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I. INTRODUCTION

The assignment of tasks to the appropriate level of government is an important aspect of environmental policy design. Because the costs and benefits of pollution control policies are closely tied to geography, political solutions should reflect the underlying spatial structure of environmental problems. These solutions should not only incorporate the long-distance effects of air and water pollution, but also account for the mobility of economic actors and the resource base of governments.

There are three general types of environmental problems. Global issues have no complex geographical component. Regional problems arise when political boundaries do not coincide with the

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pollution's geographical impact. The environmental effects of local issues are confined within existing governmental borders.

After outlining the political-economic arguments for the division of regulatory authority, I examine the actual pattern in two concrete cases: the United States and Germany. Both have advanced capitalist economies governed by representative federal democracies. They have similar levels of economic development and energy use and similar types of pollution problems. Both are viewed as environmental leaders. Public and private spending on environmental protection is high.[1] Germany is, however, much smaller in area and population and is much more densely populated. It is embedded in the European continent, and its economy depends heavily on cross-border trade.[2] Conditions in other European countries affect the quality of Germany's air and water.[3]

American and German federalism have different structures, and this difference has had an impact on environmental policy. American federalism gives a strong role to federal officials in the administration of environmental laws, though in practice the states

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1. Expenditures for pollution abatement and control in the United States totaled $85.9 billion in 1988, of which 21% was spent by governments. Council on Environmental Quality, *Environmental Quality: 21st Annual Report* 271, Table 9 (1991) ("*CEQ Report*"). Of the 65.71 quadrillion Btu of energy produced in the United States in 1989, 32.31% was from coal, 26.7% natural gas, 27.9% crude oil and liquid natural gas, 4.2% hydroelectric, 8.7% nuclear, and 0.19% from other sources. Most American coal is bituminous. Id. at 290, Table 16. Only 9% of 1989 U.S. coal production was lignite. Id. at 291, Table 17. Per capita energy consumption in 1990 was 341 million Btu. Id. at 298, Table 24. (One Btu is 1.055×10^8 joule.)

Public spending on the environment in Germany totaled DM 17.4 billion or approximately $10 billion in 1988, of which DM 8.3 billion was for investments, mostly in sewage treatment and waste disposal. Spending by business on both investments and operating costs totaled approximately DM 18 billion, of which about DM 8 billion was investment. Energy consumption was 11,500 quadrillion joules in the western *Länder* (Germany's equivalent of states) in 1989. The proportions were 27% from coal (8% lignite), 17% natural gas, 40% oil, 12% nuclear, and 3% other. Umweltbundesamt, *Daten zur Umwelt 1990/91* at 19 (Erich Schmidt, 1992). In the east, consumption was 4,000 quadrillion joules with two-thirds from lignite. Id. at 21.

2. The population of the United States was 250.4 million in 1990. Population density was 26.7 people per square kilometer. Gross domestic product (GDP) in 1989 was $5,132 billion in current dollars or about $20,600 per capita. Exports and imports were approximately 10% of GDP. OECD, *OECD in Figures: Statistics of the Member Countries* 7, 27 (1991) ("*OECD in Figures*"); *CEQ Report* at 263 (cited in note 1).

Germany at the end of 1990 had a population of 79.6 million, of which 15.9 million lived in the former German Democratic Republic. Germany had a population density of 223 people per square kilometer. GDP in the western *Länder* was $1,189.2 billion in 1989 or $19,200 per capita. Import and export volumes were nearly one quarter of GDP. *OECD in Figures* at 6, 26; Rudolph Bauer, Sebastian Klinke, and Stefan Pabst, *Meeting Needs in Germany* 4 (U. of Bremen Inst. for Local Social Policy and Nonprofit Orgs., 2d ed. 1992).

3. See Umweltbundesamt, *Daten zur Umwelt 1990/91* at 214-19 (cited in note 1) (showing the volume of sulfur and nitrogen oxides transported in and out of the western and eastern parts of Germany). Countries to the north and west generally export more than they import and those to the east and south import more than they export.

carry out much of the day-to-day implementation. Earmarked matching grants and federal oversight of state efforts provide high levels of central influence. In contrast, the German federal system delegates implementation to the states and localities with federal statutes, regulations, and guidelines providing the regulatory structure. For some environmental issues only federal framework statutes are permitted, giving the states considerable independent lawmaking authority. Earmarked intergovernmental grants are unimportant and face constitutional limits, but federal subsidies and tax breaks for industry are a recoguized aspect of environmental policy.

Although both Germany and the United States have recognized the complex geographical character of environmental problems, neither has done an adequate job of matching problems to government structures. To oversimplify, Germany seems too decentralized and the United States too centralized. Part of the problem derives from the countries' respective constitutional structures, but much of it is a by-product of substantive environmental law.

II. GLOBAL AND REGIONAL PROBLEMS

Global problems occur when the benefits of environmental protection depend on the world level of beneficial or harmful substances produced, irrespective of their geographical distribution. No pollution problem fits this category perfectly, but the depletion of the ozone layer and global warming come close.[4] So, too, does protection of endangered species if one perceives risks to the entire world from a decline in the variety of life forms.[5]

Global problems can be described in apocalyptic terms, but their economic properties are simple. Once scientific estimates of the

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4. See Anne Gallagher, *The "New" Montreal Protocol and the Future of International Law for Protection of the Global Environment*, 14 Houston J. Int'l L. 267, 270-77 (1992) (discussing the problems of depletion of the ozone layer). For a treatment of global warming, see generally Richard Morgenstern, *Toward a Comprehensive Approach to Global Climate Change*, 81 Am. Econ. Rev.-Papers & Proc. 140 (1991), and William Nordhaus, *A Sketch of the Economics of the Greenhouse Effect*, 81 Am. Econ. Rev.-Papers & Proc. 146 (1991).

5. David Pearce estimates that if each "adult person in wealthy countries of the world [Western Europe, North America, Australia] would be willing to contribute $8 per annum to an 'Amazon Conservation Fund,' the resulting $3.2 billion would enable the people responsible for more than 25 per cent of the economic output of Amazonia te be compensated for ceasing their activities." David W. Pearce, *An Economic Approach to Saving the Tropical Forests*, in Dieter Helm, ed., *Economic Policy Towards the Environment* 239, 259 (Blackwell, 1991). Pearce considers $8 to be a conservative estimate of the value placed on rain forest species. Id. at 258.

link between discharges and damages are made, policymakers must set a global level of allowable discharge and design a system to distribute costs among the responsible parties and deep pockets of the world.[6] One possible solution is a system of pollution rights by which the generators of harmful substances either purchase the right to discharge limited amounts or else engage in cleanup activities.[7] If some dischargers are located in countries that are poor or otherwise especially worthy, these countries can receive pollution rights that they can use for their own producers or sell on the world market.[8] Although many scientific issues remain unresolved and the political problems are complex and often intractable, the economic analysis is clear cut.

The greatest political and analytic difficulties occur when pollution damages depend on geography, meteorology, or the properties of bodies of water. Most air and water pollution falls into this category of regional problems. It is not enough to know the total volume of sulfur dioxide discharged into the air or the amount of domestic sewage emptied into the water. One must also know where the wind and water carry discharges, how they combine with other pollutants, and how the populations of people, trees, and wildlife are distributed relative to the distribution of pollution. The optimal level of cleanup may vary by location.[9] The distribution of causes and effects over geographic areas does not respect political boundaries.

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6. Some policies involve limiting uses, such as banning the use of chlorofluorocarbons in spray cans to protect the ozone layer. Daniel F. McInnis, *Ozone Layers and Oligopoly Profits*, in Michael S. Greve and Fred L. Smith, Jr., eds., *Environmental Politics: Public Costs, Private Rewards* 129, 145-50 (Praeger, 1992). Such regulations prejudge the relative importance of various uses rather than leave it to the market to allocate the reduced supply through higher prices.

7. Thomas H. Tietenberg, *Economic Instruments for Environmental Regulation*, in Dietor Helm, ed., *Economic Policy Towards the Environment* 86, 88-90 (cited in note 5). See generally Alan S. Manne and Richard G. Richels, *International Trade in Carbon Emission Rights: A Decomposition Procedure*, 81 Am. Econ. Rev.-Papers & Proc. 135 (1991) (analyzing a system of carbon emission rights to control greenhouse warming); Amy C. Christian, *Designing a Carbon Tax: The Introduction of the Carbon-Burned Tax (CBT)*, 10 UCLA J. Envir. L. & Policy 221 (1992) (analyzing a carbon tax).

8. For an attempt to develop such a scheme, see generally Adam L. Aronson, Note, *From "Cooperator's Loss" to Cooperative Gain: Negotiating Greenhouse Gas Abatement*, 102 Yale L. J. 2143 (1993). Such proposals, of course, have a somewhat utopian air because no global authority exists that is capable of administering such a program. See Scott Barrett, *The Problem of Global Environmental Protection*, in Helm, ed., *Economic Policy Towards the Environment* 137, 146-54 (discussing how global cooperation can arise under certain conditions).

9. For example, Dallas Burtraw and Paul Portney report that, in Baltimore, the economically efficient standard for total suspended particulates (that is, the point where marginal benefits equal marginal costs) is nearly 50% greater than the optimal standard for St. Louis. Dallas Burtraw and Paul R. Portney, *Environmental Policy in the United States*, in Helm, ed., *Economic Policy Towards the Environment* at 289, 311.

Economic theory provides a straight-forward, but unrealistic, answer to the problem: draw "optimal" jurisdictional boundaries. Since the states have little incentive to consider benefits and costs that accrue to out-of-state residents, the government should create special purpose authorities with jurisdictional boundaries designed to internalize external effects.[10] For example, a single authority should regulate upstream and downstream water users. Dischargers and breathers in a single air basin should be included in the same jurisdiction.

As a practical matter, this principle leads to an unmanageable number of overlapping governmental entities, forcing a search for second-best solutions. Federal matching-grant programs are one option. Without creating new government authorities or redrawing boundaries, grants could give states and localities an incentive to take responsibility for the external effects of their pollution.[11] Conversely, instead of subsidizing pollution control, the federal government could tax states on their interstate emissions. For example, states could be charged fees based on the volume of pollutants in water that crosses state lines. Managing externalities, thus, provides a normative argument for incentive-based cooperative federalism.

Implementing matching-grant programs or tax systems under this principle would be a complex enterprise. The federal government cannot simply set a single matching rate or unit tax. Most interstate externalities are asymmetric. One group of states—upstream polluters or energy-producing states—imposes costs on other states—downstream water users or energy-using states—without reciprocation. This circumstance means that states should face different tax or matching rates depending on the degree of interstate externality.

III. LOCAL PROBLEMS

Local problems are confined within existing political boundaries. At first glance, it seems obvious that decision-making authority should devolve to low-level governments for such problems as noise,

10. See generally Wallace E. Oates, *Fiscal Federalism* 16-20, 31-53 (Harcourt Brace Jovanovich, 1972); Mancur Olson, Jr., *The Principle of "Fiscal Equivalence": The Division of Responsibilities Among Different Levels of Government*, 69 Am. Econ. Rev.-Papers & Proc. 479 (1979) (arguing that a majority of state legislatures should be able to veto federal legislation).

