SCHMIDT & HELMUT MÜLLER, EINFÜHRUNG IN DAS UMWELTRECHT (3d ed. 1992).

quicken instruction of the subject in American law schools.² The model introduced in this article views environmental law as an integrated whole. Environmental law cannot be comprehended, or effectively utilized, simply by understanding its disjointed, component parts.

The systematization here depicted accomplishes three aims: it divines the triune object of environmental protection law, it unearths underlying public policies, and it gathers and arranges the finite number of legal techniques that are available to protect the environment. As revealed in this article, the mound of statutes, regulations, and case decisions that make up environmental law can be winnowed to definable objects, articulable policies, and manageable methods.

American texts on environmental law devote little, if any, time to defining the subject matter of environmental law; that is, what is meant by "environment." Casebooks typically do not even treat the issue.³ Instead they surrender the debate to biologists, philosophers, and omnipresent economists.⁴ As a result, legal texts and casebooks sometimes include subject-matter areas, such as the workplace "environment," that are perhaps better left to labor law and other disciplines. German introductions to the law of environmental protection, by contrast, commence with the fundamental issue of what is meant by "environment" for purposes of environmental law.⁵

2. The Dean of American environmental law professors, Joseph Sax, polled teachers of environmental law throughout the country and found that they considered their field un compelling at best. Joseph L. Sax, *Environmental Law in the Law Schools: What We Teach and How We Feel About It*, 19 ENVTL. L. REP. 10, 251 (1989).

3. See PETER S. MENELL & RICHARD B. STEWART, ENVIRONMENTAL LAW AND POLICY (1994), THOMAS J. SCHOENBAUM & RONALD H. ROSENBERG, ENVIRONMENTAL POLICY LAW (2d ed. 1991), and ROGER FINDLEY & DANIEL A. FARBER, ENVIRONMENTAL LAW (3d ed. 1991). On the failure to agree on an analytic framework to address environmental problems, see the collection of divergent views, and the authors' observations, in MENELL & STEWART at 23-160. The organizational shortcomings of SCHOENBAUM & ROSENBERG, FINDLEY & FARBER, and other environmental law texts are demonstrated in David A. Westbrook, *Liberal Environmental Jurisprudence*, 27 U.C. DAVIS L. REV., 619 *passim* (1994).

4. See SCHOENBAUM & ROSENBERG, *supra* note 3, chap. 1, entitled "Environmental Policy Perspectives," at 1-34, with subparts entitled "Ecological Perspectives," "Economic Perspectives," and "Philosophical Perspectives."

5. See SCHMIDT & MÜLLER, *supra* note 1, at XXII.

Environmental law encompasses two entangled fields: resource protection and nature protection.⁶ Resource protection refers to protection of those resources (atmosphere,⁷ water, and land)—sometimes called “media”⁸—that are essential to human survival. Nature protection means conservation of lifeforms not unreasonably injurious to humans, and conservation of landforms and landscape. Specific resource-protection measures, depending on their purpose or emphasis, may conceptually be assigned to one of two overlapping subfields. In one subfield, one finds measures aimed at minimizing or eliminating certain harmful agents (pollutants). In the other are measures fashioned to protect an essential resource from degradation. Measures in the former subfield are called *kausal* in German because they address the causes of environmental degradation.⁹ Measures in the latter subfield are *medial* because they protect the environmental “media.” And measures that directly protect flora and fauna are called *vital* because they protect life. Finally, while each particular measure is assignable to one of these three categories, any particular enactment or constellation of measures may combine one or more different measures. In this case, the statute (not the measure) is referred to as *integral*, or “integrated.”¹⁰

6. See DANIEL BARSTOW MAGRAW, *International Law and Pollution*, INTERNATIONAL LAW AND POLLUTION 1 (Daniel Barstow Magraw ed., 1988), noting that the international environmental law divides itself into two great branches: (1) allocating and conserving natural and cultural resources and (2) preventing or otherwise dealing with pollution. This division is touched on in an undergraduate course book. See CHRISTINA M. VALENTE & WILLIAM D. VALENTE, INTRODUCTION TO ENVIRONMENTAL LAW AND POLICY: PROTECTING THE ENVIRONMENT THROUGH LAW (1995) (“For the sake of discussion, environmental concerns can be roughly divided into two broad categories: pollution and natural-resource depletion.”) *Id.* at 5.

7. “Atmosphere” includes climate.

8. The author prefers the words “essential natural resource” over “medium” because the latter term conjures up a mental image of a séance. In international law texts, various resources are sometimes referred to as “sectors” of the environment; but these sectors are not necessarily the same as environmental media or essential resources. One text identifies the following as environmental sectors: oceans, inland waters, air, soil, and wildlife. ALEXANDRE KISS & DINAH SHELTON, INTERNATIONAL ENVIRONMENTAL LAW 155 (1991). KISS & SHELTON is reviewed by the author at 41 AM. J. COMP. L. 675 (1993).

9. See Wilfried Erbguth, *German Environmental Law Concepts*, in NORTH EUROPEAN ENVIRONMENTAL LAW 291, 292 (Erkki J. Hollo & Kari Marttinen eds., 1995).

10. *Id.* See also NIGEL HAIGH & FRANCES IRWIN, INTEGRATED POLLUTION CONTROL IN EUROPE AND NORTH AMERICA (1990).

To summarize, there are three regulatory objects: essential resources, pollutants, and nature. Expressed adjectivally, environmental measures are either causal, medial, or vital. Consequently, environmental law can be defined as the universe of legal measures that are primarily designed to protect essential resources from degradation, to minimize or eliminate pollution, and to conserve components of nature. Thus subdivided, the tangled forest of environmental legislation, regulations, and decisional law will, upon reflection, acquire contours and colorations that make it more comprehensible, accessible, pleasing, and employable.

In undertaking the task of environmental protection and enhancement, German law is guided by the three major, fundamental principles of environmental policy. The major policies are the precautionary policy (*Vorsorgeprinzip*), the "polluter-pays" policy (*Verursacherprinzip*), and the policy of cooperation (*Kooperationsprinzip*). None of these policies is self-executing in German law unless it happens to be codified.¹¹ None can override legislation or extend legislation to unforeseen fact situations in Germany.¹² Rather, these policies serve as guides to legislative, administrative, and sometimes judicial¹³ action.

German scholarship emphasizes the various methods or "instruments"¹⁴ to effectuate environmental goals and policies. While the class of methods available to environmental policy makers is finite, there is no consensus within German academic circles on how the various methods should be isolated, clustered, and labeled. As discussed in this treatment, the methods of environmental law are private rights, direct regulation, economic measures, voluntary programs, environmental assessment, and proprietary governmental action. All of these methods are known in American law, where they are usually referred to as "models,"¹⁵ "techniques,"¹⁶ "strate-

11. This aspect of the precautionary policy has created uncertainty in international environmental law (where it is usually called the "precautionary principle") because, standing alone, the precautionary policy is ambiguous. Lothar Gundling, *The Status in International Law of the Principle of Precautionary Action*, 5 INT'L J. ESTUARINE & COASTAL L. 23, 30 (1990).

12. See Rüdiger Breuer, *Das Umweltschutzrecht*, BESONDERES VERWALTUNGSRECHT 601 at 648 (von Münch ed., 8th ed. 1988).

13. See GERMAN ENVIRONMENTAL LAW FOR PRACTITIONERS 40-41 (Horst Schlemminger & Holger Wissel eds., 1996).

14. The author prefers the term "method" because the word "instrument" is used in public international law to mean treaties and other legal documents.

15. WILLIAM H. RODGERS, JR., ENVIRONMENTAL LAW, 53-54 (2d ed. 1994) (recognizing four "general models" of environmental statutes: technology-forcing laws; risk-assessment "balancing" laws; environmental impact assessment

gies,"¹⁷ or, most commonly, "approaches."¹⁸ Indeed, some of the methods, such as private rights and economic measures, find use more often in American than in German law. But Americans tend to gloss over the discreet, exhaustive nature of these methods, or to favor the more glamorous methods with their attention.¹⁹ Further, by insisting on teaching from case decisions,²⁰ Americans unrealistically expect that judges untrained in environmental law will remedy the "complex, messy, and disorganized" state of American law.²¹

regulation; and strict liability laws). Rodgers also discusses two other models: integrated pollution control, and economic incentives. *Id.* at 59-60.

16. On the international level, the legal "techniques" have been identified as: environmental decision-making (impact assessments, cooperation, etc.), accountability/liability, surveillance and monitoring, trade (import and export) restrictions, establishment of an organization or organ, special area management, development assistance, pollution restrictions, penalties, and education. EDITH BROWN WEISS, DANIEL BARSTOW MAGRAW, & PAUL C. SZASZ, *INTERNATIONAL ENVIRONMENTAL LAW: BASIC INSTRUMENTS AND REFERENCES*, x (1992).

17. Carol M. Rose, *Rethinking Environmental Controls: Management Strategies for Common Resources*, 1991 DUKE L.J. 1, 8 (identifying four "generic strategies": "Do-Nothing," "Keepout," "Rightway," and "Property").

18. MAGRAW, *supra* note 6, at 7-8 (wherein Professor Magraw describes three general approaches: market, remedial/compensatory, and regulatory/preventive). Professors Findley and Farber recognize four basic approaches (property rights, direct regulation, subsidies, and charges), but subsidies and charges can be grouped into Magraw's "market" approach. See ROGER W. FINDLEY & DANIEL A. FARBER, *ENVIRONMENTAL LAW IN A NUTSHELL* 89-90 (3d ed. 1992). Mr. Westbrook similarly discerns essentially the same three approaches: common law, markets, and administration. Westbrook, *supra* note 3, at 621. Indeed, of the seven methods discussed in this article, only two (voluntary measures and proprietary governmental action) do not fit comfortably into this grouping. Accordingly, at another place, the author pruned the various state legal techniques of environmental management that directly influence private forested property down to three branches: (1) prescription or regulation by statutory and common law constructs; (2) furnishing incentives or assessing charges; and (3) encouraging voluntary measures. Thomas Lundmark, *Methods of Forest Law-Making*, 22 B.C. ENVTL. AFF. L. REV. 783, 783 (1995).

19. For example, there are over 100 articles in American academic journals on environmental incentives and pollution reduction. RODGERS, *supra* note 15, at 60.

20. See FREDERICK R. ANDERSON, DANIEL R. MANDELKER, & A. DAN TARLOCK, *ENVIRONMENTAL PROTECTION: LAW AND POLICY*, xxiv (2d ed. 1990) ("Fundamentally, environmental law is a law of judicial review of agency action.")

21. The structural failings and "intellectual incoherence" of American environmental law are demonstrated in Westbrook, *supra* note 3, at 621. To Mr. Westbrook's collection of cries about the complexity of the environmental law could be added the following: "Environmental law is structurally complex." ROBERT V. PERCIVAL, ALAN S. MILLER, CHRISTOPHER H. SCHROEDER, & JAMES P. LEAPE, *ENVIRONMENTAL REGULATION LAW, SCIENCE, AND POLICY* 71 (1992).

A. *Environmental Law*

Despite having spent three decades teaching and writing about environmental law, American academics have neglected to define the purview of their discipline.²² Typical is Professor Rodgers' popular hornbook,²³ whose first chapter, entitled "Introduction to Environmental Law," packs 111 pages with graphic diagrams and frightening scenarios from what he terms "the thicket of environmental law,"²⁴ without once pausing to bring his unique experience to bear on defining the scope of his topic.²⁵ As a consequence of this oversight by academics and commentators, coverage of the literature of environmental law, disregarding certain core topics, lacks uniformity. Some environmental law texts include chapters on labor law, agriculture, land use, and health regulations.²⁶ One casebook addresses only common law remedies and statutory approaches to air pollution.²⁷ Another devotes chapters to the traditional topics of nature protection, hazardous wastes and toxic substances, air pollution control, and water pollution control.²⁸ It is as though law professors have let themselves become overwhelmed by the complexity of the environment.²⁹ These and other

22. Early course descriptions include A. DAN TARLOCK, *Current Trends in the Development of an Environmental Curriculum*, in *LAW AND THE ENVIRONMENT* 297 (Malcolm F. Baldwin & James K. Page, Jr. eds., 1970); Harrison C. Dunning, *Notes for an Environmental Law Course*, 55 *CORNELL L. REV.* 804 (1970); Frances Irwin, *The Law School and the Environment*, 12 *NAT. RESOURCES J.* 278 (1972).

23. RODGERS, *supra* note 15.

24. *Id.* at 39.

25. One author defines environmental law, but in doing so neglects to define "environment," stating that the environmental law is an organized way of using *all* of the laws in our legal system to minimize, prevent, punish, or remedy the consequences of actions that damage or threaten the environment. J. Gordon Arbuckle, *Environmental Law: What It Is and How It Works*, in *ENVIRONMENTAL LAW HANDBOOK* 1 (Patton, Boggs & Blow eds., 1994).

26. See Westbrook, *supra* note 3, at 628. E.g., PHILIP WEINBERG, *ENVIRONMENTAL LAW CASES AND MATERIALS* (1994) (covering land use and federal regulatory statutes).

27. See MENELL & STEWART, *supra* note 3.

28. See SCHOENBAUM & ROSENBERG, *supra* note 3. Schoenbaum and Rosenberg also have a chapter devoted to international law of the environment.

29. For example, Rodgers calls the "complexity" of the environmental law its "catchword." RODGERS, *supra* note 15, at ix-x. He adds,

I am past the point of apology for being obliged to cut loose from this book on environmental law a host of subjects (among them, toxic torts, international environmental law, marine mammal and fishing laws, mining and forestry laws) that are historically, conceptually, spiritually, and intuitively within the field even while they are practically without.

authors have forgotten that law cannot (allow itself to) be overly complex, for it must be proclaimed by legislators, applied by bureaucrats, and interpreted by lawyers and judges.

To function in a comprehensive manner, the protective environmental legal regime must be systematized. This should begin with a definition of the term "environment" for purposes of environmental law. In undertaking this task, it should be noted that if one chooses a broad definition of the word "environment," such as "where we all live,"³⁰ then certain topics from labor law, agricultural law, planning and land-use law, and health regulations will all qualify for treatment. Another open-ended approach would be to equate the environment with the biosphere, which is the zone on the planet earth where life occurs, extending from the deep crust to the lower atmosphere.³¹ This definition might even encompass the violence in the Balkans, harassment in the workplace, earthquakes, and volcanic eruptions. Such sweeping definitions of "environment" are conducive to expanding people's minds to the exquisite complexity of the natural and man-made worlds, which is a laudable goal. However, as a legal term, an expansive definition brings with it the real threats of scattering the discussion, confusing the issues, and crushing progress under its own weight. Furthermore, there is the practical consideration that separate institutions, interest groups, and legal and other specialists claim as their own certain subject-matter areas, such as public health and labor law. Thus, labor law (workplace environment),³² public health,³³

Id.