11. See generally Albert Breton, *A Theory of Government Grants*, 31 Canadian J. Econ. & Pol. Sci. 175 (1965); Oates, *Fiscal Federalism* at 65-118.

local parks, and waste dumps. Each community would weigh the costs and benefits of various degrees of environmental protection and choose the one that fits its tastes and pocketbook.

Devolution must, however, be done with care. The national government must establish a framework for local decision-making processes and act when the benefits of standardized solutions outweigh the advantages of local control. Economies of scale in production and the mobility of regulated firms and households may require centralized policy making.

Consider, first, economies of scale. Federal action may be justified if the costs of diverse local rules outweigh the benefits. Uniform national regulation may produce economies of scale of production and distribution for firms with national markets. Federal preemption may also reduce search costs for firms seeking new production and distribution locations. The argument for centralized standards is strengthened if local governments use idiosyncratic rules to benefit local enterprises at the expense of citizens and national corporations.[12] Federal product standards need not, however, preempt local restrictions entirely. Thus, a federal standard on the noise produced by motorcycles or power tools could be combined with local rules limiting nighttime use and restricting the places where noise may be produced. Local governments would, however, be prohibited from making rules that directly contradict the federal standard.

Second, consider mobility and its interaction with property rights. Efficient plant location choices require a uniform system of property rules, but state and local environmental regulations can affect entitlements. To illustrate the problem, suppose one local government levies a tax on those who generate loud noises. The tax is levied per decibel of noise produced per hour. A second town directly regulates the level of noise and imposes fines on violators. Consider a

12. For example, in the American chemical industry, national firms appear to have a relatively weak bargaining pesition at the state level: Moving costs are high once capital is in place, and the industry is very capital intensive. Large chemical companies have, thus, actively supported uniformity in a number of regulatory areas. The chemical industry joined with the Occupational Safety and Health Administration ("OSHA") in support of uniform national labeling standards. Jerry L. Mashaw and Susan Rose-Ackerman, *Federalism and Regulation*, in George C. Eads and Michael Fix, eds., *The Reagan Regulatory Strategy: An Assessment* 111, 133-34 (Urban Inst., 1984). Under the Resource Conservation and Recovery Act, the Chemical Manufacturers Association ("CMA") favored uniform federal standards. The CMA worried that "[v]ariations in state priorities could result in cost disadvantages for existing facilities due to geographic location." David Schnapf, *State Hazardous Waste Programs under the Federal Resource Conservation and Recovery Act*, 12 Envir. L. 679, 712 n.136 (1982) (citing *Comments of the Chemical Manufacturer's Association on EPA's Proposed Consolidated Permit Regulations #189* at 179-80 (Sept. 12, 1979)).

noise producer that would meet the second town's standard in whichever town it locates.[13] If the noise producer is mobile and can shift towns without cost, it will locate in the second town. It avoids the tax levied in the first town with no change in noise produced. From the standpoint of efficiency, the firm should be indifferent between the two towns, but, in fact, it is not. The different policy tools chosen affect location decisions in inefficient ways. Town one's noise fee, though levied on a per decibel basis, acts like a tax on locating in town one. To avoid such outcomes, the central government should specify the type of policy (i.e. taxes or standards) and leave it to the local governments to decide on the appropriate level. Otherwise, local governments would be deciding both the level of noise and the property entitlements of noise producers.

This problem of property entitlements has generally been ignored in the debate over whether jurisdictions are in a race to the bottom or a race to the top when they use regulatory policy to compete for business. Most theoretical work on interjurisdictional competition assumes that the basic policy instrument has been fixed *a priori*. Jurisdictions are only free to decide on its level.[14] For example, if effluent fees are the policy tool, each local government decides what fee to set. Each one trades off environmental cleanliness against jobs in a way that reflects the preferences of that community's residents. Under strong competitive assumptions for both communities and businesses, the result of interjurisdictional competition will be an efficient allocation of jobs and pollution loads.[15] If, however, some communities set standards for individual firms while others assess effluent fees, the efficiency of the final result is compromised as firms seek to avoid paying fees.

If the problem being regulated is pervasive, however, land rents in the first community, which imposes charges, will fall, reflecting its more expensive regulatory environment. Land rents will

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13. In other words, the tax in town one has heen set to give the noise producer an incentive to reach the noise level mandated in town two.

14. See, for example, Wallace E. Oates and Robert M. Schwab, *Economic Competition Among Jurisdictions: Efficiency Enhancing or Distortion Inducing?*, 35 J. Puh. Econ. 333, 336 (1988). Oates and Schwah assume that each community sets the ratio of emissions to labor force. They note that the results would not be changed "if communities use certain other policy tools such as taxes on emissions rather than the command and control strategy." Id. at 336 n.2. They do not, however, consider the case in which some communities use fees and others use standards.

15. See id. These authors go on to consider cases where efficiency does not prevail. The recent theoretical articles are summarized for a legal audience in Richard L. Rovesz, *Rehabilitating Interstate Competition: Rethinking the "Race-to-the-Bottom" Rationale for Federal Environmental Regulation*, 67 N.Y.U. L. Rev. 1210 (1992).

adjust so that marginal producers are indifferent between the two communities. This result, although an equilibrium, will not generally be efficient. The differing land rents will produce divergent investment choices for businesses and residents in each town even if the underlying real economic factors are equivalent. Only a lump-sum tax in the second town, or a subsidy in the first, would successfully neutralize the impact of tool choice, and it seems unlikely that towns would be able to coordinate their efforts to set the correct fees and subsidies.

The ability of states to act as "laboratories" for innovative policies may also be undermined by firms' preferences for standards versus equally restrictive fees. Supporters of decentralized regulatory policy point to the advantage of encouraging experimentation at state and local levels. New ideas can be tested on a small scale, and other jurisdictions can copy successful initiatives.[16] This view of federalism can be criticized on a number of grounds,[17] but it is especially problematic in the face of interjurisdictional business mobility. A state-level property rights solution that reduces the profits of firms cannot receive a fair test under these conditions. Businesses will fail to locate in the experimenting jurisdiction, not because the implementation strategy is inefficient or ineffective, but simply because they will earn lower profits than in a jurisdiction using equally stringent command-and-control regulation.

In principle, this problem with market schemes could be corrected through appropriate lump sum transfers, but once again, it seems highly unlikely that jurisdictions will take steps to assure that businesses earn the same level of excess profits everywhere. Without such a compensatory policy, land rents will fall in the experimenting jurisdiction to offset the increased cost of doing business there, but such a shift in prices will hamper efforts to evaluate the policy

16. "It is one of the happy incidents of the federal system that a single courageous State may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country." *New State Ice Co. v. Liebman*, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting). See also the statement of Robert Meriam, Chairman, U.S. Advisory Commission on Intergovernmental Relations, *American Federalism: Toward a More Effective Partnership* 2 (Nat'l Conf. of Am. Federalism in Action, 1975). The benefits of injurisdictional competition in the development of corporate law are defended in Ralph K. Winter, Jr., *State Law, Shareholder Protection, and the Theory of the Corporation*, 6 J. Legal Stud. 251 (1977).

17. See generally Susan Rose-Ackerman, *Risk Taking and Reelection: Does Federalism Promote Innovation?*, 9 J. Legal Stud. 593 (1980) (arguing that few politicians have strong incentives to support risky innovations and that those who do will not design "experiments" with scientific validity). See also Steven G. Gey, *The Political Economy of the Dormant Commerce Clause*, 17 N.Y.U. Rev. L. & Soc. Change 1, 72 (1989-90) (arguing that Brandeis is expressing a common myth idealizing small-scale democracy).

experiment in efficiency terms. The behavior of firms will reflect both the efficiency benefits of the new policy and its impact on property entitlements.

Unfortunately, the debate over the efficacy of interjurisdictional competition cannot be resolved simply by requiring the central government to determine a background regulatory framework. Suppose, for example, that the federal government supports effluent fees, but permits individual states to select the fee levels. This strategy will solve the problem of interjurisdictional differences in property entitlements, but it may not avoid a race to the bottom. A "prisoners' dilemma" may still operate in which individually rational actions produce a result that is worse for state governments than a uniform national fee.[18]

To see how this can happen, consider a case in which economic rents or excess profits exist. Interjurisdictional competition favors relatively mobile groups in this situation.[19] Business firms that can invest in any state have a bargaining advantage over immobile citizens. Firms with little fixed capital, or companies that can credibly threaten to go out of business, also have a political advantage over ordinary voters. Governments may try to outdo each other in offering low levels of environmental regulation. If one government charges a low fee for waste disposal and another requires waste generators to pay high fees, mobile waste producers will flock to the low-cost jurisdiction. The transfer will continue until wages, land rents, and other costs in the low-fee jurisdiction rise enough to compensate for the cost advantage in waste disposal. Thus, some state and local officials may support federal laws that limit interstate competition. Because states will also have an incentive to undercut each other at the implementation stage, state officials may also support federal enforcement efforts.[20]

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18. For a discussion of the way a "prisoners' dilemma" operates when local governments compete, see Mashaw and Rose-Ackerman, *Federalism and Regulation* in Eads and Fix, eds., *The Reagan Regulatory Strategy* at 117-18, 122-32 (cited in note 12); Rovesz, 67 N.Y.U. L. Rev. at 1213-27 (cited in note 15); Susan Rose-Ackerman, *Rethinking the Progressive Agenda: The Reform of the American Regulatory State* 166-70 (Free, 1992).

19. "The attraction of decentralization is that it disperses political power. But concerted private interests have typically found it easy to counter dispersed political pewer. . . . [A] decentralized political structure [is] vulnerable to challenge by . . . concentrations of wealth . . . as well as to challenges by multinationals. . . ." Gey, 17 N.Y.U. Rev. L. & Soc. Change at 75 (cited in note 17). See also id. at 56-60 (characterizing the situation as a "battle" between states and large corporations).

20. The prisoners' dilemma may not, however, be very important for environmental pelicy. The evidence suggests that interstate differences in policy are not a major determinant of firm location because interstate differences in pollution control costs are a relatively small share of industrial siting costs. For evidence, see generally Timothy J. Bartik, *The Effects of*

Some argue, however, that interjurisdictional competition over environmental standards is likely to be efficient when cross-border externalities do not exist.[21] Several existing theoretical models generate this result.[22] The most important feature of these models is the lack of economic rents or excess profits in equilibrium. Thus, in these models, interjurisdictional differences simply reflect differences in preferences. If businesses do not operate in a perfectly competitive business environment, however, some of their excess profits can be transferred to local jurisdictions in the form of higher levels of environmental quality. Although a tax on excess profits or, even better, a lump sum tax on the firm would have superior welfare properties, such levies may, for reasons of internal state politics, be infeasible. Interjurisdictional competition will, however, prevent such a transfer of rents. A community that attempts to impose high levels of protection will find that firms will locate elsewhere if not given a corresponding benefit in some other form, for example, lower wages or taxes.[23]

Waste disposal and recycling policies illustrate how local problems can become national issues because of interjurisdictional interactions. As long as waste does not seep into ground water or get converted to air pollution through incineration, waste disposal is a local problem.[24] The basic market failure is the ease with which peo-

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Environmental Regulation on Business Location in the United States, 19 Growth & Change 22 (1988); Christopher J. Duerksen, *Environmental Regulation of Industrial Plant Siting: How to Make It Work Better* 56-71 (Conservation Found., 1983); Virginia D. McConnell and Robert M. Schwab, *The Impact of Environmental Regulation on Industry Location Decisions: The Motor Vehicle Industry*, 66 Land Econ. 67 (1990).