30. This is the definition employed by the World Commission on Environment and Development. PATRICIA W. BIRNIE & ALAN E. BOYLE, *INTERNATIONAL LAW AND THE ENVIRONMENT* 2 (1993). BIRNIE & BOYLE is reviewed by the author at 21 *ECOLOGY L.Q.* 1073 (1994). Another broad definition is "an amorphous set of physical surroundings, including the air and waters and wildlife . . . [but] something that in large measure is simply out of our control." Rose, *supra* note 17, at 2-3.

31. See WEBSTER'S NEW WORLD DICTIONARY OF AMERICAN ENGLISH 141 (Victoria Neufieldt & David B. Guralnik eds., 1988). For another broad definition, see the quotation at note 33 *infra*, from Thomas F. P. Sullivan, *Fundamentals of Environmental Law*, in *ENVIRONMENTAL LAW HANDBOOK* 1 (Thomas F. P. Sullivan ed., 13th ed. 1995).

32. The definition of environmental law for certain purposes under NAFTA excludes worker health and safety laws and laws relating to the commercial exploitation of natural resources. North American Agreement on Environmental Cooperation, Art. 45(2), Sept. 14, 1993, Can.-Mex.-U.S., 32 I.L.M. 1480 (1993). The texts of the environmental and labor supplemental agreements and the border finance agreement are published in: Message from the President of the United States Transmitting North American Free Trade Agreement Supplemental Agreements and Additional Documents. 103d Cong., 1st sess., 4 Nov. 1993. H.

population control,³⁴ and planning and land-use³⁵ may safely be excluded from the ambit of environmental law for pragmatic reasons of comity and expediency.

At the other extreme are overly narrow definitions of environment, such as those that restrict the protectable environment to the "natural environment." The term "natural environment" would exclude the activities of man, and might result in limiting the scope of environmental law to what is termed "nature protection" in this paper. Nature protection law belongs traditionally³⁶ and conceptually to environmental law, and warrants treatment there. But narrowing the definition of environment to the natural environment would tell only half the story of environmental law, since it would exclude cities. Most of the world's population lives in cities, and most policy makers mean to protect city dwellers when they speak of environmental law.

Nature protection laws protect the world of nature, excluding mankind, at least in part in its natural state. Accordingly, a legal definition of the environment should have as one object the immediate protection of nature, rather than the direct protection of humans themselves. Nature in this sense means not only flora and fauna, but also landforms, water bodies, mineral deposits, and other geographic features. It might also include the moon and other

Doc. 103-160. See generally Daniel B. Magraw, Jr., *Trade Agreements*, C990 ALI-ABA 193 (May 4, 1995). See also the author's review of Pierre Marc Johnson & André Beaulieu, *The Environment and NAFTA: Understanding and Implementing the New Continental Law*, 24 B.C. ENVTL. AFF. L. REV. 477 (1997).

33. Mr. Sullivan, an attorney in Maryland, considers (at least some facets of) public health to fall within the boundaries of environmental law. He writes, "The environmental law system is an organized way of using all of the laws in our legal system to minimize, prevent, punish or remedy the consequences of actions which damage or threaten the environment, public health and safety." Sullivan, *supra* note 31, at 1.

34. Perhaps Professor Rodgers would include this topic. See RODGERS, *supra* note 15, at 2-5.

35. Land use law complements and regulates city and regional planning, which organizes the uses of property in relation to other property within the jurisdiction of the particular agency. A leading casebook defines land use law as the law that "determines the shape of the physical world around us." ROBERT C. ELLICKSON & A. DAN TARLOCK, *LAND-USE CONTROLS* xxxiii (1981). As in American law, German legal texts treat land use (*Baurecht*) separately. E.g., Martin Oldiges, *Baurecht, in BESONDERES VERWALTUNGSRECHT* 321 (Hans-Wolfgang Arndt et al. eds., 1984).

36. See FINDLEY & FARBER, *supra* note 3; SCHOENBAUM & ROSENBERG, *supra* note 3.

celestial objects. A more common and traditional³⁷ word than "protection" in the context of nature is "conservation," a term that denotes preservation of some irreplaceable and other components of nature, sustained management of renewable resources, and prudent utilization of depletable resources. Of course, some natural items, such as the bacterium that causes Hansen's disease and the virus that causes AIDS, harm man. Because these harmful pieces of nature do not deserve protection,³⁸ they should be excluded from a legal definition of environment.

Environmental policy confronts mistreatment of the world by mankind.³⁹ That is why we do not think of earthquakes and volcanos, and of hurricanes and other natural phenomena, as proper objects of environmental law. On an existential level, environmental law seeks to protect mankind from himself. In so doing, it concentrates its attention on potential and past degradation (from pollution, geographic encroachment, and other sources) of the resources essential for man's survival, specifically, atmosphere (including climatic influences), water, and land. It seeks not only to prevent their degradation but also, in appropriate cases, to restore the quality of resources already damaged.

Having chosen the natural environment (both in the sense of nature and essential resources) as the object of protection, and having determined that the harmful influence of mankind is the evil from which to protect the environment, one must add the notion of "law" to arrive at a working definition of environmental law:

Environmental law covers the aggregate of rules that have as their primary purpose the protection from anthropogenic degradation, or the restoration, of those resources essential to human life (atmosphere, water, and land), the prevention or minimization of pollution, and the conservation of components of nature, including landforms and forms of life not unreasonably injurious to humans.

B. Environmental Policies

One distinctive feature of environmental law as presented in books, and as taught at German universities, is its reliance on

37. See generally M. Sagoff, *On Preserving the Natural Environment*, 84 YALE L.J. 205 (1974).

38. The anti-anthropocentrists might disagree, at least philosophically. See, e.g., Devall, *The Deep Ecology Movement*, 20 NAT. RESOURCES J. 299 (1980).

39. See discussion at note 55, *infra*.

certain policies.⁴⁰ These policies find mention not only in scholarly articles and political discussions, but also in politics, court decisions, administrative regulations, and discussions of environmental policy. The policies of environmental law act as fundamental doctrines or rules upon which all reasonable people are expected to agree. They have a political or philosophical ring. The three most important policies are the precautionary policy (*Vorsorgeprinzip*), the polluter-pays policy (*Verursacherprinzip*), and the policy of cooperation (*Kooperationsprinzip*).⁴¹ This triad is supplemented by a swarm of other lesser policies that either concretize the major policies, act as exceptions to them, or find application only in certain subject-matter areas.⁴² The minor policies include the policy of spreading the loss (*Gemeinlastprinzip*), the policy of maintaining the status quo (*Prinzip der Status-quo-Erhaltung* or *Bestandsschutzprinzip* or also *Verschlechterungsverbot*), the policy of caution (*Vorsichtsprinzip*, “in dubio pro securitate”), the policy of protection (*Schutzprinzip*), the policy of sustained use (*Grundsatz der Nachhaltigkeit*), ecological balancing (*ökologisches Abwägungsgebot*), regulated self-responsibility (*kontrollierte Eigenverantwortlichkeit*), and the cradle-to-grave policy (*Cradle-to-grave-Prinzip*).

The precautionary policy is the most nebulous of the three policies. In its basic expression, the precautionary policy counsels the use of caution where risks are not quantifiable, and the use of the least hazardous alternative reasonably available. The polluter-pays policy, also called the policy of causation, embodies the concept of individual responsibility for changing the environmental status quo. This policy is obvious in laws imposing liability on polluters. Its application is less obvious, but more momentous, in prohibitions, licensing requirements, and permit conditions. The policy of cooperation harbors the notion of shared environmental responsibility as well as the procedural duty of the state to involve the public in the planning of activities that might affect the environment and themselves.

40. The German word *Prinzip* is translated as “policy” rather than the English cognate “principle” because “policy” corresponds more closely in American legal usage to the German usage of *Prinzip*. On the international level, the drafters of the Rio Declaration rejected European suggestions of adopting a precautionary “principle” and instead settled on the precautionary “approach.” Jeffrey D. Kovar, *A Short Guide to the Rio Declaration*, 4 COLO. J. INT’L ENVTL. L. & POL’Y 119, 134 (1993).

41. See SCHMIDT & MÜLLER, *supra* note 1, at 3.

42. See MICHAEL KLOEPFER, *UMWELTRECHT* 72 (1989).

The origin of these policies is usually traced to two statements of the administration of the German government:⁴³ the 1971 Policy Statement of the Administration,⁴⁴ and the 1976 Report on the Environment.⁴⁵ These embodiments of policy are comparable to the declaration of national policy found in the virtually contemporaneous National Environmental Policy Act of 1969 (NEPA).⁴⁶ The 1971 German Administration Policy defines "environmental policy" as follows:

Environmental policy is the totality of measures necessary to guarantee an environment for mankind, which mankind needs for health and a humane existence, to protect soil, air, and water, and flora and fauna, from the detrimental effects of the impacts of man, and to remove the harm or impairment of the impacts of man.⁴⁷

The document continues, announcing the "precautionary policy" (*Vorsorgeprinzip*), "Environmental policy is not limited to protection against risks and to remediation after injury. Precautionary environmental policy demands moreover that essential resources be protected and that they be utilized prudently."⁴⁸ And resort to the polluter-pays policy (*Verursacherprinzip*) is reflected in the following statement: "Anyone who impairs or damages the environment shall defray the costs of this impairment or harm."⁴⁹

These policies have also found their way into European law. Introduced by the Single European Act in 1986, and as amended by the Treaty on European Union (Maastricht), the Treaty of Rome that created the European Economic Community now reads as

43. By the word "administration" (*Regierung*), the author is referring to the prime minister (*Bundeskanzler*) and other ministers, constituted by the political party or coalition of parties in power, and often referred to as the "Government" in parliamentary states such as the United Kingdom.

44. See Umweltprogramm der Bundesregierung von 1971, BT-Drs. VI/2710.

45. See Umweltbericht '76, BT-Dr. 7/5684.

46. 42 U.S.C. §§ 4321-4347 (1994).

47. "Umweltpolitik ist die Gesamtheit aller Maßnahmen, die notwendig sind, um dem Menschen eine Umwelt zu sichern, wie er sie für seine Gesundheit und für ein menschenwürdiges Dasein braucht, um Boden, Luft und Wasser, Pflanzen- und Tierwelt vor nachteiligen Wirkungen menschlicher Eingriffe zu schützen und um Schäden oder Nachteile aus menschlichen Eingriffen zu beseitigen." Umweltprogramm der Bundesregierung von 1971, BT-Drs. VI/2710.

48. "Umweltpolitik erschöpft sich nicht in der Abwehr drohender Gefahren und der Beseitigung eingetretener Schäden. Vorsorgende Umweltpolitik verlangt darüber hinaus, daß die Naturgrundlagen geschützt und schonend in Anspruch genommen werden." *Id.*

49. "Jeder, der die Umwelt belastet oder sie schädigt, soll für die Kosten dieser Belastung oder Schädigung aufkommen." *Id.*

follows: "Community policy on the environment . . . shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay."⁵⁰

The parallel American pronouncement of environmental policy is found in NEPA,⁵¹ an act of Congress rather than a policy statement of the administration. NEPA recognizes the value of cooperation.⁵² Indeed, NEPA's procedures for environmental impact assessment⁵³ can be viewed as an outgrowth of the policy of cooperation. NEPA also establishes the following six goals, all of which can be relegated to the precautionary policy: (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations; (2) assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings; (3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences; (4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice; (5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.⁵⁴

These German and American declarations of policy, all of which are over 25 years old, stress the usefulness and even the necessity of the environment to mankind, rather than the intrinsic value of the environment. And both assert that it is mankind himself who threatens the integrity of his environment.⁵⁵

50. Article 130r (2) of the Treaty Establishing the European Community, formerly styled the Treaty Establishing the European Economic Community, as amended through Jan. 1, 1995.

51. See 42 U.S.C. §§ 4321-4347 (1994).

52. See 42 U.S.C. § 4331(a) (codification of NEPA § 101(a), quoted at note 55 *infra*).

53. See 42 U.S.C. § 4332 (codification of NEPA § 102).

54. See 42 U.S.C. § 4331(b) (codification of NEPA § 101(b)).

55. In NEPA this is found in section 101(a) (codified at 42 U.S.C. § 4331(a)), as follows:

The Congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and new and expanding technological advances and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare

1. *Precautionary Policy (Vorsorgeprinzip)*

According to the precautionary policy, environmental policy should stay one step ahead of the problems of environmental degradation by building a margin of safety into all decision-making. In the language of managers, environmental policy should be proactive rather than reactive. Potential environmental degradation should be anticipated and prevented, and the causes of existing environmental degradation should be attacked. In cases of potential harm of a serious or even irreversible nature, lack of full scientific certainty must not be used to justify postponing measures to prevent environmental degradation. Indeed, if adverse environmental effects cannot be totally avoided, then they should be mitigated to the extent reasonably feasible (called the *Ignoranztheorie*⁵⁶). Special attention should be paid to the cumulative impact of activities whose individual environmental impact may be slight. In its ultimate expression, the precautionary policy respects the sanctity of the environmental status quo. In the legal world, it could support recognizing vested rights in the environment.⁵⁷

and development of man, declares that it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.

56. See SCHMIDT & MÜLLER, *supra* note 1, at 5. Professor Schmidt also derives the following norms from the policy of precaution: levels of pollution shall not be allowed to increase; optimal technology shall be utilized to ensure that permitted emissions do not exceed levels obtainable by present technology; governmental decisions shall not require proof of harm, but rather shall be based on probability of harm from a substance or its concentration; environmental values shall be considered in every governmental decision; and any growth in human society would have to be accompanied by creation of open space (*Freiraumtheorie*). *Id.*

57. One American commentator would uphold any restriction that respects current uses, even when the current use is as vacant land. See John A. Humbach, *Law and a New Land Ethic*, 74 MINN. L. REV. 339 (1989).

Three German statutes—those addressing pollution control,⁵⁸ protection of the water resources,⁵⁹ and genetic engineering⁶⁰—incorporate the precautionary policy into their statements of legislative purpose. For instance, the statement of purpose of the Federal Pollution⁶¹ Control Act reads,

The purpose of this act is to protect human beings, plants and animals, soil, water, and the atmosphere, as well as cultural and other resources, from harmful environmental effects and, to the extent facilities requiring a permit are involved, also from hazards, substantial negative impacts, and nuisances otherwise arising, and to take precautions against the emergence of harmful environmental impacts.⁶²

58. Gesetz zum Schutz vor schädlichen Umwelteinwirkungen durch Luftverunreinigungen, Geräusche, Erschütterungen und ähnliche Vorgänge vom 15. März 1974 (Act for Protection Against Harmful Effects on the Environment from Air Pollution, Noise, Vibrations, and Similar Occurrences of March 15, 1974), I Bundesgesetzblatt ["BGBl."] 721, 1193, last amended April 22, 1993, I BGBl. 880, referred to as the Federal Pollution Control Law (Bundes-Immissionsschutzgesetz) ["BImSchG"]. An English translation of this law, as well as the original German text, appears in the appendix to SCHLEMMINGER & WISSEL, *supra* note 13, at 261 *et seq.* An English translation also appears in GERMAN ENVIRONMENTAL LAW: BASIC TEXTS AND INTRODUCTION 143 (Gerd Winter ed., 1994).

59. Gesetz zur Ordnung des Wasserhaushalts vom 23. September 1986 (Act Regulating the Water Resource of September 23, 1986), I BGBl. 1529, 1654 and amended on Feb. 12, 1990, I BGBl. 295 and Aug. 26, 1992, I BGBl. 1564, referred to as the Water Resource Act (Wasserhaushaltsgesetz) ["WHG"]. An English translation of this law, as well as the original German text, appears in the appendix to SCHLEMMINGER & WISSEL, *supra* note 13, at 457 *et seq.* An English translation also appears in WINTER, *supra* note 58, at 251.

60. Gesetz zur Regelung der Gentechnik vom 20. Juni 1990 (Act of June 20, 1990 Regulating Gene Technology) §1 I, as amended in 1993, I BGBl. 2066, referred to as Gentechnikgesetz ["GenTG"].

61. The German word here translated as "pollution" is *Immission*, which denotes "air pollution, noise, vibration, light, heat, radiation, and similar occurrences that affect human beings, plants and animals, soil, water, and the atmosphere, as well as cultural and other resources" (Immissionen im Sinne dieses Gesetzes sind auf Menschen, Tiere und Pflanzen, den Boden, das Wasser, die Atmosphäre sowie Kultur- und sonstige Sachgüter einwirkende Luftverunreinigungen, Geräusche, Erschütterungen, Licht, Wärme, Strahlen und ähnliche Umwelteinwirkungen). BImSchG § 3 II. The German word *Emission* is defined as "air pollution, noise, vibration, light, heat, radiation, and similar occurrences that emanate from a facility" (Emissionen im Sinne dieses Gesetzes sind die von einer Anlage ausgehenden Luftverunreinigungen, Geräusche, Erschütterungen, Geräusche, Erschütterungen, Licht, Wärme, Strahlen und ähnliche Erscheinungen). BImSchG § 3 III.

62. Zweck dieses Gesetzes ist es, Menschen, Tiere und Pflanzen, den Boden, das Wasser, die Atmosphäre sowie Kultur- und sonstige Sachgüter vor schädlichen Umwelteinwirkungen und, soweit es sich um genehmigungsbedürftige Anlagen handelt, auch vor Gefahren, erheblichen Nachteilen und erheblichen Belästigungen, die auf andere Weise herbeigeführt werden, zu schützen und dem Entstehen

Such legislative recapitulations serve to guide administrative agencies in their decision-making processes. Under the Federal Pollution Control Act, for example, the policy of precaution can influence the decision to grant or deny a construction permit,⁶³ the conditions placed on any such permit,⁶⁴ and the promulgation of regulations.⁶⁵ Further, the Federal Pollution Control Act contains explicit statutory language requiring that facilities subject to a permit requirement be operated in such a way that "precautionary action be taken against effects on the environment."⁶⁶

The ethic of precaution calls for the least destructive alternative to be chosen. This ethical policy norm reverberates in the "best-available-technology" provisions of the German Federal Pollution Control Act,⁶⁷ the Federal Water Resource Act,⁶⁸ and in the Atomic Power Law,⁶⁹ as well as in comparable American legislation, such as the Clean Air Act⁷⁰ and the Clean Water Act.⁷¹ One of the minor⁷² policies that can be subsumed under the policy of precaution is the policy of sustained use or production. Sustained use is codified in the forestry laws of Germany and of the United States⁷³ and in the German Federal Nature Protection

schädlicher Umwelteinwirkungen vorzubeugen. *Id.* § 1

63. See BImSchG § 4.

64. See *id.* §§ 5, 6.

65. See *id.* § 7.

66. "Genehmigungsbedürftige Anlagen sind so zu errichten und zu betreiben, daß . . . Vorsorge gegen schädliche Umwelteinwirkungen getroffen wird, insbesondere durch die dem Stand der Technik entsprechenden Maßnahmen zur Emissionsbegrenzung . . ." *Id.* § 5(1)

67. See BImSchG § 5 II.

68. WHG § 7a.

69. Gesetz über die friedliche Verwendung der Kernenergie und den Schutz gegen ihre Gefahren (Act Governing the Peaceful Use of Nuclear Energy and Protecting Against its Dangers) § 7 II subs. 3, referred to as the Atomic Law (Atomgesetz), and abbreviated AtomG, 1976, I BGBl. 3053, as reenacted July 15, 1985, I BGBl. 1565, and last amended Nov. 5, 1990, I BGBl. 2428.

70. See Clean Air Act § 111, 42 U.S.C. § 7411 (1994).

71. See Clean Water Act § 306, 33 U.S.C. § 1316 (1994).

72. Discussed at note 42, *supra*.

73. Federal law mandates that the National Forests be managed for sustained yield. Multiple-Use Sustained-Yield Act of 1960, 16 U.S.C. § 528 (1994). In the United States, legislation that influences the management of private forestland is primarily the product of the state legislatures. Lundmark, *supra* note 18, at 785. Some states legislate sustained production as a goal for the management of private forests. *E.g.*, CAL. PUB. RES. CODE § 4513(b) (West 1984 and Supp. 1996) ("The goal of maximum sustained production of high-quality timber products is [to be] achieved . . .")

Act.⁷⁴ The Federal Forest Act of Germany states that it is the purpose of the law:

[T]o preserve and, if necessary, to expand the forest because of its economic use (use function) and because of its importance for the environment, in particular for the sustained performance of the natural environment, climate, water supply, air quality, soil moisture, landscape architecture, agricultural structure, and infrastructure, and the recreation of the population (protective and recreational functions), and to ensure the sustained orderly management of the forest.⁷⁵

The policy of precaution has been widely used in international conventional law in recent years. Parties to the Vienna Convention and the Montreal Protocol have agreed to take “precautionary measures” to prevent pollution by substances that threaten the ozone layer.⁷⁶ Since then, numerous international environmental agreements have adopted the “precautionary principle,”⁷⁷ sometimes called the “precautionary approach”⁷⁸ or the “principle of

74. Gesetz über Naturschutz und Landschaftspflege (Act Regarding Nature Protection and Landscape Management), referred to as the Federal Nature Protection Act (Bundesnaturschutzgesetz) [“BNatSchG”], as codified March 12, 1987, I BGBl. 889, last amended Feb. 12, 1990, I BGBl. 205. Section 1 (1) reads: “Nature and the landscape are to be protected, cared for, and developed in communities and in the countryside to secure (1) the . . . variety, uniqueness, and beauty of nature and the landscape . . . in a sustained fashion.” An English translation of this enactment, along with the original German text, appears as an appendix to HORST & SCHLEMMINGER, *supra* note 13, at 523 *et seq.* An English translation also appears in GERMAN ENVIRONMENTAL LAW, *supra* note 58, at 77.

75. Gesetz zur Erhaltung des Waldes und zur Förderung der Forstwirtschaft vom 2. Mai 1975 (Act of May 2, 1975 to Conserve the Forests and Assist Forestry) § 7 I, I BGBl. 1037, last amended July 27, 1984, I BGBl. I 1034, referred to as the Bundeswaldgesetz [“BWaldG”].

76. Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, 26 I.L.M. 1541, 1551. The Protocol was negotiated as a protocol to the Vienna Convention for the Protection of the Ozone Layer. *Id.* at 1541.

77. See Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Mar. 17, 1992, 31 I.L.M. 1312, 1316 (stating that “the Parties shall be guided by the . . . precautionary principle, by virtue of which action to avoid the potential transboundary impact of the release of hazardous substances shall not be postponed on the ground that scientific research has not fully proved a causal link between those substances, on the one hand, and the potential transboundary impact, on the other hand.”)

78. See Rio Declaration on Environment and Development, June 14, 1992, 31 I.L.M. 874, 879 (providing, “In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”)

precautionary action.”⁷⁹

The most important tool for implementation of the precautionary ethic is environmental planning, specifically, the assessment of the expected environmental effects in a report such as that required by NEPA and its German equivalent, the Environmental Impact Assessment Act.⁸⁰ While not referred to as such in American law, the policy of precaution is seen in numerous American environmental regulatory laws.⁸¹

The precautionary policy is important in light of the uncertainty surrounding most environmental issues, especially in the setting of standards. Some would go so far as to say that no measure should be undertaken unless it can be proven that no significant harm will result to the environment. But, in most cases, the question becomes

79. See Report of the Governing Council on the Work of Its Fifteenth Session, United Nations Environment Programme, U.N. GAOR, 44th Sess., Supp. No. 25, 12th mtg. at 153, U.N. Doc. A/44/25 (1989). Representative of the myriad English-language publications on international applications of the policy of precaution are Gundling, *supra* note 11, James Cameron & Julie Abouchar, *The Precautionary Principle: A Fundamental Principle of Law and Policy for the Protection of the Global Environment*, 14 B.C. INT'L & COMP. L. REV. 1 (1991), David Freestone, *The Precautionary Principle*, INTERNATIONAL LAW AND CLIMATE CHANGE 21, 30 (Robin Churchill & David Freestone eds., 1991), Ellen Hey, *The Precautionary Concept in Environmental Policy and Law: Institutionalizing Caution*, 4 GEO. INT'L ENVTL. L. REV. 303 (1992), Bernard A. Weintraub, *Science, International Environmental Regulation and the Precautionary Principle: Setting Standards and Defining Terms*, 1 N.Y.U. ENVTL. L.J. 173 (1992), Mary Pat Williams Silveira, *International Legal Instruments and Sustainable Development: Principles, Requirements, and Restructuring*, 31 WILLAMETTE L. REV. 239, 241 (1995), James E. Hickey, Jr. & Vern R. Walker, *Refining the Precautionary Principle in International Environmental Law*, 14 VA. ENVTL. L.J. 423 (1995), Catherine Tinker, *Is a United Nations Convention the Most Appropriate Means to Pursue the Goal of Biological Diversity?: Responsibility for Biological Diversity Conservation Under International Law*, 28 VAND. J. TRANSNAT'L L. 777, 792 *et seq.* (1995), HARALD HOHMANN, PRECAUTIONARY LEGAL DUTIES AND PRINCIPLES OF MODERN INTERNATIONAL ENVIRONMENTAL LAW 344 (1994), and *Origins and Development of the Precautionary Principle*, in THE PRECAUTIONARY PRINCIPLE AND INTERNATIONAL ENVIRONMENTAL LAW: THE CHALLENGE OF IMPLEMENTATION (David Freestone & Ellen Hey, eds., 1995), and the sources cited at note 11, *supra*.

80. Gesetz über die Umweltverträglichkeitsprüfung vom 12 Feb. 1990 (Environmental Impact Assessment Act of Feb. 12, 1990) ["UVPG"], I BGBl. 205, reprinted with an English translation in SCHLEMMINGER & WISSEL, *supra* note 13, at 639 *et seq.* An English translation also appears in WINTER, *supra* note 58, at 125.

81. Professor Daniel Bodansky, Remarks at Panel of American Society of International Law, *New Developments in International Environmental Law*, 85 PROC. AM. SOC'Y INT'L L. 401, 413-17 (1991). For illustrations of American laws evidencing application of the precautionary policy, see Gregory D. Fullem, *The Precautionary Principle: Environmental Protection in the Face of Scientific Uncertainty*, 31 WILLAMETTE L. REV. 495, 508-13 (1995).

that of just how much harm is acceptable. In the civil law in Germany,⁸² the precautionary policy inspires the shifting of the burden of proof in environmental cases;⁸³ namely, she who changes the environmental status quo has the burden of establishing that her actions did not proximately cause plaintiff's injuries.

2. *Polluter-Pays Policy (Verursacherprinzip)*

Internalization of environmental externalities follows according to the polluter-pays policy, which assigns responsibility for clean-up and other costs to the one who causes pollution. Environmental pollution can be understood as a side-effect (externality) of anthropogenic action. According to market theory, if these social costs of pollution can be internalized, they can be passed on to those who enjoy the benefits. For example, if a factory that emits noise, dust, and smoke is made to pay for those external costs, the factory will pass the cost on to the consumer, who enjoys the benefits. In this way it is hoped not only to internalize the costs, but also to discourage creation of environmental risks. If the externalities cannot be internalized, then the loss should be spread throughout society, rather than be borne by the immediate victims. Failure to compensate the victims results in these people subsidizing the particular product, and conceptually gives rise under German and American law to a claim for compensation.⁸⁴

Causation and liability issues are often encountered with the polluter-pays policy. But the policy does not apply exclusively to issues of clean-up and mitigation. Rather, it proclaims that the initiator (*Verursacher*) fundamentally bears technical and financial responsibility for environmental protection, whether that be through avoidance, mitigation, or compensation.⁸⁵ Thus, legal prohibitions and permit conditions, as well as the civil law remedies of injunction and damages, can be understood as manifestations of the polluter-

82. Discussed at notes 132 to 137, *infra*.

83. See SCHMIDT & MÜLLER, *supra* note 1, at 4. For arguments advocating use of the policy of precaution to shift the burden of proof to those wishing to change the natural status quo, see Philippe Sands, *The "Greening" of International Law: Emerging Principles and Rules*, 1 IND. J. GLOBAL LEGAL STUD. 293, 301 (1994) and Terry Hall, ". . . Carried By The Wind Out To Sea" *Ireland and the Isle of Man v. Sellafield: Anatomy of a Transboundary Pollution Dispute*, 6 GEO. INT'L ENVTL. L. REV. 639, 678 (1994).

84. Discussed *infra* at notes 114 to 131.

85. See ECKARD REHBINDER, *POLITISCHE UND RECHTLICHE PROBLEME DES VERURSACHERPRINZIPS* 36 (1973).

pays policy.

The flip side of the polluter-pays policy is the policy of spreading the loss (*Gemeinlastprinzip*), which is similar in concept to the doctrine of strict liability in tort law.⁸⁶ According to this policy, the costs of environmental protection should be financed by public funds generated through taxation,⁸⁷ and thereby spread through society, assuming that the costs cannot be internalized. Measures attributable to this policy include direct action by the state and its agents as well as indirect action. Indirect action refers to subsidies, grants, tax breaks, and the like.⁸⁸

3. Policy of Cooperation (*Kooperationsprinzip*)

The policy of cooperation is an expression of our mutual dependence upon the environment.⁸⁹ The essence of this policy is procedural: those who undertake an action must notify those whom the action may affect, and must involve them in the planning of the action. This obligation is seen in customary international law in the duty of a state to inform its neighbor of projects that may have a substantial impact on the neighbor's environment, and to involve the neighboring state in the planning.⁹⁰ At the local and regional level, the policy of cooperation means giving notice and an opportunity to be heard to those people who will be most affected by a particular project. The duty of the German state under this policy is codified in a number of laws.⁹¹ Similar provisions in American law abound.⁹²

The cooperation policy recognizes that environmental policy is easier to implement in a cooperative rather than in an adversary environment. The policy of cooperation also animates voluntary activities, which have enjoyed mixed success in Germany. The German government's attempt to induce manufacturers to reduce

86. See generally Thomas Lundmark, *The Restatement of Torts (Third) and the European Product Liability Directive*, 5 DET. C. J. OF INT'L L. & PRAC. 239 (1996).