21. See generally Revesz, 67 N.Y.U. L. Rev. (cited in note 15). Daniel Farber argues that in general "the market exacts its own inexorable penalties for needlessly burdensome regulations." Daniel A. Farber, *State Regulation and the Dormant Commerce Clause*, 3 Const. Comm. 395, 413 (1986).

22. The most sophisticated is found in Oates and Schwab, 35 J. Pub. Econ. at 335-42 (cited in note 14). The authors present a model in which communities tax or subsidize mobile capital and set local environmental quality standards. The analysis demonstratos that, under competitive market conditions, local choices will be socially optimal if jurisdictions are homogeneous in workers and use majority rule to make political choices. They also present more complex models in which this result does not hold.

23. See generally James R. Markusen, Edward R. Morey, and Nancy D. Olewiler, *Competition in Regional Environmental Policies When Plant Locations Are Endogenous*, 41 J. Pub. Econ. (forthcoming 1994). Their model can produce levels of pollution that are either too high or too low depending on whether the disutility of pollution is relatively low or high. See generally James R. Markusen, Edward R. Morey, and Nancy D. Olewiler, *Environmental Policy When Market Structure and Plant Locations are Endogenous*, 24 J. Envir. Econ. & Mgmt. 69 (1993) (showing that small policy changes can lead to larger interjurisdictional shifts in firm locations and pollution levels).

24. Waste disposal becomes a regional problem when it contaminates regional air or water basins. The most principled response here would be to regulate the production of air and water

ple can dispose of waste unlawfully without being caught. In most jurisdictions the state has responded to the difficulty of catching litterers, not by beefing up the police force, but by providing free trash and garbage pickup, at least for households. The externalities of unregulated trash disposal are curbed, but without forcing consumers (and by extension, retailers and manufacturers) to recognize the cost of disposal or recycling.

Charging households and firms based on the volume and type of waste they produce creates an incentive for illegal dumping. If a community adopts a strict, well-enforced law against illegal dumping, trash haulers may simply cross jurisdictional borders. A local problem has become an interjurisdictional one as a result of a town's policy choice.[25] Thus, a fee system may need to be national (or international) in scope to be effective, and it must include a comprehensive attack on illegal dumping. If dumping fees are not politically possible, there may be no realistic alternative to free, publicly provided trash pickup.

Recycling requirements and policies that force producers, retailers, and customers to internalize the cost of waste disposal can supplement trash pickup. Although the costs are borne locally and vary among communities, efficiency could be served by uniform national packaging standards or deposit and return requirements. Thus, the central government would set packaging standards or levy taxes based on each product's waste content and ease of disposal. Local communities could provide supplemental programs as long as they did not generate illegal interjurisdictional hauling. In areas with high population density, it is often inefficient to dispose of waste close to its point of origin. Thus, trash exporting would be permitted so long as the importing municipality approved it.

IV. MIXED CASES

Many situations do not fit neatly into a single category. The most salient mixed cases involve nature conservation, nuclear power, and abandoned hazardous waste sites.

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pollution nationally and let local communities decide for themselves how to administer their waste collection systems subject to the caveats discussed in text.

25. See Charles E. Davis and James P. Lester, *Federalism and Environmental Policy*, in James P. Lestor, ed., *Environmental Politics and Policy: Theories and Evidence* 57, 59 (Duke U., 1989) (arguing that a uniform national policy may be the most efficient means of attacking large-scale problems, and giving the example of illicit cross-border waste shipments resulting from interstate regulatory differences).

Nature conservation implicates broad environmental concerns when it requires the preservation of the habitat of an endangered species or land that aids in flood control, water supply, or the absorption of pollutants. In these cases the decision should not be made by local planning bodies since they are unlikely to weigh global concerns adequately. Small communities, however, should be able to voice their concerns and present evidence of localized costs and benefits to higher levels of government. Yet, moving policy making to high-level governments risks possible "scapegoating"—making local communities bear the cost of a global policy. We need innovative techniques to compensate hard-hit localities if conservation decisions are to be made on ecological grounds.

The regulation of nuclear power is too complex an issue to be dealt with adequately here. Neighbors of nuclear power plants would be harmed most seriously by an accident, but they also benefit from jobs at the plants. A major accident would have an impact far beyond jurisdictional borders, but the benefits of inexpensive power are also broad-based. Some citizens object to nuclear power on principle, without concern for whether possible accidents will affect them personally. At a technical level, there are only so many ways of building a safe nuclear power plant. Centrally articulated standards can save time and money, though fine tuning may be necessary to accommodate local conditions. If plants are built, neighbors should be indemnified for the excess risks that they must bear.

Abandoned hazardous waste sites pose special problems. Here, the principal argument for federal responsibility is based on distributive justice, not efficiency. The only efficiency claim is technocratic: The central government can bring together experts to set overall standards for waste site cleanups more cheaply than the multitude of local units. Distributive justice involves considerations of intergenerational equity. Old sites represent costs imposed on current residents by past economic activities. Although the problems of hazardous waste are usually locally based, it is unfair for nearby residents to bear the costs of cleanup. After all, locals often did not know of the risk, and in most cases the hazardous material came from outside the neighborhood. Why should existing residents and businesses be required to pay for cleanup to make the health prospects of residents equal to those of others who had the good luck to be located in clean areas?[26] Furthermore, if a local government attempts to finance

26. This issue does not arise for old sites that those purchasing land in the region knew to he hazardous. In such situations, the danger would be incorporated in the sales price. As long

cleanups by raising taxes, it discourages prospective businesses and residents from locating there.

V. CONSTITUTIONAL STRUCTURE

The division of regulatory authority in Germany and the United States does not mirror accurately the political-economic concerns raised above. The laws of both nations acknowledge the interjurisdictional nature of many pollution problems, but the actual division of authority contains many questionable features. Some of these issues have implications for German and American constitutional law.

A. The United States Constitution

The United States Constitution contains no detailed assignment of responsibilities to levels of government. The Tenth Amendment consists of a single sentence: "The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people."[27] This sentence has not produced a jurisprudence of regulatory federalism. The Supreme Court is permissive. It has invoked the Interstate Commerce Clause[28] to justify a wide range of federal regulation even in cases where the interstate impact is indirect.[29] Federal regulation of the environment seldom has raised constitutional issues.[30] Comprehensive federal statutes control air

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as new owners are informed of their responsibility prior to the purchase, there is no unfairness in requiring them to follow through. The problem is then pushed back a step to the seller who boro the cost in the form of a reduced price.

27. U.S. Const., Amend. X.

28. U.S. Const., Art. I, § 8.

29. Laurence H. Tribe, *American Constitutional Law* §§ 5-4 to 5-6 (Foundation, 2d ed. 1988). *Hodel v. Indiana*, 452 U.S. 314 (1981), states that the Supreme Court will invalidate legislation enacted under the Commerce Clause "only if it is clear that there is no rational basis for a congressional finding that the regulated activity affects interstate commerce, or that there is no reasonable counection between the regulatory means selected and the asserted ends." Id. at 323-24 (citations omitted). A federal appeals court recently suggested limits to the Court's permissive jurisprudence at least in the criminal justice area. The Fifth Circuit held unconstitutional a federal law outlawing guns in the vicinity of schools. See *United States v. Lopez*, 2 F.3d 1342 (5th Cir. 1993), cert. granted, 114 S. Ct. 1536 (April 18, 1994). The court based its decision on Congress's failure te mention any link to interstate commerce. Id. at 1354-55. But see the contrary holding in *United States v. Ornelas*, 841 F. Supp. 1087 (D. Colo. 1994). The judge in *Ornelas* believed that precedent required him to uphold the law, but stated in a footnote that if he could, he would hold the law unconstitutional as a violation of the Tenth Amendment. Id. at 1093 n.11.

30. A recent attempt to challenge the constitutionality of the regulation of intrastate wetlands under the Clean Water Act failed. A panel of the Seventh Circuit held that the federal

and water pollution; laws on waste, pesticides, drinking water, and the protection of land and endangered species give the federal government an important role in addressing these problems.[31]

The link between federalism and the environment recently has been raised in three areas of constitutional law: (1) Commerce Clause challenges to state laws that discriminate against out-of-state producers or favor in-state business; (2) disputes over the scope of state common law remedies in the face of preemptive federal statutes in the same field; and (3) a Tenth Amendment challenge to a statute requiring states to take certain actions.

First, federal courts have invoked the Commerce Clause to strike down state laws that impose special burdens on the disposal of out-of-state waste or that favor in-state producers of polluting products. Building on an earlier case dealing with solid waste, the Supreme Court outlawed state taxes or fees that require out-of-state waste generators to pay higher rates.[32] Differential charges must be linked to differences in costs of handling such waste. The Court also held state regulations unconstitutional that required landfills to accept only locally generated waste,[33] and that required all local waste to be handled by local facilities.[34] Waste is to be treated as any other article of commerce.

Providing special benefits to in-state firms is also suspect under the Commerce Clause. For example, a federal district court struck down an Illinois law that favored local high-sulfur coal as an

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regulation of isolated, intrastate wetlands was both contrary to the Clean Water Act and unconstitutional under the Commerce Clause. *Hoffman Homes v. EPA*, 961 F.2d 1310 (7th Cir. 1992). Even this panel, however, was careful to point out that it agreed with those courts that have upheld the constitutionality of federal regulation of environmental hazards with interstate impacts. Id. at 1317. Subsequent to this decision, the EPA requested a rehearing, the original order was vacated, and a majority of the same panel wrote a narrow opinion holding that the jurisdiction of the Clean Water Act did not extend to the particular property at issue. *Hoffman Homes v. EPA*, 999 F.2d 256 (7th Cir. 1993). The author of the original opinion wrote a concurrence in which he continued to maintain that federal regulation of intrastate wetlands was unconstitutional. Id. at 262-63 (Manion, C.J., concurring).

31. For a summary of federal environmental statutes and their implementation, see generally Burtraw and Portney, *Environmental Policy* (cited in note 9) and the articles collected in Paul R. Portney, ed., *Public Policies for Environmental Protection* (Resources for the Future, 1990).

32. *Oregon Waste Sys. v. Department of Envir. Quality*, 114 S. Ct. 1345 (1994); *Chemical Waste Management, Inc. v. Hunt*, 112 S. Ct. 2009 (1992). The decisions build on *City of Philadelphia v. New Jersey*, 437 U.S. 617 (1978), a case that struck down a New Jersey law prohibiting the import of out-of-state solid waste. See also *New Energy Co. of Indiana v. Limbach*, 486 U.S. 269 (1988) (holding a lower tax on Ohio-produced ethanol unconstitutional).

33. See *Fort Gratiot Sanitary Landfill, Inc. v. Michigan Dep't of Natural Resources*, 112 S. Ct. 2019 (1992).

34. *C & A Carbone, Inc. v. Clarkstown*, 114 S. Ct. 1677 (1994).

interference with interstate commerce.[35] The act was passed after the federal Clean Air Act was amended in 1990 to remove the favorable treatment of high-sulfur coal. The Constitution permits the federal government to favor regional interests as it did under the Clean Air Act Amendments of 1977.[36] The federal district court held, however, that states could not take protectionist actions on their own.[37] Nevertheless, direct subsidies to a state's industry appear to be permissible, and if the state becomes a "market participant" by opening its own landfill or disposal facility, it can do as it likes.[38]

Second, the status of state common law nuisance suits has been questioned in cases challenging the preemptive power of the federal Clean Water Act. A series of cases involving suits by the state of Illinois against the city of Milwaukee concluded that the Clean Water Act preempted federal and state common law actions between parties in different states.[39] A subsequent case found that suits brought under the law of the discharger's state are permitted,[40] but that these suits need not be brought in the courts of the discharger's state. Thus, a New York discharger could be sued in Vermont courts for common law nuisance under New York law.[41]

The decisions in these first two categories limit the states' ability to isolate themselves from the rest of the nation and establish the preemptive effect of federal statutes. No case, however, explicitly

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35. *Alliance for Clean Coal v. Craig*, 840 F. Supp. 554 (N.D. Ill. 1993). The Illinois Coal Act required public utilities to take into account "the need to use coal mined in Illinois" and "the need to preserve as a valuable state resource the mining of coal in Illinois," when they formulated their Clear Air Act compliance plans. Id. at 557. The Act also required the four largest utilities to install devices to control sulfur dioxide emissions ("scrubbers"), a requirement that would decrease the benefits of using low-sulfur, out-of-stato coal. Id. The district court found that the statutory language represented "pure protectionism." Id. at 559.

36. See generally Bruce A. Ackerman and William T. Hassler, *Clean Coal/Dirty Air* (Yale U., 1981) (describing the legislative dealmaking that produced a statute favoring states that produce high sulfur coal).

37. *Alliance for Clean Coal*, 840 F. Supp. at 561.

38. See *Chemical Waste Management*, 112 S. Ct. at 2019 (Rehnquist, C.J., dissenting). The market-participant doctrine is stated in *Hughes v. Alexandria Scrap Corp.*, 426 U.S. 794, 809-10 (1976).

39. *Illinois v. City of Milwaukee* I, 406 U.S. 91 (1972); *Illinois v. City of Milwaukee* II, 451 U.S. 304 (1981); *Illinois v. City of Milwaukee* III, 731 F.2d 403 (7th Cir. 1984).

40. *International Paper Co. v. Ouellette*, 479 U.S. 481 (1987).

41. Id. In *Ouellette*, property owners who resided or leased land on the Vermont shore of Lake Champlain filed a class action suit seeking damages in a Vermont state court against International Paper Company, the operator of a pulp and paper mill on the New York side of the lake. Id. at 483. The Court held that application of Vermont's common law of nuisance to a point source in New York was preempted by the Clean Water Act because this would constitute a severe interference with the Act's scheme. Id. at 497. However, the Court also noted that the savings clause of the Act preserved other state actions, and allowed aggrieved parties to bring a nuisance claim under the law of the source state, in this case New York. Id. at 499-500.

considers the substantive division of tasks between federal and state governments or challenges the federal government's ability to regulate the environment. Commerce Clause jurisprudence has not addressed interregional differences in the substance of environmental problems, differences that may require interstate cooperation rather than federal uniformity.

The third category does touch on the subject of interstate cooperation and its link to federal power. A recent case invokes the Tenth Amendment to limit federal power.[42] A federal statute required states to form regional interstate compacts to handle the disposal of low-level nuclear waste or to dispose of it within their own borders.[43] State officials engineered passage of the law. The original act imposed no sanctions on those that failed to comply. After several years of experience with this act, the states themselves proposed that Congress pass a tougher measure containing federally enforceable incentives and penalties. The Supreme Court upheld the sanctions supported by the states.[44] However, the Court found a provision that ordered uncooperative states to take title to internally generated waste unconstitutional on federalism grounds.[45] The "take title" provision, the Court reasoned, "crossed the line distinguishing encouragement from coercion."[46]

In his dissent, Justice White objected to the decision on the ground that "the . . . Act was very much the product of cooperative federalism, in which the States bargained among themselves to achieve compromises for Congress to sanction."[47] Justice White's dissent would have been entirely reasonable, if true. If the states asked to be bound by a federal statute *ex ante*, they should not be able to renege *ex post*. A study of the Act's legislative history suggests that Justice White's claim, though true for the other two sanctions upheld by the Court, did not apply to the "take title" provision. According to one study, the provision was added on the floor of the Senate on the

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42. *New York v. United States*, 112 S. Ct. 2408 (1992).

43. Low-Lovel Radioactive Waste Policy Amendment Act of 1985, Pub. L. No. 99-240, 99 Stat. 1842 (1986) (codified at 42 U.S.C. § 2021b-2021j (1988)). The Act was originally passed in 1980. In drafting both the original act and the 1985 revision, Congress relied heavily on reports submitted by the National Governors' Association. See *New York*, 112 S. Ct. at 2415; id. at 2435-39 (White, J., concurring in part and dissenting in part).

44. *New York*, 112 S. Ct. at 2427.

45. Id. at 2429.

46. Id. at 2427.

47. Id. at 2438. Justice White argued that the state of New York "should be estopped from asserting the unconstitutionality of a provision that seeks merely te ensure that, after deriving substantial advantages from the 1985 Act, New York in fact must live up to its bargain." Id. at 2440 (White, J., concurring in part and dissenting in part).

last day of the 99th Congress.[48] It had been proposed by the Federal Nuclear Regulatory Commission in hearings, but had not been formally approved by either the House or the Senate committees and was not part of the states' proposal.[49] Although the Court stated that the consent of state officials is not sufficient to lend constitutional legitimacy to a federal law,[50] the provision in question did not, in fact, provide a sharp test of this claim.

The Supreme Court has not worked out clearly the limits of federal and state power over environmental issues. Federal courts seem to give state common law greater deference than state statutes, perhaps because state statutes more explicitly favor in-state interests.[51] States cannot favor in-state over out-of-state coal producers or waste generators, but states can provide direct subsidies, and federal statutes can have disparate state or regional impacts. Although coercive federal restrictions on the states are unconstitutional, the Court has not clearly articulated the distinction between coercive conditions and those that merely provide incentives.

B. The German Grundgesetz

In contrast to the American Constitution, the German *Grundgesetz* (Constitution) creates explicit categories of federal and state control. The allocation of responsibilities and funding between federal and state governments varies depending on the object of regulation. The *Grundgesetz* distinguishes between nuclear power, real estate and housing law, waste disposal, air purification, and noise abatement, on the one hand,[52] and land distribution, regional planning, water, hunting, nature conservation, and landscape management, on the other.[53] In the first group, concurrent legislative authority exists. The German states, or *Länder*, can legislate when the federal government has not. The federal government can legislate

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48. A. Marice Ashe, *The Low-Level Radioactive Waste Policy Act and the Tenth Amendment: A "Paragon of Legislative Success" or a Failure of Accountability?*, 20 Ecol. L. Q. 267, 284-85 (1993).

49. Id.

50. *New York*, 112 S. Ct. at 2432. The Court's argument for this position is that the constitutional division of authority between federal and state governments is for the protection of individuals, not for the benefit of the states. Id.

51. While no current study supports this proposition, the Author's research into this area indicates that federal courts provide more deference to state decisional law than to state statutory law.

52. *Grundgesetz* ("GG"), Arts. 74(11a), (18), (24) (F.R.G.).

53. GG, Arts. 75(3)-(4).

when states might be tempted to impose costs on each other,[54] exactly the argument made above for permitting preemptive federal statutes. For the second group, the *Grundgesetz* permits federal framework laws that give discretion to the *Länder* to fill in the legislative details with their own statutes.[55]

This constitutional distinction contains anomalies not justified on the basis of the nature of the substantive environmental problems. Water quality should fall into the first concurrent category. Noise control should be in the second framework group unless interjurisdictional competition is thought to be a serious problem. Similarly, nature conservation should distinguish between locally beneficial projects and those that support the preservation of species and biodiversity. Waste disposal is also a mixed case because it can have local, regional, and national impact. The economic analysis of federalism outlined above has had little impact on the constitutional structure. The Bundestag (the German parliament) and the Constitutional Court could use the general language of the *Grundgesetz*[56] to make these distinctions, but so far these bodies have not done so.

In fact, so far as the question has been raised at all in the environmental area, the judicial response has been disappointing. The German constitution explicitly requires the federal government to administer the federal waterways used for inland shipping.[57] The Constitutional Court held that federal jurisdiction extended only to commerce between the German *Länder*, not to the control of water pollution and water supply.[58] Yet, the justification for a federal presence is the same in both situations because they both involve the costs one *Land* may impose on another and on the nation as a whole. Water pollution control is subsumed under the federal authority to promulgate framework statutes concerning the "water regime." Such framework laws constitute the weakest form of federal legislative

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54. Under GG, Art. 72(2), the federal government has the right to legislate when:
(1) a matter cannot be effectively regulated by the legislation of individual Länder, or (2) the regulation of a matter by a Land statute might prejudice the interests of other Länder or of the whole body politic, or (3) the maintonance of legal or economic unity, especially the maintenance of uniformity of living conditions beyond the territory of any one Land, necessitates such regulation.

55. For more on the constitutional provisions, see generally David P. Currie, *The Constitution of the Federal Republic of Germany* 33-101 (forthcoming U. of Chicago, 1994).

56. GG, Art. 72.

57. GG, Art. 89.

58. Judgment of Oct. 30, 1962, 15 Entscheidungen des Bundesverfassungsgerichts ("BVerfGE") 1 (F.R.G.); Judgment of Apr. 11, 1967, 21 BVerfGE 312.

authority.[59] Weak federal authority exists despite the fact that Germany has a number of long, heavily industrialized rivers that flow through several *Länder* and foreign countries.

In practice, however, the anomalies are not as serious as the constitutional text might imply. On the one hand, the waste disposal law is more like a framework law than a detailed program of control.[60] On the other hand, the federal water law is quite stringent and detailed, and a separate federal statute levies taxes on dischargers.[61] Although the constitutional authority is weak, the federal government does oversee cooperative planning,[62] and century-old associations of water users control both the water quality and use of a number of rivers.[63] Furthermore, international bodies deal with German water quality issues. For example, there is a Convention for the Protection of the Rhine, (the *Rheinschutzübereinkommen*), and in 1990 Germany and Czechoslovakia established an International Commission for the Protection of the Elbe.[64]

The *Grundgesetz* makes the states responsible for the day-to-day implementation of most federal regulatory statutes. Although the

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59. Constitutional amendments to give the federal government preemptive power over the Länder in the area of water pollution failed to pass in 1973, 1974, and 1975. Gardner M. Brown, Jr. and Ralph W. Johnson, *Pollution Control by Effluent Charges: It Works in the Federal Republic of Germany, Why Not in the U.S.*, 24 Nat. Resources J. 929, 930 (1984).