87. See KLOEPFER, *supra* note 42, at 84.

88. See Thomas Lundmark, 21 ECOLOGY L.Q. 1073, 1076 (1994) (reviewing PATRICIA W. BIRNIE & ALAN E. BOYLE, *International Law and the Environment* (1993)).

89. See SCHLEMMINGER & WISSEL, *supra* note 13, at 419. See generally HANS-WERNER RENGELING, *DAS KOOPERATIONSPRINZIP IM UMWELTRECHT* (1988).

90. See KISS & SHELTON, *supra* note 8, at 132-41.

91. See BWaldG §§ 6 and 7, BNatSchG § 29, and Chemikaliengesetz § 4 VI.

92. See Administrative Procedure Act, 5 U.S.C. § 553 (1994), Negotiated Rule-making Act of 1990, 5 U.S.C. §§ 561-570(a) (Supp. VI 1992), and Clean Air Act § 110, 42 U.S.C. § 7410 (1994).

the use of harmful propellants is cited as a failure of the cooperation policy,⁹³ but the recent success of voluntary recycling⁹⁴ shows that, as a principle of environmental policy, cooperation counts.

C. *Methods*

In American legal periodicals and treatises, the discussion of environmental legal techniques is generally *ad hoc*, often concentrating on more glamorous methods, such as tax incentives.⁹⁵ German scholarship, by contrast, gives prominent treatment to the various methods (called *Instrumente*) for accomplishing environmental purposes. The methods of environmental management form the backbone of academic analysis.

While the German academic literature is not uniform in its enumeration and definition of these methods,⁹⁶ it is unanimous in its conviction that there is a finite number of them. Thus, while the environment itself may be incomprehensibly complex, every single provision of environmental law can be systematized. In this article, the methods of environmental law are split into the following six categories: (1) private rights; (2) direct regulation; (3) economic measures; (4) voluntary programs; (5) environmental assessment; and (6) proprietary governmental action. The discussion begins with private rights, which is the only category that features private law. Private rights are easily eclipsed in importance by direct regulation and by proprietary governmental action, which are by far the most important legal methods of environmental practice in Germany and the United States. The furnishing of subsidies or incentives to encourage environmentally desirable activities finds little use in Germany outside of nature protection legislation. Imposition of charges on harmful activity, such as taxation of gasoline to discourage driving, is relatively rare. One notable voluntary

93. See SCHMIDT & MÜLLER, *supra* note 1, at 7.

94. See George F. Curran III, *Will German Recycling Legislation Serve as a Model for the European Community?*, 3 J. INT'L L. & PRAC. 7 (1994). For a discussion of voluntary measures serving nature protection, see Lundmark, *supra* note 18, at 802-04.

95. For further discussion of the issue, and citation to examples, see generally Westbrook, *supra* note 3, and the comment in note 19, *supra*.

96. For example, Professor Schmidt treats private environmental law separately and employs five classifications for public environmental law: planning instruments; regulatory instruments, environmental impact assessment, fiscal measures, and informal instruments. SCHMIDT & MÜLLER, *supra* note 1, at 8-23. Professor Erbguth divides the methods into four groups: planning, direct regulation, indirect regulation, and state action. Erbguth, *supra* note 9, at 293-96.

program is the recycling of household waste. Environmental assessment has taken on new meaning in Germany, thanks to the Environmental Impact Assessment Act,⁹⁷ which was enacted by the German Parliament to implement the European Directive.⁹⁸

Depending on the intensity, complexity, and texture of the particular environmental problem, all of the methods might find application. Consider disposal of hazardous wastes by a licensed operator. A landowner whose property is contaminated by improper disposal can sue the operator (private rights) and the operator's waste-disposal permit can be revoked (regulation). Licensed operators can be rewarded by bringing hazardous material to a proper disposal site (subsidy).⁹⁹ A deposit can be collected on the sale of items, like batteries, containing hazardous materials; and the deposit will be forfeited if the item is not properly disposed of (pollution charge). An information campaign can alert people that disposing of hazardous wastes in an improper manner will threaten the drinking water supply (voluntary program). A governmental agency might offer to pick up and dispose of the hazardous wastes as a public service (proprietary governmental action).

1. *Private Rights*

Individuals and legal persons enjoy substantive rights to combat and remedy pollution that affects them directly. These rights are found in German codifications of private law, administrative law, and even criminal law. The most important of these provisions are discussed below, along with American parallels.

Claims for damages are statutorily based in Germany. In the United States, they are founded almost exclusively¹⁰⁰ upon the common law.¹⁰¹ Both German and American law allow recovery

97. UVPG, *supra* note 80.

98. The law was announced as Article 1 of the Law to Implement the Council Directive of 27 June 1985 Regarding the Assessment of the Effects of Certain Public and Private Projects on the Environment (85/337/EEC).

99. Indeed, limiting the number of waste-disposal permits is also a type of subsidy, since it depresses supply.

100. The Supreme Court has ruled out recoveries based on an implied cause of action arising out of a violation of federal environmental legislation, and statutory remedies that provide compensation for persons suffering injuries from hazardous waste exposure exist only in Alaska, North Carolina, North Dakota, and Rhode Island. *Development in the Law—Toxic Waste Litigation: IX. Common Law Personal Injury Recovery*, 99 HARV. L. REV. 1602, 1602 (1986).

101. A federal statutory provision for private damage actions for toxic injuries was considered and rejected by Congress. MENELL & STEWART, *supra* note 3, at

on negligence and strict-liability theories in appropriate cases. The availability of injunctive relief in Germany parallels the American law on injunctions against common law nuisances, except that the American law does not generally recognize the defense of compliance with regulatory law. German criminal law is mentioned here because private persons in Germany occasionally possess the right to compel the district attorney to prosecute. This right instills criminal provisions with the character of private enforcement mechanisms.¹⁰²

a. Private Law

Private laws with environmental character have existed for centuries, probably from the beginning of civilized society. It has been possible for centuries to obtain an order for a neighbor to move a pigsty away from a common property line.¹⁰³ Damages are also routinely available for past injury in such cases.¹⁰⁴ The causes of action asserted in Anglo-American courts to redress infringements of property interests are usually founded upon nuisance¹⁰⁵ or trespass¹⁰⁶ theories of liability. The former action remedies any substantial interference with the use and enjoyment of one's land; the latter action redresses any infringement of one's right of exclusive possession. Personal, as opposed to property, interests are ordinarily protected by negligence and strict liability

723.

102. Criminal prosecution is treated more fully in the section of this paper on regulatory methods. See discussion *infra* at notes 182 through 223.

103. The earliest recorded common law nuisance case is believed to be Rakhill's Case, Y.B. Mich. 2 Hen. 4, pl. 48 (1400), reprinted in J.H. BAKER & S.F.C. MILSON, SOURCES OF ENGLISH LEGAL HISTORY: PRIVATE LAW TO 1750, at 581 (1986).

104. See *e.g.*, CAL. CIV. CODE § 3501 (1986).

105. A private nuisance is any substantial interference with the use and enjoyment of another's land that is either (1) "intentional and unreasonable" or (2) "unintentional and otherwise actionable under the rules controlling liability for negligent or reckless conduct, or for abnormally dangerous conditions or activities." Restatement (Second) of Torts § 822 (1965). A public nuisance is "an unreasonable interference with a right common to the public." *Id.* § 821B.

106. Trespass imposes strict liability (without fault) for intentional invasions of another's interest in the exclusive possession of land. *Id.* § 158. For unintentional invasions, liability is imposed only if harm results and the defendant's conduct was negligent, reckless, or abnormally dangerous. *Id.* §§ 157-66. For a general discussion of negligence and trespass, see John E. Bryson & Angus Macbeth, *Public Nuisance, The Restatement (Second) of Torts, and Environmental Law*, 2 ECOLOGY L.Q. 241 (1972).

theories.¹⁰⁷ These causes of action—negligence, strict liability, nuisance, and trespass—belong to the common law of the environment, even though the traditional judicial norms often have been codified in state civil codes.¹⁰⁸ In civil law countries like Germany, such actions are invariably provided for in codifications. In Germany they are found in the German Civil Code, the *Bürgerliches Gesetzbuch* (BGB).¹⁰⁹

Private causes of action are not highly regarded in Germany as a mechanism to protect the environment because they seek to vindicate private, rather than public, rights; and in environmental law, public rights must predominate.¹¹⁰ By recognizing rights in private persons, however, the enforcement of certain laws can be enhanced to the benefit of the general public. But the enforcement will not be uniform, due to local factors and to varying sensibilities of people to environmental factors. Private enforcement can also entail substantial costs to the public in maintaining courts. Despite these shortcomings, German law provides a number of private remedies, such as the Environmental Liability Act,¹¹¹ which is of recent origin.

The following discussion first addresses the availability of damages under various German legislative schemes. These laws are noteworthy in that they shift the burden of proof either by imposing

107. The Restatement (Second) of Torts § 519 (1965) recognizes liability resulting from abnormally dangerous activities. The following factors are considered to determine whether an activity is abnormally dangerous: whether it involves a high degree of risk of some harm; the gravity of the harm; whether the risk cannot be eliminated by the exercise of reasonable care; whether the activity is not a matter of common usage; whether it is inappropriate to the place; and the value of the activity to the community. *Id.* § 520. Other common law theories of recovery are mentioned at notes 138 through 146, *infra*.

108. See e.g., CAL. CIV. CODE § 3479 (1996) (codifying the common law of nuisance).

109. Actions based on provisions of the BGB are brought in the courts of general jurisdiction (*ordentliche Gerichte*).

110. See Gerd Ketteler, *Instrumente des Umweltrechts*, 34 JURISTISCHE SCHULUNG 909, 913 (1994). Accord ZYGMUNT J.B. PLATER ET AL., ENVIRONMENTAL LAW AND POLICY: NATURE, LAW, AND SOCIETY 241 (1992) ("Common law remedies . . . are limited to those whose interests are represented in court, and many would-be plaintiffs are deterred from making that effort by the difficulty and expense of legal action. In that way, tort law remedies fail to compensate and assist all victims of pollution and other environmental harms, and the law governing environmental tort cases is reactive rather than protective").

111. Umwelthaftungsgesetz vom 10 Dez. 1990 (Environmental Liability Act of Dec. 10, 1990), abbreviated UmweltHG, I BGBI. 2634, reprinted with an English translation in SCHLEMMINGER & WISSEL, *supra* note 13, 603 *et seq.* An English translation also appears as an appendix to WINTER, *supra* note 58, at 349 *et seq.*

strict liability, or by creating a presumption of fault or causation. The Environmental Liability Act¹¹² allows a defendant to rebut the presumption of causation if she proves compliance with environmental standards. The discussion then turns to availability of injunctive relief under section 906 of the BGB before mentioning private criminal enforcement. It will be shown that private German remedies correspond generally to the American law, although the latter does not shift the burden of proving causation, nor does it generally recognize compliance with the law as a defense.

i. Claims for Damages

Private civil damage remedies function in two ways to protect the environment. Potential liability may cause would-be polluters to exercise additional care, thus reducing pollution. Also, to the extent that damages are actually paid for injuries caused by pollution, this compensatory system internalizes, if only imperfectly, some extrinsic public costs of injury from pollution.

Several statutes create a right to recover damages in Germany for injury caused to protectable interests by various kinds of pollution. The most important¹¹³ of those provisions are found in section 823 of the *Bürgerliches Gesetzbuch* (BGB), the Water Resource Act, and the Environmental Liability Act. According to BGB section 823, a person who wilfully or negligently injures the life, body, health, freedom, property, or other right of another is liable in damages.¹¹⁴ While liability is not strict, *prima facie* proof by the plaintiff of injury and of proximate cause, according to judicial construction, shifts the burden to the defendant to prove that it was not at fault.¹¹⁵ Damages for pain and suffering (*Schmerzensgeld*) are recoverable by virtue of BGB section 847.¹¹⁶

112. Shifting the burden of persuasion under the Environmental Liability Act is discussed *infra* at notes 132 through 137. The Environmental Liability Act is briefly discussed in Monika Neumann, *The Environmental Law System of the Federal Republic of Germany*, 3 ANN. SURV. OF INT'L. & COMP. L. 69, 107-09 (1996).

113. Other relatively insignificant provisions are BImSchG § 14 sentence 2, AtomG § 25, and GenTG § 32.

114. Translated in B.S. MARKESINIS, *A COMPARATIVE INTRODUCTION TO THE GERMAN LAW OF TORTS* 10 (Oxford, 2d. ed 1990).

115. See NIGEL G. FOSTER, *GERMAN LAW & LEGAL SYSTEM*, 150-51 (LONDON 1993); Robert E. Lutz II, *The Laws of Environmental Management: A Comparative Study*, 24 AM. J. COMP. L. 447, 470-73 (1976).

116. "In the case of injury to body or health, or in the case of deprivation of liberty, the injured party may also demand an equitable compensation in money

Recovery for environmental torts under section 823 is rare. To date, caselaw has been mostly preoccupied with paint damage to parked cars caused by air pollution.¹¹⁷

The second paragraph of BGB section 823 provides for recovery on the principle of negligence per se:

The same obligation [to pay damages] attaches to a person who infringes a statutory provision intended for the protection of others. If, according to the purview of the statute, infringement is possible even without fault, the duty to make compensation arises only if some fault can be imputed to the wrongdoer.¹¹⁸

Many provisions of the Penal Code (*Strafgesetzbuch*) are theoretically embraced under the second paragraph of BGB section 823. One of many examples with *potential* application to environmental injury is section 223 of the Penal Code: "Whoever physically abuses another, or causes impairment to his health, shall be punished by up to three years' imprisonment or by fine."¹¹⁹ Still other¹²⁰ protective statutes of environmental relevance might be found in the Penal Code, although commentators doubt whether every statutorily imposed duty can be employed for this purpose.¹²¹ All told, the second paragraph of section 823 has had an insignificant effect in rectifying environmental harm.¹²²

The Water Resource Act of 1957 imposes strict liability on facilities that directly or indirectly discharge harmful substances for the environmental injury, including costs of clean-up and prevention, caused by water pollution.¹²³ Two factual situations induce liability. In the first, any person who introduces or discharges

for the damage which is not a pecuniary loss. The claim is not transferable and does not pass to the heirs, unless it has been acknowledged by contract, or an action on it has been commenced. A like claim belongs to a woman against whom a crime or offence against morality is committed, or who is induced by fraud, or by threats, or by an abuse of relation of dependence to permit illicit cohabitation." As translated in MARKESINIS, *supra* note 114, at 12.

117. See SCHLEMMINGER & WISSEL, *supra* note 13, at 187.

118. As translated in MARKESINIS, *supra* note 114, at 10.

119. THE AMERICAN SERIES OF FOREIGN PENAL CODES, NO. 28, THE PENAL CODE OF THE FEDERAL REPUBLIC OF GERMANY, 183 (LONDON 1987).

120. See JUERGEN SALZWEDEL & WERNER PREUSKER, THE LAW AND PRACTICE RELATING TO POLLUTION CONTROL IN THE FEDERAL REPUBLIC OF GERMANY 20 (2d ed. 1982).