60. Abfallgesetz ("AbfG") of Aug. 27, 1986 (as amended Sept. 23, 1990).

61. Wasserhaushaltsgesetz ("WHG") of Sept. 23, 1986 (as amended Feb. 12, 1990 and Aug. 26, 1992); Abwasserabgabengesetz ("AbwAG") of Nov. 6, 1990.

62. WHG § 36-36b requires that each *Land* draw up both an overall plan and specific plans for each body of water. Interstate agreements on the use and condition of water are a reason for requiring a plan, WHG § 36b(2).2, and the federal government can use administrative guidelines te influence the content of plans, WHG §§ 36(3) & 36b(7). See Horst Neumann, Hans-Joachim Schultz-Wildelau, and Jan Schilling, *Wasserwirtschaftliche Rahmenpläne und Bewirtschaftungspläne (§§ 36, 36b Wasserhaushaltsgesetz) als Beitrag zum Umweltschutz in Niedersachsen*, in Werner Schenkel and Peter-Christoph Storm, eds., *Umwelt: Politik, Technik, Recht* 257, 259 (Erich Schmidt, 1990) (listing the 30 general planning areas in the western part of Germany).

63. The first such body, the Emscher Genossenschaft, was established in 1902 in response to a discharge of dye into the Rhine. It was followed by the establishment of similar bodies on the Wupper, Lippe, and Ruhr. The associations include riparian businesses and communities and the water industry. Albert Weale, *Vorsprung durch Technik? The Politics of German Environmental Regulation*, in Kenneth Dyson, ed., *The Politics of German Regulation* 159, 162 (Dartmouth U., 1992).

64. Umweltbundesamt, *Jahresbericht 1990* at 254 (Umweltbundesamt, 1991). With the breakup of Czechoslovakia, the Czech Republic and Slovakia are now Germany's partners along with the European Union. 1990 Convention on the International Commission for the Protection of the Elbe, Int'l Envir. Rep. (BNA) reference file 35:0451 (Oct. 8, 1990). There are also specific conventions for the Rhine which include the European Union as a signatory. Convention on the Protection of the Rhine Against Chemical Pollution, 16 I.L.M. 242 (Dec. 3, 1976); Convention on the Protection of the Rhine Against Pollution by Chlorides, 16 I.L.M. 265 (Dec. 3, 1976). The Elbe is much more polluted than the Rhine. For a comparison of the two rivers in 1990, see Umwelt 407 (Oct. 1993).

federal government can exercise some control over the *Länder*, there is no possibility of direct federal administration in the environmental area.[65] This institutional structure gives the *Länder* considerable freedom to shape federal requirements to fit their priorities. In the United States the states also are heavily involved in the administration of federal environmental laws. Nevertheless, states may choose not to become involved, and, conversely, the federal government can judge a state to be incapable of effective administration and can federalize administration of the program in that state. Some view this freedom to refuse involvement as a cornerstone of American federalism that enhances state power. The German situation casts doubt on this claim. The German *Länder* are powerful precisely *because* the federal government has no choice except to implement its statutes through the states.

The German federal government faces constitutional limits on its authority to make grants to the states. The *Grundgesetz* establishes overall conditions for allocating revenue that take account of interstate differences in fiscal resources.[66] The Constitutional Court ruled in the mid-1970s that imposing conditions on federal grants would violate the freedom of federation members.[67] More recently, the Constitutional Court held that a federal law apportioning revenues from corporate and wage taxes had not adequately considered variations in the tax bases of state governments.[68] These tax receipts, which constitute an important revenue source for state governments, become part of each state's general fund. In a reunited Germany, the old formulas inadequately reflect the diverse situations of the *Länder*. As interpreted by the Constitutional Court in the cases cited above,

65. GG, Arts. 83-85. Article 83 states that "the Länder shall execute federal statutes as matters of their own concern insofar as this Basic Law does not otherwise provide or permit." Article 87 lists matters for direct federal administration. The environment is not on the list, although Article 87(3) provides for the creation of federal authorities "in case of urgent need" with the consent of the legislative bodies.

66. GG, Arts. 104a, 106, 107.

67. Judgment of Mar. 14, 1975, 39 BVerfGE 96; Judgment of Feb. 10, 1976, 41 BVerfGE 291. See also Philip Blair, *Federalism, Legalism and Political Reality: The Record of the Federal Constitutional Court*, in Charlie Jeffery and Peter Savigear, eds., *German Federalism Today* 63, 78-79 (St. Martin's, 1991); Currie, *The Constitution of the Federal Republic of Germany* at 83-84 & nn.126-32 (cited in note 55).

68. Judgment of June 24, 1986, 72 BVerfGE 330; Blair, *Political Reality* in Jeffery and Sarigear, eds., *German Federalism Today* at 79-81; Currie, *The Constitution of the Federal Republic of Germany* at 84-86 & nn.133-42; Donald P. Kommers, *The Constitutional Jurisprudence of the Federal Republic of Germany* 100 (Duke U., 1989). See generally Wolfgang Renzsch, *Föderale Finanzbeziehungen im Parteienstaat. Eine Fallstudie zum Verlust politischer Handlungsmöglichkeiten*, 3 Zeitschrift für Parlamentsfragen 331 (1989) (describing the political wrangling which produced the nnconstitutional allocation).

the fiscal constitution, which is based on revenue-sharing principles, limits the scope of federal grants earmarked for specific purposes, such as the cleanup of old dumps.[69]

The current debate over the German constitution has done little to advance the discussion of German federalism. While some argue that environmental protection should be included in the *Grundgesetz* as a goal of the German state, many combine this position with support for further delegation of authority to state and local governments.[70] There appears to be little recognition of the tension between the solution of large-scale environmental problems and the parochial concerns of small-scale governments. That tension is currently blurred because of the presence of the Green Party in two *Land* coalition governments and eleven of sixteen state parliaments at a time when the party is weak nationally.[71] Environmentalists who support greater decentralization may be extrapolating too easily from the current situation in which the *Länder* appear, on balance, greener than the federal government. These advocates are looking at political configurations without considering the underlying nature of the substantive problems. In an interdependent Europe additional delegation of environmental responsibilities to the *Länder* seems ill-advised.

VI. LOCAL CONTROLS OVER REGIONAL PROBLEMS

The environmental policies of Germany and the United States often ignore the regional character of pollution. The scope of the problem and the jurisdictional level at which solutions are developed are mismatched. Pollution with regional and national impact is frequently regulated by state and local officials, who have no incentive

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69. Nevertheless, by the end of 1992 the federal government had spent DM 1.6 billion (about $1 billion) for 1,800 special environmental protection projects in the east. According to the Environmental Ministry, the environmental situation is improving in the east both because of the shutdown of old heavily polluting factories and because of new investment. *Umweltsituation in den neuen Ländern spürbar verbessert*, Umwelt 474-75 (Dec. 1993).

In addition to direct subsidies, the federal government provides tax benefits and borrowing subsidies throughout the country to encourago energy efficiency and environmental protection. See Michael Klöpfer, *Umweltrecht* 167-75 (C.H. Beck, 1989). See gonerally Helmut Weidner, *Air Pollution Control Strategies and Policies in the Federal Republic of Germany* (Wissenschaftszentrum Berlin für Sozialforschung, 1986).

70. Friedrich Adolf Jahn MdB, CDU/CSU, *Keine Totalrevision des Grundgesetzes*; Detlef Kleinert MdB, FDP, *Als verläßiche Grundlage anerkennen*; Hans-Jochen Vogol MdB, SPD, *Vom Grundgesetz der alten Bundesrepublik zur Verfassung der neuen Bundesrepublik*, Das Parlament 13 (Apr. 10, 1992).

71. The states of Bremen and Hesse have Greens in their governing coalitions. Federal Republic of Germany, *Demokratie im Schaubild* 29 (Transcontact, 1994).

to look outside their own jurisdiction. Even when a national statute guides lower-level enforcement, implementation by state and local officials may ignore the policy's broader impact. Conversely, federal statutes can be overly rigid and insensitive to differing state and local conditions. Both countries experience both problems, but over-delegation is especially prevalent in Germany, and excessive rigidity is widespread in the United States.

In Germany, relatively weak federal control of implementation makes the problem of cross-border effects especially serious. *Land* officials have considerable discretion in setting enforcement priorities.[72] Even when a strong federal role is justified, implementation is largely left to the states and localities. The possibilities for exceptions favoring local business are great even when environmental harms cross jurisdictional borders.

Local control is especially notable in implementing air pollution policy in which the federal law is vague and state governments have failed to promulgate clear enforcement guidelines.[73] According to one study, this situation led to numerous cases of special treatment and exceptions in the 1970s when state governments implemented the law.[74] While central government guidelines and regulations strengthened air pollution requirements in the 1980s, case-by-case licensing processes remain open to local influence. Water pollution policy is better organized at the state level, but the value of subsidies for water pollution control does not necessarily reflect the costs of pollution.[75]

The German emphasis on licensing in both water and air pollution control combines with federalism to encourage a case-by-case approach. While ambient conditions are supposed to play a role in the licensing process, state and local officials lack strong incentives to look outside their own borders. The federal government has issued

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72. Uwe Leonardy, *The Working Relationships Between* Bund *and* Länder *in the Federal Republic of Germany*, in Jeffery and Savigear, eds., *German Federalism Today* 40, 53-54 (cited in note 67); Gary Davis and Joanne Linnerooth, *Government Ownership of Risk: Guaranteeing a Treatment Infrastructure*, in Bruce W. Piasecki and Gary A. Davis, eds., *America's Future in Toxic Waste Management: Lessons from Europe* 95, 97-99 (Quorum, 1987).

73. BundesImmissionsschutzgesetz ("BImSchG") of May 14, 1990.

74. Renate Mayntz, *Intergovernmental Implementation of Environmental Policy*, in Kenneth Hanf and Fritz W. Scharpf, eds., *Interorganizational Policymaking: Limits to Coordination and Central Control* 201, 204-05 (Sage Publications, 1978).

75. Mayntz, *Intergovernmental Implementation* in Hanf and Scharpf, eds., *Interorganizational Policymaking* at 205. For example, Baden-Württemberg's efforts to clean up Lake Constance involved subsidies for sewage treatment that favored the construction of small inefficient plants. Fritz W. Scharpf, Berud Reissert, and Fritz Schnabel, *Policy Effectiveness and Conflict Avoidance in Intergovernmental Policy Formation*, in Hanf and Scharpf, eds., *Interorganizational Policymaking* 57, 78-83.

technical guidelines that have presumptive force covering air pollution, noise, and solid waste.[76] This practice can counteract local incentives to be overly lenient or excessively strict, but it does not result in cost-efficient policies. The guidelines may lead state and local officials to be tough, but that is quite different from considering the systemic impact of decisions on national and international environmental quality.

In the past German observers have argued that an "implementation deficit" exists in environmental law.[77] This deficit may have resulted from the attempts of individual *Länder* to benefit economically at the expense of others. At present that criticism is blunted by the existence of the Green Party as a coalition partner in some state and local governments. Some observers now claim that enforcement is too vigorous in some *Länder*.[78] Whatever the bias, it is in any case inconsistent.