121. See e.g., PALANDT-THOMAS, BGB § 823 NO. 140 (50th ed. 1991).

122. See Ludger Giesberts, *Environmental Liability for Industrial Installations in Germany*, 1994 INT'L BUS. LAW. 14.

123. See WHG § 22 II; 80 Entscheidungen des Bundesgerichtshofs ["BGHZ"] 1, 7.

substances, or otherwise affects water so as to change its physical, chemical, or biological composition, is liable for consequential damages.¹²⁴ In the second, absolute liability for unintentional releases of harmful substances is imposed upon operators of facilities designed to produce, process, store, deposit, transport, or remove the substances.¹²⁵ Under this latter provision, Sandoz would have been strictly liable for the 1986 discharge of chemicals into the Rhine River if the facility had been located in Germany rather than Switzerland.¹²⁶

The Environmental Liability Act of 1990¹²⁷ imposes civil liability on operators of certain listed facilities¹²⁸ for death, bodily injury, and property damage caused by an "effect" on the environment.¹²⁹ Environmental effects are defined for purposes of the law as "substances, vibrations, sounds, pressure, radiation, gases, fumes, heat, or similar manifestations." Once causation is proven, the infringing party will be held strictly liable. The only available defense to an action brought under this law is *force majeure*.¹³⁰ In exchange for having to endure strict liability, the operators of listed facilities enjoy a liability ceiling of 160 million German marks.¹³¹

124. See WHG § 22 I (Wer in ein Gewässer Stoffe einbringt oder einleitet oder wer auf ein Gewässer derart einwirkt, daß die physikalische, chemische oder biologische Beschaffenheit des Wassers verändert wird).

125. See *id.* § 22 II (Gelangen aus einer Anlage, die bestimmt ist, Stoffe herzustellen, zu verarbeiten, zu lagern, abzulagern, zu befördern oder wegzuleiten, derartige Stoffe in ein Gewässer, ohne in dieses eingebracht oder eingeleitet zu sein, so ist der Inhaber der Anlage zum Ersatz des daraus einem anderen entstehenden Schadens verpflichtet).

126. See Harald Koch, *Mass Torts in German Law*, in GERMAN NATIONAL REPORTS IN CIVIL LAW MATTERS FOR THE XIVTH CONGRESS OF COMPARATIVE LAW IN ATHENS 1994, 70 (Erik Jayme ed., Heidelberg 1994).

127. Umwelthaftungsgesetz vom 10 Dez. 1990, *supra* note 111.

128. These industries are listed in an appendix to the law (Anhang 1) and include 96 categories of facilities from power plants (category 1) to facilities that manufacture wood preservatives (category 96). The appendix, with an English translation thereof, appears in SCHLEMMINGER & WISSEL, *supra* note 13, at 618 *et seq.*

129. UmweltHG § 1 (Umwelteinwirkung). The act allows compensation for injury to body (Körper) and health (Gesundheit). *Id.* This does not permit recovery for pain and suffering. SCHLEMMINGER & WISSEL, *supra* note 13, at 191.

130. *Id.* at § 4 (höhere Gewalt).

131. *Id.* at § 15 (equalling about \$100 million).

Much attention has been paid¹³² to the presumption of proximate cause that arises under the Environmental Liability Act once plaintiff shows that a listed facility¹³³ is apt (*geeignet*) to have caused his injury.¹³⁴ In other words, to prove causation, the plaintiff need only show, by expert epidemiologic opinion or statistics, that the defendant's facility is well suited to have caused his injury. This presumption is rebutted, however, if the operator of the facility shows that the facility was operated in conformity with the law and that there have been no incidents (*Störungen*) during operation.¹³⁵ If the presumption is rebutted, plaintiff must prove causation in order to recover. The "loophole" provided by the compliance-with-the-law defense is often criticized in the literature.¹³⁶ Indeed, admitting this defense is a retreat from strict liability, and will reduce an injured person's likelihood of recovery. On the other hand, the presumption of causation coupled with the defense of compliance can be viewed as conferring a private cause of action, which would not otherwise exist, for failure of the facility to comply with environmental standards. This rebuttable presumption of causation should have the beneficial effect of prompting regulated facilities to undertake fastidious monitoring of their compliance with environmental standards.¹³⁷ Thus, the rebuttable presumption of causation is perhaps better understood not as a compensatory mechanism, but as an environmental compliance mechanism.

American law is generous with common law theories of liability. Plaintiffs injured by so-called toxic torts can recover under

132. See generally Gert Brüggemeier, *Enterprise Liability for "Environmental Damage" in German Law and EC Law*, 2 NEW EUROPE L. REV. 17, 28-30 (1994); Jochen Taupitz, *The German Environmental Liability Law of 1990: Continuing Problems and the Impact of European Regulation*, 19 SYRACUSE INT'L L. & COMM. 13 (1993); Hager, *Das neue Umwelthaftungsgesetz*, 44 NEUE JURISTISCHE WOCHENSCHRIFT 134 (1991); Joachim Scherer, *Liability for Environmental Damage in Germany*, 19 INT'L BUS. L. 309 (1991).

133. Defined *supra* at note 128.

134. UmweltHG § 6 I.

135. See *id.* at §§ 6 II and 6 III. An operator can also escape the presumption by showing that there is another condition that is apt to have caused the injury under the circumstances of the particular case. UmweltHG § 7 is discussed in SCHLEMMINGER & WISSEL, *supra* note 13, at 190-91.

136. See SCHMIDT & MÜLLER, *supra* note 1, at 22; Hager, *supra* note 132, at 138.

137. See Hans D. Jarass & Joseph DiMento, *Through Comparative Lawyers' Goggles: A Primer on German Environmental Law*, 6 GEO. INT'L ENVTL. L. REV. 47, 65 (1993).

theories of negligence,¹³⁸ trespass,¹³⁹ nuisance,¹⁴⁰ and strict liability. The doctrine of strict liability has been particularly virile, having enabled recovery for harm caused by mercury seeping into a creek,¹⁴¹ by asbestos exposure,¹⁴² by hazardous chemical wastes injected into an oil pipeline,¹⁴³ by chemical contamination of ground water,¹⁴⁴ and by exposure to Agent Orange.¹⁴⁵ And, once proximate cause has been shown, the American law is liberal in spreading liability among multiple potential tortfeasors where the particular responsible party cannot be ascertained. Thus, where plaintiffs cannot prove which of the numerous defendants had owned the polluting property at the time the hazardous substance was released, all of the present and former owners must share liability.¹⁴⁶

138. See *Knabe v. Nat'l Supply Div. of Armco Steel Corp.*, 592 F.2d 841 (5th Cir. 1979) (farmers recovered damages for injury to their dairy business as a result of water pollution caused by defendants' negligence).

139. See *City of Phila. v. Stepan Chem. Co.*, 544 F. Supp. 1135 (E.D. Pa. 1982) (city recovered cleanup costs and consequential damages which resulted from illegal dumping in city landfill of industrial waste generated by defendants).

140. See *Village of Wilsonville v. SCA Services*, 426 N.E.2d 824 (Ill. 1981) (defendant enjoined on nuisance theory from operating chemical waste landfill).

141. See *Dep't of Env'tl. Protection v. Ventron Corp.*, 468 A.2d 150 (N.J. 1983).

142. See *Beshada v. Johns-Manville Prod. Corp.*, 447 A.2d 539 (N.J. 1982). On European and American strict-liability law for defective products, see Lundmark, *supra* note 86.

143. See *Ashland Oil, Inc. v. Miller Oil Purchasing Co.*, 678 F.2d 1293 (5th Cir. 1982).

144. See *Sterling v. Velsicol Chem. Corp.*, 855 F.2d 1188 (6th Cir. 1988).

145. See *In re Agent Orange Prod. Liab. Litig.*, 611 F. Supp. 1223 (E.D.N.Y. 1985), *aff'd on other grounds*, 818 F.2d 187 (2d Cir. 1987).

146. See *Zands v. Nelson*, 779 F. Supp. 1254 (S.D. Cal. 1991), discussed in Melinda H. Van der Reis, *An Amendment for the Environment: Alternative Liability and the Resource Conservation and Recovery Act*, 34 SANTA CLARA L. REV. 1269 (1994). This is the approach followed by the Restatement (Second) of Torts § 875 (1977) ("Each of two or more persons whose tortious conduct is a legal cause of a single and indivisible harm to the injured party is subject to liability to the injured party for the entire harm"). In the field of health law, the Supreme Court of California has developed and applied "market share" liability to manufacturers of harmful drugs. *Sindell v. Abbott Labs.*, 163 Cal. Rptr. 132, 26 Cal. 3d 588, 607 P.2d 924 (1979). This theory is sometimes termed "risk contribution" or "enterprise liability." *Collins v. Eli Lilly Co.*, 116 Wis. 2d 166, 342 N.W.2d 37, 46-47 (1984) (risk contribution); *Hall v. E.I. du Pont de Nemours & Co.*, 345 F. Supp. 353, 378 (E.D.N.Y. 1972) (enterprise liability). See generally James M. Olson, *Shifting the Burden of Proof: How the Common Law Can Safeguard Nature and Promote an Earth Ethic*, 20 ENVTL. L. 891 (1990); James E. Krier, *Environmental Litigation and the Burden of Proof*, LAW AND THE ENVIRONMENT 105 (Malcolm Baldwin & James E. Page, Jr. eds., 1970).

But American law is not as generous to plaintiffs when it comes to causation,¹⁴⁷ which is usually the most formidable barrier facing a toxic tort plaintiff.¹⁴⁸ An American federal judge in the case of *Allen v. United States*,¹⁴⁹ in which recovery was sought for cancers allegedly caused by exposure to radioactive fallout from the testing of atomic weapons, applied a presumption of causation exactly as provided for under the German Environmental Liability Act. The court ruled that, if an ill plaintiff could provide evidence that his illness was “consistent with having been caused” by exposure to a hazard, then the burden shifted to the defendant to prove that the exposure did not cause plaintiff’s injuries. The case was reversed on appeal in a decision holding that the federal government and its contractors were immune from liability;¹⁵⁰ its reasoning has not been followed. Nor does the American law recognize the defense of compliance with regulatory law.¹⁵¹ Perhaps this defense should be recognized and coupled, as in Germany, with a presumption of causation.

147. See e.g., *Viterbo v. Dow Chem. Co.*, 646 F. Supp. 1420 (E.D. Tex. 1986), *aff’d* 826 F.2d 420 (5th Cir. 1987) (summary judgment granted in favor of defendant where plaintiff failed to supply epidemiological or admissible evidence to support allegation that plaintiff’s use of defendant’s herbicide caused the alleged injuries); *Garner v. Hecla Mining Co.*, 19 Utah 2d 367, 431 P.2d 794 (1967) (plaintiff failed to establish that uranium mining caused decedent’s cancer, even though higher-than-average rate of cancer existed among uranium miners).

148. *Developments in the Law—Toxic Waste Litigation: IX. Common Law Personal Injury Recovery*, 99 HARV. L. REV. 1602, 1617 (1986).

149. 588 F. Supp. 247 (D. Utah 1984), *rev’d*, 816 F.2d 1417 (10th Cir. 1987). *Allen* is discussed in MENELL & STEWART, *supra* note 3, at 755. For an explication of *Allen* in the context of a perceived shift from individual to group responsibility in tort, see Robert A. Baruch Bush, *Between Two Worlds: The Shift from Individual to Group Responsibility in the Law of Causation of Injury*, 33 UCLA L. REV. 1473, 1516-18 (1986).

150. See *Allen*, 588 F. Supp. at 247. To take advantage of the government contract defense, the governmental contractor (such as those that manufactured Agent Orange) must prove that it acted in compliance with government specifications and the contractor warned the government about any hazards known to the contractor and not to the government. *Hercules, Inc. v. United States*, 516 U.S. 417 (1996). See also *Boyle v. United Technologies Corp.*, 487 U.S. 500 (1988), discussed in Robert E. Shields, *Defenses and Offset*, 1 A GUIDE TO TOXIC TORTS § 9.06 at 9-46 (Mary Tyler Searcy ed., 1993). See also Robert F. Blomquist, *Emerging Themes and Dilemmas in American Toxic Tort Law, 1988-91: A Legal-Historical and Philosophical Exegesis*, 18 S. ILL. U. L. J. 1, 31 (1993).

151. See David G. Owen, *Punitive Damages Awards in Product Liability Litigation: Strong Medicine or Poison Pill?: A Punitive Damages Overview: Functions, Problems and Reform*, 39 VILL. L. REV. 363, 412 (1994) (discussing the possibility that a tort defendant’s compliance with pertinent regulatory or other legal provisions may serve as an absolute defense to, or that it may give rise to a presumption against, punitive - not compensatory - damages).

Whether the Environmental Liability Act will have the desired effects of compensation and compliance is still a matter of speculation.¹⁵² The developments in Germany should be watched by Americans to assess whether the German solution of presuming proximate cause, coupled with a compliance-with-the-law defense, might deserve importation. But it should not be expected that damage remedies—even private injunctive remedies, for that matter—can have more than a limited, secluded effect on enhancing and maintaining environmental quality. Indeed, it is the failure of private remedies to protect the environment that necessitates the development and refinement of the remaining methods of environmental policy.

ii. Claims for Injunctive Relief

The main statutory provision providing for prohibitory and injunctive relief in an environmental context is the nuisance prohibition of BGB section 906, which reads as follows:

(1) The owner of a piece of land is not entitled to prohibit the intrusion of gases, vapors, smells, smoke, soot, heat, noise, shocks and similar interferences emanating from another piece of land to the extent that the interference does not or only immaterially prejudices the use of his piece of land.

(2) The same applies insofar as a substantial prejudice is caused by the use of another piece of land in conformity with local custom and it cannot be prevented by measures, the financing of which can be reasonably expected of users of this kind. If by virtue of this, the owner must tolerate an interference, he may demand from the user of the other piece of land an appropriate settlement in money, if by the interference in conformity with local custom the use of, or income from, his piece of land is prejudiced over and above the expected degree.

(3) The causing of intrusion through a special conduit is not permissible.¹⁵³

The provision quoted above contains two important qualifications which find parallels in the Anglo-American doctrine of nuisance. First, a landowner will not be heard to complain unless

152. See Erbguth, *supra* note 9, at 298. In the United States, the number of cases involving toxic waste personal injury is extremely low; and toxic waste actions for major disease personal injury have been virtually nonexistent. *Developments in the Law—Toxic Waste Litigation*, *supra* note 148, at 1603, n. 6.

153. As translated in MARKESINIS, *supra* note 114, at 18.

the nuisance materially interferes with the use and enjoyment of property¹⁵⁴ and is considered abnormal for the locality.¹⁵⁵ Second, no nuisance may be enjoined if it is operated in the customary fashion and abatement is not economically reasonable.¹⁵⁶ This latter provision effectively codifies the holding of the much discussed *Boomer v. Atlantic Cement Company* case.¹⁵⁷ The court in *Boomer* found the operation of a cement plant to constitute a nuisance, but, in contravention of the common law rule, refused to issue the injunction prayed for, as to do so would have meant closing the plant, which was the principal employer in the region. Instead, the court awarded damages for diminution in the value of the plaintiffs' property. The decision has been criticized in the American academic literature because awarding damages for future activity explicitly allows the continuation of a public wrong (a nuisance) and indirectly affords the operators of the cement plant the benefits of the power of eminent domain,¹⁵⁸ which only public agencies ordinarily enjoy.¹⁵⁹

In Germany, no injunction is available against facilities which have been licensed under the Federal Pollution Control Law and some other laws.¹⁶⁰ In the United States, compliance with the law is, with few exceptions, no defense to a nuisance or other action. Occasional state statutes provide that compliance with permit conditions and state regulatory law is prima facie evidence that a particular facility, such as a farm, does not constitute a nuisance.¹⁶¹ In exceptional cases, compliance with the law is an

154. See CAL. CIV. CODE § 3493 (1996); *McIvor v. Mercer-Fraser Co.*, 76 Cal. App. 2d 247 (1946). See also the definition of nuisance in the Restatement, *supra* note 105, requiring that the interference be substantial.

155. See FOSTER, *supra* note 115, at 151. See the Restatement's requirement for nuisance liability, *supra* note 105, that the interference be unreasonable and, *supra* note 107, that the abnormally dangerous activity be inappropriate to the place. Cf. TENN. CODE ANN. § 44-18-102(c) (1997) (normal noises of animals or fowl, noises of equipment, or normal odors are not grounds for a nuisance action).

156. See BImSchG § 14.

157. 257 N.E.2d 870 (N.Y. 1970).

158. See Westbrook, *supra* note 3, at 633 n. 30.

159. See e.g., *United States v. Clarke*, 445 U.S. 253, 255 (1980); see also PHILIP NICHOLS, *EMINENT DOMAIN* ¶ 25.41 (3d rev. ed. 1972).

160. See BImSchG § 14; FOSTER, *supra* note 115, at 151. Other examples can be found in the Atomic Power Law (AtomG § 7 VI) and the Water Supply Law (WHG § 11).

161. See e.g., NEB. REV. STAT. § 81-1506 (1996); KAN. STAT. ANN. §§ 47-1505 (1996); Okla. Stat. tit. 2 §§ 9-210 (1996).

absolute defense.¹⁶² Perhaps this German immunity from civil prosecution should be adopted in the United States in certain cases, for it reflects a conviction that democratically constituted bodies are better equipped than courts to balance the interests competing for recognition.

b. Administrative Law

The public's right to judicial review of administrative decisions arises directly from the German *Grundgesetz*.¹⁶³ But, to confer standing, the injury must be personal and substantial. Those seeking to challenge a decision of an administrative agency must allege violation of a legally protected interest.¹⁶⁴ In practice, this means that the petitioner must reside close to the source of the pollution.¹⁶⁵ While citizens are afforded access to public records,¹⁶⁶ citizen actions as such do not exist.¹⁶⁷ The same holds true for organizations. Only certain recognized associations have standing to sue, and they must show injury to property rights.¹⁶⁸ This contrasts strikingly with liberal rules of standing,¹⁶⁹ and with private enforcement actions,¹⁷⁰ in the United States.

162. See, e.g., IOWA CODE ANN. § 172D.2 (West 1982-83), and Wyo. Stat. § 11-39-102 (1977) (feedlots), discussed in Margaret Rosso Grossman & Thomas G. Fischer, *Protecting the Right to Farm: Statutory Limits on Nuisance Actions Against the Farmer*, 1983 WIS. L. REV. 95, 110 (1983).

163. "Judicial review is available to anyone injured by state action." Grundgesetz Art. 19 IV (Wird jemand durch die öffentliche Gewalt in seinen Rechten verletzt, so steht ihm der Rechtsweg offen). A petition for review is brought in the administrative court (*Verwaltungsgericht*) after exhaustion of administrative remedies (*Widerspruchsverfahren*).

164. See Verwaltungsgerichtsordnung § 42.

165. See Jarass & DiMento, *supra* note 137, at 56.

166. See BImSchG § 10 III.

167. See Michael S. Greve, *The Non-Reformation of Administrative Law: Standing to Sue and Public Interest Litigation in West German Environmental Law*, 22 CORNELL INT'L L.J. 197, 201-02 (1989).

168. See KLOEPFFER, *supra* note 42, at 368. Sometimes state law grants standing to certain organizations to challenge actions of the nature-protection agency. SCHLEMMINGER & WISSEL, *supra* note 13, at 150.

169. See e.g., Administrative Procedure Act § 10, 5 U.S.C. § 702 (1994); *Assoc'd. General Contractors v. City of Jacksonville*, 508 U.S. 656 (1993); Cass Sunstein, *What's Standing After Lujan?*, 91 MICH. L. REV. 163 (1992).

170. See Toxic Substances Control Act, 15 U.S.C. § 2619(a)(1) (1994); Endangered Species Act, 16 U.S.C. § 1540(g)(1)(A) (1994); Surface Mining Control and Reclamation Act, 30 U.S.C. § 1270(a)(1) (1994); Federal Water Pollution Control Act, 33 U.S.C. § 1365(a)(1) (1994); Marine Protection, Research, and Sanctuaries Act, 33 U.S.C. § 1415(g)(1) (1994); Safe Drinking Water Act, 42 U.S.C. § 300j-8(a)(1) (1994); Noise Control Act, 42 U.S.C. § 4911(a)(1) (1994); Resource

The standard of review of administrative decisions in most cases in Germany is not strictly limited to the administrative record, but rather it is *de novo*.¹⁷¹ This standard arises from the principle of reasonableness (*Verhältnismäßigkeitsprinzip* or *Übermaßverbot*), which is the German equivalent of substantive due process.¹⁷² The principle of reasonableness, often translated as the “principle of proportionality,”¹⁷³ is an uncodified construct that seeks to effectuate the policy that a liberal democracy should only tread upon constitutional rights to the extent absolutely necessary.¹⁷⁴ State action violating the principle is void. The four¹⁷⁵ component

Conservation and Recovery Act, 42 U.S.C. § 6972(a)(1) (1994); Clean Air Act, 42 U.S.C. § 7604(a)(1) and (3) (1994); Outer Continental Shelf Lands Act, 43 U.S.C. § 1349(a)(1) (1994). For an example from state law, see the Michigan Environmental Protection Act, Mich. Comp. Laws §§ 691.1203-1207 (1980), Mich. Stat. Ann. §§ 14.528 (203)-(207) (Callaghan 1989).

171. See Jarass & DiMento, *supra* note 137, at 57. For an in-depth look at environmental administrative practice, see SUSAN ROSE-ACKERMAN, *CONTROLLING ENVIRONMENTAL POLICY: THE LIMITS OF PUBLIC LAW IN GERMANY AND THE UNITED STATES* (1995).

172. See Harald Koch, *Die Rechtsstaatsklauseln der amerikanischen Verfassung in ihren Auswirkungen auf das Prozeßrecht*, 29 LIBERAL, VIERTELJAHRESHEFTE FÜR POLITIK UND KULTUR 10 (1987).

173. See DAVID P. CURRIE, *THE CONSTITUTION OF THE FEDERAL REPUBLIC OF GERMANY*, at 20 (1994), Hartwin Bungert, *Equal Protection for Foreign and Alien Corporations: Towards Intermediate Scrutiny for a Quasi-Suspect Classification*, 59 MO. L. REV. 569, 585 n. 66 (1994), and Matthias Herdegen, *The Relation Between the Principles of Equality and Proportionality*, 22 COMMON MARKET L. REV. 683 (1985). The term “reasonableness” is used here because it encompasses the entire decisional matrix, rather than emphasizing the last steps. It is also hoped that use of the term “reasonableness” will avoid confusion with the proportionality review employed by the European Court of Justice, discussed in Stephen Weatherill, *Cases and Materials on EC Law*, 33 *et seq.* (2d ed. 1995), and by the European Court of Human Rights. *E.g.*, *James v. United Kingdom*, 8 E.H.R.R. 123 (1986), discussed in Note, *Does Lochner Live in Luxembourg?: An Analysis of the Property Rights Jurisprudence of the European Court of Justice*, 18 FORDHAM INT’L L.J. 1778, at nn. 191-207 and 478 (1995).

174. See generally Helmut Rittstieg, *Artikel 14/15*, I KOMMENTAR ZUM GRUNDGESETZ FÜR DIE BUNDESREPUBLIK DEUTSCHLAND § 7.6 ¶ 210 (2d ed. 1989). For a short discussion of the rule of reasonableness and its origins, see CURRIE, *supra* note 173, at 307-10.

175. The principle of reasonableness is almost always reported to have three components. *E.g.*, Albert Bleckmann, *Begründung und Anwendungsbereich des Verhältnismäßigkeitsprinzips*, 34 JURISTISCHE SCHULUNG 177 at 178 (1994); Jarass & DiMento, *supra* note 137, at 65; Volkmar Götz, *Legislative and Executive Power and the Constitutional Requirements Entailed in the Principle of the Rule of Law*, NEW CHALLENGES TO THE GERMAN BASIC LAW, at 153 (Christian Starck ed., 1991). The first component is basic and is subsumed in the second component in most recapitulations of the principle of reasonableness. The first component is included here to remind readers of its existence, to ease incorporation into American law, and to highlight the importance of identifying the particular

tests of the principle of reasonableness are the following: (1) legality and constitutionality of the purpose or end; (2) appropriateness of the means; (3) necessity for the infringement; and (4) balancing (*Güterabwägungsprinzip*), also called the prohibition against disproportionate means (*Proportionalität*).¹⁷⁶

Judicial review of administrative decisions in Germany goes to the heart of the matter. As in the United States, courts are major actors in the area of environmental protection.¹⁷⁷

c. Criminal Law

Prosecutorial discretion in Germany is limited. The district attorney (*Staatsanwalt*) is required by law to investigate and, if warranted, to prosecute whenever presented with facts suggesting the commission of an offense.¹⁷⁸ For certain offenses, such as battery, an injured person can petition the court to compel the district attorney to prosecute.¹⁷⁹ The victim can also petition the court to appoint him as collateral prosecutor.¹⁸⁰

While these provisions of the criminal law are theoretically available to remedy environmental wrongs, they are of little practical consequence to environmental protection and remediation in Germany.¹⁸¹

2. Direct Regulation

The workhorse of any comprehensive program of environmental protection is direct regulation. Direct regulations promote all three objects of environmental protection; they shield essential resources, forbid or minimize emissions of pollutants, and guard components of nature against human agencies. Regulations can

governmental power (e.g., taxing power, treaty power, commerce power) in the decisional hierarchy. For further discussion of the principle of reasonableness, applying the principle to American law, see THOMAS LUNDMARK, *TAXONOMY OF GERMAN TAKINGS JURISPRUDENCE* (publication pending).

176. See 30 BVerfGE 1 at 20; 78 BVerfGE 232 at 245-47.

177. See Jarass & DiMento, *supra* note 137, at 57.

178. See *Strafprozeßordnung in der Fassung vom 7. April 1987*, I BGBl. 1075 (Criminal Procedure Act as amended April 7, 1987), referred to as *Strafprozeßordnung* ["StPO"], §§ 151-52, 160.

179. See StPO § 172 (Klageerzwingungsverfahren).

180. See StPO §§ 395-402 (Nebenkläger).

181. See REINHARD STEIGER & OTTO KIMMINICH, *THE LAW AND PRACTICE RELATING TO POLLUTION CONTROL IN THE FEDERAL REPUBLIC OF GERMANY* 56 (1976).

undoubtedly be credited with reducing atmospheric and aquatic pollution. In fact, "command and control" regulations pervade the law of the environment so completely that they can be likened to an environmental safety net. But, like a safety net, direct regulations afford ultimate protection for extreme cases. They often entail the setting of complicated standards. Rooted, as they are, in the law of nuisance and police power, regulatory methods threaten rather than cajole; they aim to avoid vice, rather than seek to attain virtue. They depend utterly upon vigorous enforcement, usually by costly special-purpose administrative agencies.

As with the overarching environmental methods, the subdivision of various regulatory submethods of direct regulation is not uniform in Germany.¹⁸² But no matter the grouping, the subdivision process itself serves to expose the strengths and weaknesses of the particular regulatory method, helping regulators to target their use most effectively. The regulatory groups discussed below are command regulations, licensing, criminal prosecution, and notice requirements. All four find wide-spread application in German law as well as American law.

Examples of German command regulations abound. They include standards and prohibitions under the Aircraft Noise Protection Act of 1971,¹⁸³ the Leaded Gasoline Act,¹⁸⁴ and the Regulation on Rail Shipments of Dangerous Goods.¹⁸⁵ At present, German parliamentarians are considering enactment of a Soil Protection Act.¹⁸⁶ American cognates to these provisions are found in the Aviation Safety and Noise Abatement Act of 1979,¹⁸⁷

182. Cf. HOPPE & BECKMANN, *UMWELTRECHT* § 8 (1989); KLOEPFER, *supra* note 42, at 4; Ketteler, *supra* note 110, at 826; SCHMIDT & MÜLLER, *supra* note 1, at 8; SCHLEMMINGER & WISSEL, *supra* note 13, at 47 *et seq.*

183. Gesetz zum Schutz gegen Fluglärm vom 30. März 1971 (Aircraft Noise Protection Act of March 30, 1971), I BGBl. 282 amended September 25, 1990, I BGBl. 2106 ["FlugLG"].

184. Gesetz zur Verminderung von Luftverunreinigungen durch Bleiverbindungen in Ottokraftstoffen für Kraftfahrzeugmotore vom 5. August 1971 (Act to Reduce Air Pollution from Lead Compounds in Fuel for Vehicle Engines of Aug. 5, 1971), I BGBl. 1234, amended December 18, 1987, I BGBl. 2810 ["BzBIG"].

185. Verordnung über die innerstaatliche und grenzüberschreitende Beförderung gefährlicher Güter mit Eisenbahnen (Regulation on the Intrastate and International Shipment of Dangerous Goods by Rail), as amended June 10, 1992, I BGBl. 1224. This is just one of many provisions of international, European, and national statutory and regulatory law on the transportation of dangerous goods in Germany. For a listing of others, see SCHLEMMINGER & WISSEL, *supra* note 13, at 90-93.

186. Sueddeutsche Zeitung, Jan. 18, 1997 (*Bodenschutzgesetz*).

187. 49 U.S.C. §§ 47501-33 (Aviation Safety and Noise Act). *See also* 42 U.S.C. § 47523(a) (1997) and 14 C.F.R. 91.817 (1997) for control and abatement of aircraft

the Clean Air Act,¹⁸⁸ which prohibits the sale of leaded gasoline for motor vehicle use,¹⁸⁹ and the Hazardous Materials Transportation Act.¹⁹⁰ The “best available technology” requirements of the German¹⁹¹ and American¹⁹² environmental law also belong in the subgroup of command regulations.