Federal control is stronger in the United States, and regional offices of the Environmental Protection Agency play a central role.[79] Nevertheless, state implementation creates problems of inconsistent

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76. For a discussion of their promulgation, see Rose-Ackerman, *Controlling Environmental Policy* ch. 4 (cited in note *). See also Fritz Ossenbühl, *Autonome Rechtsetzung der Verwaltung*, in J. Isensee and P. Kirchhof, eds., 3 *Handbuch des Staatsrechts der Bundesrepublik* 425, 429-30, 457-59 (C.F. Müller, 1988).

77. See Eckard Rehbinder, *Controlling the Environmental Enforcement Deficit: West Germany*, 24 Am. J. Comp. L. 373, 373-75 (1976). Not surprisingly, the Länder officially rejected the notion of a deficit in enforcement. According to Rehbinder, however, "many Land officials, in particular those on the lower administrative levels, privately admit the existence of the enforcement deficit." Id. at 374. Ronald Brickman, Sheila Jasanoff, and Thomas Ilgen claim that the Länder vary widely in the resources they commit te the enforcement of the chemical control law. Ronald Brickman, Sheila Jasanoff, and Thomas Ilgen, *Controlling Chemicals: The Politics of Regulation in Europe and the United States* 49-50 (Cornell U., 1985). Sonja Boehmer-Christiansen and Jim Skea claim that similar variability exists in the state licensing of industrial plants under federal air pollution laws. Sonja Boehmer-Christiansen and Jim Skea, *Acid Politics: Environmental and Energy Policies in Britain and Germany* 178 (Bellhaven, 1991). Gertrude Lübbe-Wolff claims that although building projects are seldom begun without the requisite permits under the law controlling noise and pollution, water permits are not always issued when required by law and, if issued, are not well enforced. Gertrude Lübbe-Wolff, *Das Kooperationsprinzip im Umweltrecht—Rechtsgrundsatz oder Deckmantal des Vollzugsdefizits?*, in Arthur Benz and Wolfgang Seibel, eds., *Zwischen Cooperation und Korruption: Abweichendes Verhalten in der Verwaltung* 209, 223 (Nomos, 1992).

78. The existence of this public perception is reported in letters to the Author from Prof. Dr. Philip Kunig, Faculty of Law, Free University of Berlin (June 4, 1993) and Prof. Dr. Fritz W. Scharpf, Max Plank Institute for Social Research, Cologne, Germany (June 1, 1993) (both on file with the Author).

79. For a comparison of Germany and the United States in the field of air pollution see generally Eberhard Bohne, *Politics and Markets in Environmental Protection: Reforming Air Pollution Regulation in the United States of America and the Federal Republic of Germany*, Report to the German Marshall Fund of the United States (draft, Aug. 1987) (on file with the Author).

policies across the country and risks underregulation of pollution.[80] For example, the focus on state implementation plans under the American Clean Air Act invites state officials to take a parochial view. While the 1990 amendments put more emphasis on the control of pollutants that cross state boundaries, it remains to be seen if the new provisions are sufficient. A pre-1990 study of the administration of the Clean Air Act found that lower-level governments and federal district courts flexibly administered stringent federal regulations.[81] The centralized nature of federal policy making produced strains lower down the government ladder in which disproportionate costs were sometimes imposed on individual dischargers. These problems were resolved ad hoc, often to avoid the shutdown of an important employer.

In the past, the Clean Water Act provided federal matching funds to state and local governments for water pollution projects.[82] Such matching grants could have been designed to induce local governments to account for the costs that their sewage imposes on downstream communities. The federal government could have provided a larger subsidy to those communities that imposed more costs out of state. In practice, matching rates never bore any relation to the degree to which costs were externalized.[83] Studies of the location and effectiveness of sewage treatment plants suggest that efficient improvements in water quality seldom determined where and when subsidized plants were built. The days of large-scale grants for sewage treatment plant construction are over, but current policy has not corrected these deficiencies.[84]

In Germany, too much decentralization has led the federal government to try to induce lower-level licensing authorities to impose high standards. Unable to enforce strong regional plans effectively, especially for air pollution, federal authorities must rely on technical standards to guide these licensing activities. Even the sub-

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80. For a general discussion of the impact of American federalism on air and water pollution policy, see William R. Lowry, *The Dimensions of Federalism: State Governments and Pollution Control Policies* (Duke U., 1992).

81. R.S. Melnick, *Regulation and the Courts: The Case of the Clean Air Act* 193-238 (Brookings Inst., 1983).

82. 33 U.S.C. §§ 1251-1376 (1976 & Supp. IV 1980).

83. Id.

84. The matching grant program is being replaced with a revolving loan program. A. Myrick Freeman III, *Water Pollution Policy*, in Paul R. Portney, ed., *Public Policies for Environmental Protection* 97, 134-40 (Resources for the Future, 1990). See *Grant-to-Loan Transitions in Water Act Heralde New State, EPA Roles, Quigley Says*, 17 Envir. Rep. (BNA) 1780 (Feb. 20, 1987) (noting 20% state or local matching for construction loans for municipal sewage treatment works).

sidies provided by federal revenue sharing and tax benefits are subject to the implementation priorities of lower-level governments.[85] In contrast, too much centralization in the United States has produced stringent, legally binding regulations for new air pollution sources and industries that pollute the water.[86] These uniform rules often are poorly adapted to individual air basins and watersheds, and the exceptions to them, permitted by state officials and federal courts, are unlikely to reflect the differential cost-benefit tradeoffs.[87]

VII. HAZARDOUS WASTE AND RECYCLING

Even if the environmental issue is locally based, too much authority in the hands of state and local governments can generate destructive competition and serious inequities. Hazardous waste policy in Germany provides an instructive contrast to the American regulatory structure; United States policy is criticized for excessive rigidity, and the German solution is too decentralized. German recycling policy, in contrast, is too heavily controlled by the federal government.

Destructive interstate competition among the American states is a well-recognized problem. It has been discussed extensively in the context of state business taxes and investment aids; the same principles apply to environmental policy as well.[88] One of the ironies of the Reagan Administration's efforts to devolve regulatory authority to the states was the occasional opposition of state officials. For example, governors welcomed devolution of regulatory authority from the Environmental Protection Agency, but argued that "successful delegation of programs can only be accomplished with strong technical and financial assistance from EPA, a national presence of EPA in standards' setting and resolving interstate pollution problems, and strong

85. Graham Bennett and Konrad von Moltke describe the importance of subsidies and tax benefits in administering pollution policy in Hamburg. See Graham Bennett and Konrad von Moltke, *Integrated Permitting in the Netherlands and the Federal Republic of Germany*, in Nigel Haigh and Frances Irwin, eds., *Integrated Pollution Control in Europe and North America* 105, 128 (Conservation Fonnd., 1990).

86. The Clean Air Act permits interstate differences in air quality plans subject to federal guidelines, but these differences are tied te state boundaries, not air basins. 42 U.S.C. § 7410(a)(2) (1988 & Supp. IV 1992) (requiring each state to develop and submit a plan to the EPA).

87. Charles Davis and James Lester document interstate differences in dependence on federal funds and commitment te environmental protection as a policy goal. Davis and Lester, *Federalism and Environmental Policy* in Lester, ed., *Environmental Politics and Policy* at 71-83 (cited in note 25).

88. Id. at 62.

federal research."[89] These officials recognized the benefits of avoiding destructive interstate competition by using a strong, federal presence to tie their hands.

This idea is a basic principle behind the federal Superfund law mandating the cleanup of existing hazardous waste sites.[90] Superfund—financed by a special national tax on waste producers—pays for cleanup if the responsible parties cannot be found.[91] Waste sites usually affect only nearby residents, making a strong federal role seem unjustified. Nevertheless, any state that implemented a vigorous cleanup program would burden its own taxpayers and induce potentially liable firms to relocate. Thus, few states act on their own. Federal intervention is also justified on distributive justice grounds. Because of these considerations, one cannot reform the much-criticized federal law by arguing for devolution to lower levels of government. Criticism must instead focus on the design of the statute.

An alternative to the cumbersome Superfund process would be a law placing liability on waste producers, but leaving local communities the authority to decide whether to engage in cleanup or spend the proceeds in some other manner. One could retain the current Superfund, under which the federal government provides backup funding if the waste producers cannot be found or are unable to pay. In other words, the federal government would establish the basic right to compensation and let local communities decide how to balance the reduction of health risks against other funding priorities.[92] Such a

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89. National Governors' Association, Environmental Subcommittee, *Report of Work Group on Delegation and Oversight* (Dec. 1982).

90. Burtraw and Portney, *Environmental Policy* in Helm, ed., *Economic Policy Towards the Environment* at 307-08 (cited in note 5); Roger C. Dower, *Hazardous Wastes*, in Portney, ed., *Public Policies for Environmental Protection* at 151, 168-77 (cited in note 84). The formal name of the act is the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA").

91. Dower, *Hazardous Wastes* in Portney, ed., *Public Policies for Environmental Protection* at 169-70. Government seeks to collect cleanup costs and the value of damages te natural resources from those waste producers who used a particular site. Comprehensive Environmental Rosponse, Compensation and Liability Act, 42 U.S.C. § 9607(a) (1991). The program is very expensive. The cumulative authorized commitment of federal tax dollars is $15.2 billion and estimates of total costs range from $100 billion to $1.7 trillion. Thomas Church and Robert T. Nakamura, *Cleaning Up the Mess: Implementation Strategies in Superfund* 3 (Brookings Inst., 1993). The search for responsible parties and the conflicts between them over liability have slowed cleanup efforts and produced a heavy judicial caseload as "potentially responsible parities" sue each other. Id. at 7, 24-28. The executive branch, not the courts, sets standards for damage assessment. See *State of Ohio v. United States Dep't of the Interior*, 880 F.2d 432, 440 (D.C. Cir. 1989) (reviewing the regulations for damage assessment and finding fault with some aspects).

92. Under such a system one would need to determine the proper amount of compensation based on the health risks and other costs of the waste site. The major argument against such a

program would limit the federal government's role to restraining interstate competition and equalizing state and local financial capacities. Because the risks are local, addressing the problems posed by them would be a local choice.

Germany has no federal equivalent of Superfund, and its liability law makes it difficult to extract cleanup funds from those who generated waste in the past.[93] The federal law permits municipal waste treatment facilities to reject hazardous waste, but does not mandate a solution to the problems of disposal and the cleanup of old dump sites.[94] Cooperative industry-government cleanup efforts occur for sites currently in use or for those being prepared for future development.[95] The institutional structure is more complex regarding old sites. Land owners or past operators of waste disposal facilities can be held strictly liable for cleanup costs. However, those who generated the waste and new owners who lack knowledge of the site's characteristics escape liability.[96] Thus, frequently no one with the requisite funds can be held legally responsible for the cleanup. In response, some *Länder* levy taxes to generate cleanup funds. The

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locally based system is the political reality of local government decision making. Those harmed by the site may not be involved in making the choice, and if the damages are paid to local governments, those harmed may not receive compensation for their injuries.

93. The 1991 Environmental Liability Law does not extend liability to waste generators and transporters, and it has only prospective application. Ordinary tort law imposes liability only if the waste generator can be identified. Thomas W. Church and Robert T. Nakamura, *Cooperative and Adversary Regimes in Environmental Policy: Hazardous Waste Cleanup in Europe and the United States*, Rockefeller College of Public Affairs, State University of New York at Albany 25-29 (draft manuscript, June 19, 1994) (on file with the Author). Generators, however, could be liable if they are negligent in the selection of a waste transporter or waste disposal facility operator. A soil pollution act also is in the drafting stage. Letter to the Author from Prof. Dr. Eckard Rehbinder, Faculty of Law, J.W. Goethe University, Frankfurt am Main, Germany (June 7, 1993) (on file with the Author).

94. Abfallgosetz ("AbfG") of Aug. 27, 1986, §§ 9, 10, 11 (as amended Sept. 23, 1990).

95. Church and Nakamura, *Cooperative and Adversary Regimes* at 22-29 (cited in note 93). The states with the most active programs are Hesse, North Rhine-Westphalia, Rhineland-Palatinate, Baden-Württemberg, and Bavaria. Id. at 24. In the new eastern Länder, the federal government will bear much of the cost of cleanup because the states are too poor to finance it themselves and because the federal government holds the title to military facilities and formerly state-owned plants, both of which accounted for much of the hazardous waste produced in East Germany. The cleanup in the east will be costly. Prior to unification, much of western Europe shipped waste to East Germany for disposal. According to a Greenpeace report, 400,000 tons of hazardous waste per year were shipped to depositeries in East Germany along with large quantities of other kinds of waste. Andreas Bernstoff, *Müllkolonie DDR*, Natur 10 (Jan. 1990).

96. AbfG §§ 9, 10, 11(1). The statute only states that the authorities can impose regulations on existing waste management facilities and can prohibit their operation if that is the only way of avoiding "considerable impairment of the public interest." AbfG § 9. Furthermore, the public authorities can supervise abandoned waste management facilities and other old sites where waste has been generated, treated, stored, or deposited if this is necessary to protect the public interest. AbfG § 11(1). There is no mention of liability for those connected with such sites.

State of Hesse, for example, charges a fee to current generators of hazardous waste; the state uses these fees to clean up old sites.[97]

The decentralized nature of German hazardous waste policy permits states to make different judgments about the importance of tackling the problems of both old waste sites and newly generated waste. Subject to federal minimum standards, each *Land* can balance the costs and benefits in its own way. This structure appears desirable given the local nature of the benefits; however, decentralization creates inequities among the *Länder* that the more centralized American process avoids. Some observers claim that state authorities form coalitions with waste producers that overlook the interests of ordinary citizens.[98] Waste producers have bargaining power because they can threaten to leave the state or cutback on expansion plans. Although the threat of exit may be a problem in some *Länder*, it does not seem to be the major disadvantage of German policy. Inequity appears to be a more serious problem. Rich states can collect cleanup funds from individuals and generators more easily than poor ones with little industrial base and many waste sites.[99] Interregional inequities have become more acute with reunification. Before 1989, much western waste was dumped in East Germany. The new eastern *Länder* now contain this waste but have no wealthy producers to finance a cleanup.

Recognizing this problem, the federal government has sought ways around the constitutional limits on earmarked grants to the

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97. The cleanup will be managed by a specially created private law corporation, the Hessische Industriemüll GmbH, owned 27% by Hesse and 73% by the generators. This corporation also disposes of current wastes with the costs covered by fees levied on dischargers. Interview with Prof. Dr. Michael Bothe, Faculty of Law, J.W. Goethe University, Frankfurt am Main, Germany (July 7, 1993). Gary Davis and Joanne Linnerooth report that at the time of their study, Hesse heavily subsidized this corporation. Davis and Linnerooth, *Government Ownership of Risk* in Piasecki and Davis, ed., *America's Future* at 103-06 (cited in note 72). See also Church and Nakamura, *Cooperative and Adversary Regimes* at 24-25 (cited in note 93).

98. Erhard Blankenburg, *The Waning of Legality in the Concept of Policy Implementation*, 7 L. & Policy 481, 484-85 (1985). Blankenburg's remarks build on a detailed series of case studies performed by Jochen Hucke, Axel Müller, and Peter Wassen, *Implementation kommunaler Umweltpolitik* (Campus, 1980). Blankenburg reports that, for waste disposal in general, local authorities tend te be stricter when industrial waste problems are small and more lenient when they are large. He recognizes that uniform federal standards might be undesirable, but he fails to notice that a policy of poorly enforced strict standards is unlikely to produce the optimal amonnt and type of variability in treatment levels and discharges. Blankenburg, 7 L. & Policy at 484-85.

99. Gary Davis and Joanne Linnerooth describe how the wealthy Länder of Hesse and Bavaria subsidize hazardous waste management activities from general public funds and also charge the companies that generate waste. Davis and Linnerooth, *Government Ownership of Risk* in Piasecki and Davis, eds., *America's Future* at 101-06 (cited in note 72).

Länder.[100] Thus far, the response has been ad hoc. The federal government has financed cleanup programs through the Treuhandanstalt, which is organizing the privatization of the east.[101] But this initiative is only a stop-gap because the Treuhand has many other concerns and is a transitional agency. Clearly, Germany needs to find ways to avoid the severe distributive inequities produced by the combination of its federal structure and a liability system that relieves past waste generators of responsibility.

German recycling policy presents a different type of problem. Germany is putting highly restrictive packaging regulations into place throughout the country. The regulations impose a stringent set of collection and recycling requirements.[102] An ordinance requires both packaging manufacturers and product distributors to take back and recycle transport packaging materials. In practice, this means that firms must arrange for the transport packaging to be reused or recycled. It is not necessary to ship the empty packages back to the producer.[103] Product distributors are required either to accept returned primary packaging or to participate in a privately-financed system that collects packaging from households.[104] The ordinance includes quotas, which rise over time, on the amount of packaging collected and on the percentage recycled.[105] Choosing the second option, German industry established a private company called Duales System Deutschland ("DSD") that has been given the exclusive right to collect and recycle products marked with a "*Grüne Punkt*" (green dot) symbol. It operates in ninety-five percent of German cities and

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100. GG, Arts. 104a, 106, 107; 39 BVerfGE 96 (1975); 41 BVerfGE 291 (1976); 72 BVerfGE 330 (1986).

101. See Dr. Bertram Wieczorek, *Ziele der Bundesregierung zur Erfassung, Sicherung und Sanierung von Altlasten in den neuen Bundesländern*, Umwelt 139 (Apr. 1993). The federal government, acting through the Treuhandanstalt, provides 60-75% of the funding. The remainder is provided by the Länder.

102. Verpackungsverordnung (Ordinance on the Avoidance of Packaging Waste) of June 12, 1991 ("VerpackVO"). For an excellent general overview and evaluation of the ordinance, see generally Bette K. Fishbein, *Germany, Garbage, and the Green Dot: Challenging the Throwaway Society* (INFORM, 1994) ("*Green Dot*").

103. VerpackVO, Art. 4; Fishbein, *Green Dot* at 33-41.

104. VerpackVO, Art. 6; Fishbein, *Green Dot* at 48-81. In addition, VerpackVO Arts. 7-9 require sellers to accept the return of and charge deposits on most drinks, packaging, and packaging of washing and cleaning agents and emulsion paints. Fishbein, *Green Dot* at 82-98.

105. VerpackVO, Annex to Art. 6, ¶ 3; *Recycling Germany: A Wall of Waste*, Economist 75 (Nov. 30, 1991); *Abolishing Litter*, Economist 59 (Aug. 22, 1992); Rüdiger Jungbluth, *Ein Schritt zur Müllvermeidung*, Der Tagesspiegel 35 (Dec. 1, 1991). By July 1, 1995, 80% of packaging waste must be collected. Under its original provisions, the law requires not only collection, but sorting for recycling and reuse. Of the waste collected, 90% of glass and metal must be recycled and 80% of some plastics and paper by July 1, 1995. Germany is also considering a statute to require manufacturers to take back discarded products as well as packaging. Fishbein, *Green Dot* at 131-51.

districts and is financed by fees paid by companies who place the green dot on their products.[106]

The system is reducing the tonnage of packaging materials.[107] It has come under attack, however, because of the DSD's monopoly power and the expense and rigidity of the program.[108] Despite its monopoly status, the DSD has been a money loser that several large companies bailed out of in the summer of 1993.[109] In addition to alleged management problems, there are two main reasons for this shortfall. First, many companies use the green dot without paying, and second, consumers have an incentive to use the DSD bins for nonpackaging waste since the DSD system is free and most municipalities charge for waste collection.[110] Monopoly complaints come from both small recyclers that accuse the DSD of overcharging for waste and from those who accuse the firm of inefficient waste collection practices.[111] Much of the waste collected has been exported to other countries, and critics charge that the nation is not meeting its recycling targets.[112] The DSD collected more plastic than expected and large quantities have piled up in storage areas.[113] The Federal Environmental Minister is seeking to reduce the quotas for recycling and to make other changes in the regulation.[114]

The program is both too centralized and too decentralized. The law inefficiently limits the disposal and recycling choices of *Länder* and manufacturers, yet fails to impose uniform federal packaging standards in situations in which they would cut costs.[115] Nevertheless, the underlying "polluter pays" principle is sound.

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106. Fishbein, *Green Dot* at 49-81; Araine Genillard, *Falling Victim to Its Own Success—Germany's Recycling Scheme is Under Attack from Both Industry and Environmentalists*, Financial Times 16 (Jan. 27, 1993).

107. In 1992, packaging materials fell by half a million tons, or 3.1% from the previous year. *Trendwende beim Packmitteleinsatz*, Umwelt 364 (Sept. 1993).

108. Fritz Vorholz, *Punkte gegen die Umwelt*, Die Zeit 8 (Jan. 14, 1994); Genillard, Financial Times at 16 (cited in note 106); Fishbein, *Green Dot* at 113-30 (cited in note 102).

109. Vorholz, Die Zeit at 8; Fishbein, *Green Dot* at 59-60, 197-200.

110. Fishbein, *Green Dot* at 60.

111. Genillard, Financial Times at 16 (cited in note 106); *Töpfers Entwurf für neue Verpackungsverordnung*, Handelsblatt 1 (Dec. 29, 1993).

112. Genillard, Financial Times at 16. The Environmental Ministry admits that a problem exists for the recycling of plastic. *Trendwende*, Umwelt at 364 (cited in note 107).

113. Fishbein, *Green Dot* at 199-200 (cited in note 102).

114. *Töpfers Entwurf*, Handelsblatt at 1 (cited in note 111); Fishbein, *Green Dot* at 200-01.

115. For example, one of the main problems with plastics recycling is that some kinds of plastic cannot he combined. Federal standards for plastics could solve this incompatibility. As yet, Germany (like the United States) has no such regulations. Letter to the Author from Prof. Dr. Gerd Winter, Faculty of Law, University of Bremen (July 29, 1993) (on file with the Author). Bette Fishbein mentions the special problems of Polyvinyl Chloride. Fishbein, *Green Dot* at 107-09.