A recent example of a German command regulation is the Regulation on the Avoidance of Packaging Waste of 1991,¹⁹³ whose ground-breaking provisos require that manufacturers and distributors take back transport packaging after use and reuse or recycle it outside the public waste disposal system,¹⁹⁴ that distributors who supply goods in group packaging remove the packaging before delivery of the goods to consumers and return it free of charge from the point of sale,¹⁹⁵ and that mail order businesses take back used sale packaging without charge to the consumer.¹⁹⁶ The imposition of these duties is intended to internalize the cost of disposal of packaging waste which otherwise would quite literally be dumped onto governmental waste-disposal sites. By this, the Packaging Regulation concretizes the polluter-pays policy.¹⁹⁷ To comply with these duties, the regulated industries have, as foreseen by the Packaging Regulation,¹⁹⁸ formed a recycling conglomerate called Duales System Deutschland GmbH that collects packaging imprinted with a “Green Dot” (Grüner Punkt).¹⁹⁹ Even more far-reaching is the potential application of

noise and sonic booms.

188. 42 U.S.C. § 7671(q) (1994).

189. See 42 U.S.C. § 7545(n).

190. 49 U.S.C. § 5127 (1994).

191. See BImSchG § 5 II and WHG § 7a I.

192. See Clean Air Act § 306, 42 U.S.C. § 7470 (1997) and Clean Water Act § 306, 33 U.S.C. § 1316 (1997).

193. Verpackungsverordnung, 1991, I BGBl. 1234 [“VerpackV”], translated in 31 I.L.M. 1138 (1992).

194. VerpackV § 4. Originally, incineration was illegal. Clemens Weidemann, *Introductory Note*, 31 I.L.M. 1135 (1992). Now, incineration is permitted if it is more energy-efficient to burn the material than to recycle it. Stephanie A. Goldfine, Note, *Using Economic Incentives to Promote Environmentally Sound Business Practices: A Look at Germany's Experience with its Regulation on the Avoidance of Packaging Waste*, 7 GEO. INT'L ENVTL. L. REV. 309, 337 (1994).

195. See VerpackV § 5 I.

196. See *id.* at § 6 Ia.

197. Discussed *supra* at notes 84 through 88.

198. See VerpackV § 6 III.

199. The system has enjoyed mixed success. See Goldfine, *supra* note 194, at 332-38 and sources cited.

the 1994 Circulation Management and Waste Act²⁰⁰ with its concept of "product responsibility."²⁰¹ When fully implemented, this law will require manufacturers and others to manufacture, package, and distribute their products to avoid waste-generation and to assure recycling or other environmentally compatible disposal.²⁰²

Command regulations are very often coupled with licensing requirements. These requirements can be either ministerial or discretionary.²⁰³ An example of the former is the licensing pursuant to the German Federal Pollution Control Act²⁰⁴ of facilities that are particularly likely to cause harmful environmental effects. Should the applicant fulfill the statutory requirements, a license must be issued.²⁰⁵ An example of a discretionary permit is the variance granted under the Federal Nature Protection Act in cases of unanticipated hardship, or when enforcement would result in undesired impairment of nature and the landscape.²⁰⁶ A further refinement of the licensing method is the imposition of conditions, the violation of which brings revocation.²⁰⁷

The Act to Combat Environmental Criminality of 1980²⁰⁸ codified the existing criminal sanctions for the protection of the environment and incorporated new ones into a chapter of the Criminal Code entitled Offenses Against the Environment.²⁰⁹ Under this law, negligent pollution of public surface or ground water can bring five years' imprisonment,²¹⁰ as can unlawful handling of nuclear materials.²¹¹ The declared purposes of the act are to raise public consciousness about the importance of protecting

200. Kreislaufwirtschafts- und Abfallgesetz, 1994, I BGBl. 2705, called Kreislaufwirtschaftsgesetz, which might also be translated as Business-Cycle Law or Circulation Economy Act.

201. Martin Beckmann, *Produktverantwortung: Grundsätze und zulässige Reichweite*, 1996 UMWELT- UND PLANUNGSRECHT 41. "Product responsibility" is a translation of the German *Produktverantwortung*.

202. See SCHLEMMINGER & WISSEL, *supra* note 13, at 113.

203. These are referred to in German as "preventive" (*präventive*) or "repressive" (*repressiv*) prohibitions. SCHMIDT, *supra* note 1, at 11.

204. BImSchG § 4.

205. See *id.* at § 6. Bernd Kunth, *Environmental Law in Germany*, COMPARATIVE ENVIRONMENTAL LAW AND REGULATION 12, 16 (Nicholas A. Robinson ed., 1996).

206. See BNatSchG § 31 I.

207. See BImSchG § 21 I (1).

208. Gesetz zur Bekämpfung der Umweltkriminalität (Act to Combat Environmental Criminality), 1994, I BGBl. 1440.

209. Straftaten gegen die Umwelt, StGB §§ 324-330.

210. *Id.* § 324.

211. *Id.* § 328.

the environment, to underscore the social harm caused by environmental crime, and to employ the deterrent power of the criminal law.²¹² Criminal prosecutions are rare, and commentators agree that the high-minded goals of the legislation have not been met.²¹³

The regulatory mechanism that intrudes the least into individual rights is the obligation to give the regulatory body (an administrative agency) notice of intended or accomplished acts that may fall within their jurisdiction, thus enabling regulators to procure data and to check compliance with applicable administrative standards. Examples of such notice requirements are found in the Law Regulating Environmental Statistics,²¹⁴ the Law Regulating Lead in Gasoline,²¹⁵ the Federal Pollution Control Law,²¹⁶ the Federal Forest Law,²¹⁷ the Fertilizer Law,²¹⁸ and the Law Regulating Soaps and Detergents.²¹⁹ Examples in the United States include advance notice requirements of intent to remove asbestos,²²⁰ the continuous emissions monitoring (CEM) requirement for certain facilities under the Clean Air Act,²²¹ the pre-manufacturing notice (PMN) requirement under the Toxic Substances Control Act,²²² and the spill-reporting requirements under the Clean Water Act.²²³

212. BT-Dr 8/2382, at 1, 9; 8/3633, at 1 *et seq.*, 19.

213. Ketteler, *supra* note 110, at 914. On prosecutions in the United States, see generally Anne Kobayashi, Erin Koenen, Michele Namm, & Amy Phillips, *Environmental Crimes*, 33 AM. CRIM. L. REV. 607 (1996).

214. Gesetz über Umweltstatistiken vom 14 März 1980 (Act Concerning Environmental Statistics of March 14, 1980) ["UmweltstatistikG"], BGBl. I 311, amended Nov. 26, 1986, I BGBl. I 2089, § 2.

215. BzBIG. § 5.

216. BImSchG § 52.

217. BWaldG § 42.

218. Düngungsmittelgesetz § 8.

219. Gesetz über die Umweltverträglichkeit von Wasch- und Reinigungsmittel in der Fassung vom 5. März 1987 (Act on the Environmental Tolerance for Detergents and Cleaning Solvents as amended March 5, 1987) § 10.

220. *See* United States v. Trident Seafoods Corp., 60 F.3d 556 (9th Cir. 1995), concerning violation of state and federal law.

221. 42 U.S.C. § 7511a (Supp. 1994), discussed by RUSSELL E. ERBES, A PRACTICAL GUIDE TO AIR QUALITY COMPLIANCE 193 (2d ed. 1996), and reviewed by the author at 10 TULANE ENVTL. L.J. 457 (1997).

222. 15 U.S.C. § 2605 (1994); 40 C.F.R. § 720.1 (1992).

223. 33 U.S.C. § 1321 (1994); 40 C.F.R. Parts 116 and 117 (1995).

3. *Economic Measures*

Economic measures in general offer certain advantages over direct environmental regulation.²²⁴ Economic measures allow flexibility and reward innovation. They encourage reduction of pollution rather than signal satisfaction with prescribed levels. They often employ existing bureaucracies, such as taxing agencies, for their administration, increasing efficiency.²²⁵ Subsidies place the onus of initiative on the persons being regulated rather than on the enforcement bureaucracy. Also, in today's political climate, direct regulations might be viewed as "unfunded mandates" on industry and business, much like federal programs that impose costs on states, or legislation that requires employers to provide health and other benefits to employees. It is politically more palatable to reward and thereby encourage behaviors perceived by regulators as friendly to the environment (environmental subsidies) and to penalize and thereby discourage behaviors judged to be harmful (pollution charges). Together, these economic environmental methods commercialize atmospheric, aquatic, and terrestrial resources in order to internalize social costs.

In a broad sense, service charges for public water, sewer, and refuse collection might be said to belong to the law of the environment, especially if the fees are costly enough to have the effect of reducing consumption.²²⁶ But, if the discipline of environmental law is constrained as suggested in this article,²²⁷ then these public service charges fail to meet the requirement of having the protection of the natural environment as their *primary* purpose. Accordingly, public service charges belong to the discipline of environmental law only if they have as their primary purpose the

224. See generally Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law: The Democratic Case for Market Incentives*, 13 COLUM. J. ENVTL. L. 171 (1988). On the ethical issues surrounding environmental markets, see STEVEN KELMAN, *WHAT PRICE INCENTIVES?: ECONOMISTS AND THE ENVIRONMENT* (1981).

225. See Lisa Heinzerling, *Selling Pollution, Forcing Democracy*, 14 STAN. ENVTL. L.J. 300 (1995).

226. There is great disparity in water costs in Europe. In Denmark, the annual household cost of water is nearly 700 ECU. In Germany and Switzerland, it is over 600. In Italy it is under 100. *The European*, Aug. 24-30, 1995, at p. 3. The ECU, now called the Euro, had a value of \$1.17 in 1993. OFFICE FOR OFFICIAL PUBLICATIONS OF THE EUROPEAN COMMUNITIES LUXEMBOURG, EUROSTAT YEARBOOK '95: A STATISTICAL EYE ON EUROPE 1983-1993, at 240 (Luxembourg 1995).

227. See definition in text following note 39.

protection of essential resources from anthropogenic degradation.

German scholars²²⁸ and policy-makers²²⁹ have long understood and appreciated the advantages of economic measures. Nevertheless, they remain very rare in German law.²³⁰ The most prominent exemplar of an economic environmental method in Germany is the effluent charge imposed under the Effluent Charges Law of 1976.²³¹ Charges are assessed according to the amount and kind of effluent introduced into rivers and lakes,²³² and the resultant revenue is used to maintain or improve water quality by constructing new facilities and improving or protecting water quality in other ways.²³³ Occasionally, environmental charges are imposed to help fund special monitoring programs.²³⁴ An example of such charges is that imposed by the State of Hessen on disposal of waste requiring special monitoring.²³⁵ And the City of Kassel, in an action expected to be followed by other municipalities, recently imposed a disposal tax on single-use, fast-food containers.²³⁶ A final example can be cited from the realm of nature-protection legislation; the Federal Nature Protection Act requires that encroachments²³⁷ upon nature and the landscape be avoided

228. See e.g., FREY, *UMWELTÖKONOMIE* 113 *et seq.* (1972); CANSIER, *ÖKONOMISCHE GRUNDPROBLEME DER UMWELTPOLITIK* 98 *et seq.* (1975).

229. See *Umweltgutachten* 1978, at 544 *et seq.* BT-Dr 7/1938.

230. One example of a subsidy is that given producers of wind energy. Uta Heil, *Strom der Zukunft oder Windei?*, *Sueddeutsche Zeitung*, Oct. 17, 1995. European law allows Member States to subsidize no more than 15 percent of the installation of pollution control equipment. GEORGE A. BERMANN, ROGER J. GOEBEL, WILLIAM J. DAVEY, & ELEANOR M. FOX, *CASES AND MATERIALS ON EUROPEAN COMMUNITY LAW* 1105 (1993).

231. *Abwasserabgabengesetz* vom 13 Sept. 1976 (Effluent Charges Law of Sept. 13, 1976), I BGBl. 2721.

232. *Id.* § 4.

233. See *id.* § 13. See generally SALZWEDEL & WERNER, *supra* note 120, at 98 *et seq.* German law does not control agricultural non-point pollution caused by nitrates and pesticides. Jarass & DiMento, *supra* note 137, at 62.

234. On the constitutionality of such charges, see 82 *Entscheidungen des Bundesverfassungsgerichts* [BVerfGE] 159.

235. See *Hessische Sonder-Abfallabgabengesetz* § 1, mentioned in SCHLEMMINGER & WISSEL, *supra* note 13, at 241, and Lutz Horn et al., *Deutsches Umweltrecht in der Praxis* 194-95 (Claus-Peter Martens et al., eds. 1995).

236. See SCHLEMMINGER & WISSEL, *supra* note 13, at 242. The ordinance has been upheld by the state administrative appellate court (*Verwaltungsgerichtshof*). *Sueddeutsche Zeitung*, July 1, 1995.

237. See BNatSchG § 8 I, providing, "Encroachments upon nature and the landscape pursuant to this act are alterations in the appearance or use of land that may substantially or lastingly impair the productivity of the ecosystem or the landscape" (Eingriffe in Natur und Landschaft im Sinne dieses Gesetzes sind Veränderungen der Gestalt oder Nutzung von Grundflächen, die die Leistungsfähigkeit des Naturhaushalts oder das Landschaftsbild erheblich oder nachhaltig

or mitigated to the extent feasible.²³⁸ If avoidance or mitigation is not feasible, state nature protection agencies nevertheless may approve the encroachment upon payment of a fee.²³⁹

Economic measures are more common in the United States than in Germany. They take the form of subsidies, charges, and market measures, which in effect combine subsidies and charges. Subsidies are often, but not always, linked to regulatory programs to prevent or reduce pollution.²⁴⁰ The incentive of a loan from the World Bank is an example of an environmental subsidy not used in conjunction with a regulatory program. A federal grant in the United States to a municipality to build a sewage treatment plant to comply with standards under the Clean Water Act is an example of an environmental subsidy that is tied to a regulatory program. Subsidies often take the form of tax reductions tied to the purchase and installation of pollution-control devices, solar-heating systems, and heat-regeneration equipment. In the area of nature conservation, most states employ tax incentives to promote continuation and expansion of forestry uses.²⁴¹ Sometimes the subsidies are paid directly, rather than in the indirect form of tax incentives. One example is the reimbursement for low-water-usage toilets in San Diego County.²⁴²

beeinträchtigen können).

238. *See id.* § 8 II, providing, "The person causing an encroachment shall be obligated to avoid impairments upon nature and the landscape as well as to mitigate unavoidable impairments within a period to be specified by nature and landscape conservation measures to the extent necessary to attain the objectives of nature protection and landscape management An encroachment is [considered] mitigated when no substantial or lasting impairments of the ecosystem remain after its completion, and the landscape is appropriately restored or re-landscaped" (Der Verursacher eines Eingriffs ist zu verpflichten, vermeidbare Beeinträchtigungen von Natur und Landschaft zu unterlassen sowie unvermeidbare Beeinträchtigungen innerhalb einer zu bestimmenden Frist durch Maßnahmen des Naturschutzes und der Landschaftspflege auszugleichen, soweit es zur Verwirklichung der Ziele des Naturschutzes und der Landschaftspflege erforderlich ist Ausgeglichen ist ein Eingriff, wenn nach seiner Beendigung keine erhebliche oder nachhaltige Beeinträchtigung des Naturhaushalts zurückbleibt und das Landschaftsbild landschaftsgerecht wiederhergestellt oder neu gestaltet ist).