Manufacturers should take into account the disposal and recycling costs of packaging materials and products. The German ordinance, however, assumes that recycling and refilling is desirable without adequately considering the monetary and environmental costs of alternatives.[116] It rules out a whole range of potentially cost-effective alternatives for waste collection. The quotas in the law appear to bear little relation to the relative benefits of recycling versus other methods of disposal. This overriding weakness in the ordinance, more than the particular failures of implementation, has left Germany with a system that, in spite of the central role of private business, cannot be described as a successful merger of environmental goals and economic incentives.[117]

VIII. RESPONDING TO GLOBAL PROBLEMS

Both Germany and the United States recognize the global nature of ozone depletion in the upper atmosphere, global warming, and biodiversity. Ozone depletion has proved easiest to resolve, and an international protocol with some bite promises to ameliorate the problem.[118] New evidence on the existence of an ozone hole over the northern temperate zone spurred Germany, the European Union, and the United States to announce faster schedules to eliminate ozone-

116. Studies of the relative costs and benefits of one-way versus refillable bottles are inconclusive. Fishbein, *Green Dot* at 84-85.

117. Within the constraints imposed by the law, however, the DSD has rationalized its pricing structure. In 1993 it changed its fees to reflect the relative (average) costs of collecting and sorting various materials. It also shifted from fees based on package volume to fees based on weight because it believed that weight was a better proxy for its own costs. For example, the new fees are DM 3 per kilogram for plastic and DM 0.16 per kilogram for glass, rates which translate into DM 0.087 per liter for a plastic beverage container, compared with DM 0.058 for a one-liter glass bottle. These fees, however, take no account of the costs of recycling beyond the collecting and sorting costs of the DSD. Fishbein, *Green Dot* at 61-65.

118. The agreement, called the Montreal Protecol, was signed in September 1987 by 25 participants, including the United States and Germany. Fifty-six countries signed the London Amendments to the Protocol in June 1990. The original document required a 50% reduction in the consumption and production of chlorofluorocarbons ("CFCs") by 1999. The 1990 Amendments speed up that timetable and contain provisions designed to aid poorer countries in reducing CFCs and other ozone depleting chemicals. Gallagher, 14 Houston J. Int'l L. at 283-305 (cited in note 4); Glenn B. Raiczyk, *Montreal Protocol on Substances that Deplete the Ozone Layer: Conferenee Calling for Accelerated Phase-Out of Ozone-Depleting Chemicals is Planned for 1992*, 5 Temple Int'l & Comp. L. J. 363, 369-73 (1992).

Of course, in this field, as in others, there is considerable disagreement among experts about the seriousness of the problem. Despite several large-scale research projects, doubt remains about the contribution of chlorofluorocarbons to the thinning of the ozone layer and about the link between a damaged ozone layer and skin cancer and other harms. McInnis, *Ozone Layers* in Greve and Smith, eds., *Environmental Politics* at 131-35 (cited in noto 6).

depleting chemicals,[119] and led to the amendment of the international protocol in late 1992.[120] The American chemical industry supported the original protocol because unilateral American restrictions on the use of these chemicals had hurt their competitiveness. Thus, the industry wanted global restrictions imposed to level the playing field.[121] The case is an example of how national regulation of a global problem, while ineffective as a long-term strategy, can turn opponents of regulation into political allies.[122]

The problems of global warming and biodiversity are proving more difficult to resolve. Both are plagued by vexing empirical problems that complicate the policy debate. While global warming is a relatively well-defined phenomenon, biodiversity is a catchword for a

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119. Evidence that ozone depletion was occurring not only at the poles, but also over the central regions of the earth was reported by the United States National Aeronautics and Space Administration in both 1991 and 1992. Gallagher, 14 Houston J. Int'l L. at 277; Raiczyk, 5 Temple Int'l & Comp. L. J. at 367. The United Nations reported on ozone depletion in October 1991. *Stratospheric Ozone Hole Found to Occur in Mid-Hemisphere, New Information Shows*, 14 Int'l Envir. Rep. (BNA) 590 (Nov. 6, 1991). Faster timetables were announced by the United States in February 1992 and proposed by the European Commission in March 1992. The 1992 European Community proposal is compared with earlier standards and the amended Montreal Protocol in R. Andreas Kraemer, *Implementation of the Montreal Protocol in Industrialised Countries*, Envir. L. Network Int'l Newsl. 11, 13 (Feb. 1992). See also Raiczyk, 5 Temple Int'l & Comp. L. J. at 373-74; Keith Schneider, *Bush Orders End to Ozone Destroyers by 1996*, N.Y. Times A18 (Feb. 12, 1992); *Hole-Stoppers: CFCs Will Be Phased Out Faster Than Once Expected, But This May Be Costly*, Economist 76 (Mar. 7, 1992).

In May 1991, Germany promulgated a regulation prohibiting certain ozone-depleting halogenated hydrocarbons (FCKW-Halon-Verbots-Verordnung). The ordinance goes beyond the Montreal Protocol and EC regulations. If the ordinance is enforced, Germany will stop using fully halogenated CFCs and halons by 1995. German Federal Ministry for the Environment, *Environmental Protection in Germany: National Report of the Federal Republic of Germany for the United Nations Conference on Environment and Development in June 1992 in Brazil* 136 (1992); Raiczyk, 5 Temple Int'l & Comp. L. J. at 375.

120. Kraemer, Envir. L. Network Int'l Newsl. at 12; Bronwen Maddox, *Ozone Hole Rescue Moves Lead to a Tussle*, Financial Times 6 (Nov. 23, 1992); *A Quick Fix on Ozone*, Economist 50 (Nov. 28, 1992). The 93 nations meeting in Copenhagen in November 1992 agreed to set up a fund to help poor countries, to tighten the timetable to phase out chlorofluorocarbons, and to add two new substances to the restricted list.

121. McInnis, *Ozone Layers* in Greve and Smith, eds., *Environmental Politics* at 141-44 (cited in note 6). Daniel McInnis demonstrates that the American chemical industry would have earned substantial oligopoly profits under the original protocol's restrictions on production because they had a head start on the development of substitutes. Id. at 147-49. However, subsequent amendments that speeded up the timetables cut these gains. Id. at 149-50.

122. See generally Snsan Rese-Ackerman, *Does Federalism Matter? Political Choice in a Federal Republic*, 89 J. Pol. Econ. 152 (1981) (discussing this phenomenon). In the American federal system, where states have substantial independent regulatory authority, the regulation of automobile exhaust followed this pattern. California passed a law stringently regulating automobile exhaust. As a consequence, the automobile industry began to support preemptive federal legislation. Similar to the case of CFCs, however, the subsequent federal law was so strict as to cast doubt on the wisdom of the industry's strategy. For an analysis of this case, see generally E. Donald Elliott, Bruce Ackerman, and John Millian, *Toward a Theory of Statutory Evolution: The Federalization of Environmental Law*, 1 J. L. Econ. & Org. 313 (1985).

range of concerns, from the preservation of appealing individual species to the management of threatened ecosystems. Furthermore, even if the scientific disagreements over the extent of species depletion could be resolved, deep conflicts over competing values complicate the search for international solutions. A final source of dispute is the distribution of costs; developing countries argue that they should not have to bear the costs of their late development.

Both global warming and biodiversity were on the agenda of the 1992 Rio Conference organized by the United Nations. The United Nations Framework Convention on Climate Change signed at the conference has neither clear timetables nor goals for reducing the level of greenhouse gases.[123] American negotiators reportedly feared that such timetables would have more legal force in the United States than elsewhere. In the aftermath of this agreement, however, both the European Union and the United States set a target of reducing their own carbon dioxide levels to 1990 levels by the year 2000.[124] It is not clear, however, what these targets mean. In the United States, the Clinton Administration proposed only voluntary compliance programs for substances that contribute to global warming.[125] In 1990, the German Cabinet committed itself to reducing carbon dioxide emissions to seventy-five percent of 1987 levels by 2005. But this policy is a goal, not a legally binding condition.[126]

Furthermore, stronger measures not required by the Convention, such as taxes on carbon to reduce greenhouse gases, are unlikely in the near future. The United States has not endorsed a carbon tax, and the European Union's backing for a tax on carbon is conditioned on the agreement of all members of the Organization for

123. *UNCED: Rio Conference on Environment and Development*, 22 Envir. Policy & L. 204, 207 (1992). For the text of the Convention, see *United Nations Framework Convention on Climate Change, April 30-May 9, 1992*, 22 Envir. Policy & L. 258-64 (1992). The Convention had been ratified by 55 of the 160 signatory nations by February 1994. It went into effect March 21, 1994. *U.N. Conference Finds Greenhouse Gases Must Be Cut*, Reuters (Feb. 18, 1994) (available on LEXIS, NEWS library, REUWLD file). The United States was the first industrial nation to ratify the treaty in October 1992. *Earth Summit's Effectiveness Questioned a Year Later*, Nat'l Pub. Radio, Morning Edition (June 7, 1993) (available on LEXIS, NEWS library, NPR file).

124. *UNCED: Rio Conference*, 22 Envir. Policy & L. at 207; *U.S. Signs Accord on Biodiversity*, Chi. Trib. § 1, at 14 (June 5, 1993).

125. Margaret Kritz, *Lukewarm*, Nat'l J. 2028-31 (Aug. 14, 1993); John H. Cushman, Jr., *Clinton Urging Voluntary Goals on Air Pollution*, N.Y. Times A23 (Oct. 19, 1993).

126. See generally Jeannine Cavender and Jill Jäger, *The History of Germany's Response to Climate Change*, 5 Int'l Envir. Aff. 3 (1993) (providing a history of the climate change policy debato in Germany). The authors stress the role of the nuclear industry, particularly in the aftermath of Chernobyl, in using fears of the greenhouse effect as an argument for nuclear power.

Economic Cooperation and Development ("OECD").[127] The German environmental minister supports a carbon tax only in the framework of such a broad initiative.[128] The fear of competitive losses prevents any country or group of countries from acting unilaterally, and international institutions are not strong enough to impose a solution.

More progress is being made on biodiversity. Germany signed the biodiversity treaty at the Rio Conference, though the United States did not. The Clinton Administration signed the treaty in June 1993.[129] Bush Administration fears that the treaty might harm intellectual property rights were apparently exaggerated because the Industrial Biotechnology Association, representing 80% of the industry, endorsed the treaty.[130] This situation may be another case of an industry that fears unilateral American action favoring an international agreement that imposes similar restrictions on all producers.[131]

The mixed record on the greenhouse effect and biodiversity suggests that global problems imposing heavy costs on advanced countries will be difficult to solve. Limits on greenhouse gases will raise energy costs world-wide. Although the immediate costs will fall

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127. Bronwen Maddox and Paul Needham, *Business and the Environment: German Industry Snubs Carbon Tax*, Financial Times 18 (Sept. 30, 1992).

128. At Rio, Chancellor Kohl stated that Germany planned a 25-30% cut in carbon dioxide emissions by 2005 relative to 1987 levels. Environmental Minister Klaus Töpfer claims that a carbon tax is necessary to meet this goal—a method opposed by German industry. Id.

129. *U.S. Signs Accord*, Chi. Trib. § 1, at 14 (cited in note 124). While the pact has been sent to the Senate, it has not yet been ratified by the United States. The Convention entered into force on December 29, 1993 once it had been ratified by 30 countries. *Current Report*, 17 Int'l Envir. Rep. (BNA) 3 (Jan. 12, 1994).

130. The Biodiversity Convention would encourage the transfer of biotechnology to developing countries. United Nations Conference on