239. *See also* the possibility of exacting a forest conservation fee from those who convert forestland to other purposes. *E.g.*, Baden-württembergisches Waldgesetz § 9 IV, discussed in THOMAS LUNDMARK, *LANDSCAPE, RECREATION, AND TAKINGS IN GERMAN AND AMERICAN LAW* 273-74 (1997).

240. Subsidies are not apposite for all environmental activities. They are best suited to offset costs, such as those of acquiring equipment, or landscaping with plants.

241. *See* Lundmark, *supra* note 18, at 797-801.

242. *See* Steve LaRue, *Residents Snap up Low-flow Toilet Rebates*, THE SAN DIEGO UNION-TRIBUNE, Feb. 13, 1995, at B-8.

In lieu of, or in addition to, the foregoing methods, governments can require payment of penalties or fees for private activities that generate external costs. In this way, the government "sells" the public's atmospheric, aquatic, and terrestrial resources. The money thus raised can be employed to mitigate resulting environmental harm. This method can readily be applied to identifiable industries, such as dry cleaners and printers, but it involves enforcement problems similar to those encountered in direct regulation. Sometimes it requires the installation of on-site equipment to gauge pollution. Environmental insurance²⁴³ and waste-disposal fees are examples of environmental charges, at least if the cost is set for the primary purpose of protecting the natural environment. Another everyday example is the deposit paid on returnable bottles,²⁴⁴ which in effect imposes a charge on improper disposal. Taxes can be imposed on gasoline to reduce consumption and therefore lessen air pollution, and higher taxes can be exacted on automobiles that pollute more.²⁴⁵ Environmental charges are occasionally assessed in the United States to discourage conversion of natural property to agricultural and other uses.²⁴⁶

Tradable rights programs for environmental management in theory allow regulated entities to allocate their resources in order to achieve the requisite level of environmental compliance according to their individual abilities and preferences. This results in lowering the cost of compliance and presumably increases the entities' acceptance of environmental regulation.²⁴⁷ Also, by allowing firms to engage in market activity to avoid compliance costs, tradable rights programs may even provide an incentive for regulated entities to improve environmental performance.²⁴⁸ The

243. See generally Christopher D. Stone, *Beyond Rio: "Insuring" Against Global Warming*, 86 AM. J. INT'L L. 445 (1992). The American "super fund" sites are applications of the polluter-pays policy. See 42 U.S.C. § 9607 (1994).

244. See e.g., 74 MASS. GEN. LAWS ANN. ch. 94, § 65T (West 1991).

245. Such a tax is being considered in Germany. *Ökosteuer: Aber Wie?* ADAC Motorwelt, Dec. 1995, at 46.

246. See e.g., NEV. REV. STAT. ANN. §§ 528.040-528.090 (1986) (allows imposition of conditions on owners who convert forestland to non-timber-producing purposes). Another environmental charge is a requirement that loggers screen clearcut areas from public view. E.g., 14 Cal. Code Regs. § 927.13 (1995). This requirement raises the cost of, and thus tends to discourage, the unpopular clearcutting.

247. See David Sohn & Madeline Cohen, Note, *From Smokestacks to Species: Extending the Tradable Permit Approach from Air Pollution to Habitat Conservation*, 15 STAN. ENVTL. L.J. 405, 409 (1996).

248. See Daniel J. Dudek et al., *Environmental Policy for Eastern Europe: Technology-Based Versus Market-Based Approaches*, 17 COLUM. J. ENVTL. L. 1,

most prominent example of a tradable rights program is that provided under the Clean Air Act.²⁴⁹ This method is employed in the Los Angeles area²⁵⁰ to reduce air pollution.²⁵¹ More recently, commentators have advocated extending this environmental management method to other environmental goals, such as protection of endangered species.²⁵²

4. *Voluntary Programs*

Public-education campaigns against the use of harmful propellants and recycling programs belong in the fourth category of environmental methods, voluntary actions. Voluntary actions can be extremely successful if three conditions are met: (1) people are convinced that the program is worthwhile; (2) compliance is relatively easy and cheap (in time, effort, or money); and (3) people feel that everyone else who is similarly situated is also complying.

Compliance by the public with the recycling provisions of the Regulation on the Avoidance of Packaging Waste²⁵³ illustrates the potential effectiveness of voluntary programs. Germans have been informed of bulging city dumps and are assessed a fee per waste container employed by municipal trash disposal agencies. The recycling containers are free, and they are relatively convenient to use. They are found outside apartment buildings and in front of many establishments selling items in recyclable packaging. The program has popular support. The success of this program in mobilizing the public in Germany provides compelling proof of the power of this method of environmental policy. And voluntary

8 (1992).

249. The Clean Air Act Amendments of 1990 establish annual allowances for sulphur dioxide emissions from coal-burning electric utilities and permit trading of allowances among utility units. See 42 U.S.C. §§ 7651b-7651e (1994).

250. For a discussion of the South Coast Air Quality Management District's Regional Clean Air Incentives Market (RECLAIM) program, see Matthew Polesetsky, *Will a Market in Air Pollution Clean the Nation's Dirtiest Air? A Study of the South Coast Air Quality Management District's Regional Clean Air Incentives Market*, 22 *ECOLOGY L.Q.* 359 (1995).

251. For one of many articles on this topic, see John P. Dwyer, *The Use of Market Incentives in Controlling Air Pollution: California's Marketable Permits Program*, 20 *ECOLOGY L.Q.* 103 (1993).

252. See Sohn & Cohen, *supra* note 247. For a general overview of market-based proposals for endangered species protection, see Jim McKinney & Mark Shaffer, *Economic Incentives to Preserve Endangered Species Habitat and Biodiversity on Private Lands*, in *BUILDING ECONOMIC INCENTIVES INTO THE ENDANGERED SPECIES ACT 1* (Wendy E. Hudson ed., 1994).

253. Discussed *supra* at notes 193 through 199.

programs have the advantage of being inexpensive and avoiding use of compliance agencies and courts.

Exhortative strategies²⁵⁴ have appealed to the American citizenry to recycle bottles and paper, to drive autos less, and to walk and bicycle more, to use roll-on deodorants instead of aerosols,²⁵⁵ and to forego Christmas lights during the Oil Crisis. In some legislative schemes for the protection of natural areas, state officials maintain a registry of land belonging to owners who have agreed to retain their land in its natural condition.²⁵⁶

5. *Environmental Assessment*

The Law Providing for Environmental Impact Assessment²⁵⁷ was enacted by the German Parliament to implement the European Directive,²⁵⁸ which was in turn inspired by the environmental impact statement requirements of the National Environmental Policy Act (NEPA).²⁵⁹ Unlike NEPA, German environmental assessment is applied only to concrete projects for which a permit is required, not to general planning activity or regulations.²⁶⁰ The project must be of a nature described in an appendix to the law, which covers projects that can have substantial effects on the environment.²⁶¹ The appendix includes citing of, and significant changes to, nuclear power plants,²⁶² major landfills, federal highways, airports, hotel complexes, and oil and gas pipelines.

254. Professor Ellickson finds a number of property regimes, founded on principles of neighborliness, that are informal, essentially voluntary, and draw little or no support from coercive legal systems. Robert Ellickson, *Of Coase and Cattle: Dispute Resolution Among Neighbors in Shasta County*, 38 STAN. L. REV. 623, 672-77 (1986).

255. See Carol Rose, *Rethinking Environmental Controls: Management Strategies for Common Resources*, 1991 DUKE L.J. 1, 30 (1991).

256. See e.g., TENN. CODE ANN. §§ 11-14-101 to 11-14-116 (1992). Landowners are not given any incentive other than the registry of their land in the system. See *id.* § 11-14-112.

257. Gesetz über die Umweltverträglichkeitsprüfung vom 12. Feb. 1990 (Law Providing for Environmental Impact Assessment of Feb. 12, 1990) I BGBl. 205.

258. See WILFRIED ERBGUTH & ALEXANDER SCHINK, GESETZ ÜBER DIE UMWELTVERTRÄGLICHKEITSPRÜFUNG at V (1992).

259. See 42 U.S.C. § 4331.

260. See Jarass & DiMento, *supra* note 137, at 64.

261. See § 3 UVPG (erhebliche Auswirkungen auf die Umwelt haben können).

262. Germany gets over one quarter of its power from nuclear power plants, compared to 10 percent in the United States. EUROSTAT YEARBOOK '95, *supra* note 226, at 370.

The purpose of the Law Providing for Environmental Impact Assessment is to ensure that the responsible agency, in a timely and comprehensive manner, discerns, describes, and evaluates environmental impacts according to uniform standards; and further, that the agency consider the results of the assessment in its decision-making.²⁶³ This corresponds closely to the declared purposes of environmental impact reporting under NEPA²⁶⁴ and to the purposes of legislation known as "Little NEPA's" enacted in sixteen states, the District of Columbia, and Puerto Rico.²⁶⁵ NEPA's environmental assessment procedures potentially apply to all "major Federal actions."²⁶⁶ This definition embraces transactions between private persons and federal governmental agencies, as well as private activities that require federal governmental permission or assistance. Examples include applications from private applicants for federal licenses and permits; the granting of loans, grants, and assistance to private parties; entering into agreements, leases, and conveyances with private parties; and approvals of rights of way.²⁶⁷ Thus, under NEPA, as under its German counterpart, only activities with some governmental involvement are candidates

263. "Zweck dieses Gesetzes ist sicherzustellen, daß bei den in der Anlage zu § 3 aufgeführten Vorhaben zur wirksamen Umweltvorsorge nach einheitlichen Grundsätzen

1. die Auswirkungen auf die Umwelt frühzeitig und umfassend ermittelt, beschrieben und bewertet werden,
2. das Ergebnis der Umweltverträglichkeitsprüfung so früh wie möglich bei allen behördlichen Entscheidungen über die Zulässigkeit berücksichtigt wird." § 1 UVPG.

264. See NEPA's statement of purpose, *supra* note 55.

265. See David Sive & Mark A. Chertok, "Little NEPA's" and Their Environmental Impact Assessment Processes, SA85/3 ALI-ABA 1197, June 24, 1996.

266. NEPA requires that "all agencies of the Federal Government . . . include [an EIS] in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C) (1994). According to regulations promulgated by the Council on Environmental Quality, "Major reinforces but does not have a meaning independent of significantly." 40 C.F.R. § 1508.18 (1992).

267. See RODGERS, *supra* note 15, at 897-98. *E.g.*, Calvert Cliffs' Coordinating Comm., Inc. v. United States Atomic Energy Comm'n, 449 F.2d 1109 (D.C. Cir. 1971) (application for federal license); Conservation Council of N.C. v. Costanzo, 39 8 F. Supp. 653 (E.D.N.C. 1975), *aff'd*, 528 F.2d 250 (4th Cir. 1975) (application for federal permit, holding that wetlands that are periodically inundated by tidal waters are "waters of the United States"). Projects that require only state or local approval, such as most applications for zoning changes and construction permits, are subject to state environmental impact laws. See *Friends of Mammoth v. Bd. of Supervisors*, 8 Cal. 3d 247, 104 Cal. Rptr. 761, 505 P.2d 1049 (1972), discussed in Renz, *The Coming of Age of State Environmental Policy Acts*, 5 Pub. Land L. Rev. 31 (1984).

for compulsory preparation of an environmental impact statement.²⁶⁸ The appendix employed in the German legislation is a departure from American practice. Instead of listing projects, NEPA employs the much litigated phrase that requires preparation of an EIS for proposed actions "significantly affecting the quality of the human environment."²⁶⁹

6. *Proprietary Governmental Action*

Proprietary governmental action, the sixth method, takes many forms. In the area of natural resource conservation, governmental entities acquire or husband natural areas, such as parks and forests.²⁷⁰ Proprietary governmental action is seen at work in sewage-treatment plants, public trash collection, operation of landfills, and clean-up of toxic sites, such as the 12 billion German marks (\$ 7.7 billion) project to restore lignite mining sites in eastern Germany.²⁷¹ This category can also be used to include funding of research, educational programs, and universities.

Conclusion

The environment is more complicated than we know. As we sound, and falteringly fathom, natural processes, we continue to be amazed at their complexity and interrelatedness. In light of this complexity, it is incumbent upon scholars to clarify and simplify. While the environment may be exquisitely complex, environmental law need not and should not be so.

It probably goes without saying that one cannot design strategies to protect an object unless one has a clear idea what that object is. Therefore, the first step in the simplification and systematization of the law of the environment is to give serious thought to the subject matter of the legal regime, that is, to what is

268. The statement apparently to the contrary in Jarass & DiMento, *supra* note 137, at 64-65, is misleading. ("[E]nvironmental impact assessments are required not only of federal or state agencies as in the United States, but also of every person applying for a permit for projects of specific importance to the environment."). State requirements are similar. *E.g.*, California Environmental Quality Act, Cal. Pub. Res. Code § 21000 *et seq.* (West 1986).

269. 42 U.S.C. § 4332(2)(C) (1994).

270. Natural areas and parks in Germany are usually in private ownership in Germany, unlike in the United States. LUNDMARK, *supra* note 239, at 7.

271. Current Report, 17 Int'l Env'tl. Rptr. Current Rep. 1937 (1994). On the failure of the German Democratic Republic to protect environmental quality, see Maria J. Ionata, *German Unification and European Community Environmental Policy*, 14 B.C. INT'L & COMP. L. REV. 344 (1991).

meant in the legal context by the term "environment." In this endeavor, definitions from other disciplines, such as ecology, are not necessarily useful. Law requires for its elaboration and development a succinct definition, one that does justice to the complexity of the environment but also to the existence of other legal disciplines and to the pragmatic tasks facing legislators, government officials, lawyers, and judges. The author recommends a tripartite definition of environmental law inspired by German thinkers:

Environmental law is the totality of all legal measures that have as their primary purpose the protection or the enhancement of resources that are essential to human life (atmosphere, water, and land), the prevention or minimization of pollution, and the conservation of components of nature, including forms of life not unreasonably injurious to humans.

Even if the proposed definition of the author does not find universal acceptance, it is hoped that it will spur Americans to examine and delimit the scope of the law for protection and enhancement of environmental quality.

The second step in the process of systematization is to isolate overriding policies that guide our thinking about how much protection should be accorded, whom the measures should be addressed to, and who should be involved in the rule-making process. The triad of policies discussed in the article (precautionary, polluter-pays, and cooperation) assist in this process. These policies are not hard and fast rules for ready application. Rather, they direct the dialogue along agreed-upon paths.

After the object of protection has been identified and the level of protection and other policies have been agreed upon, the task turns to selection of appropriate means of achieving the desired level of protection. Here it is essential to realize that, as complex as the environment may be, there is but a finite number of legal measures or methods at our disposal. These methods can be grouped as recommended in this article as follows: private rights, direct regulation, economic measures, voluntary programs, environmental assessment, and proprietary governmental action. Each method has certain strengths and weaknesses, depending on the problem to be addressed, the level of protection sought, and the process chosen. There are numerous tools available. A comprehensive program to protect and enhance the environment should give consideration to them all.

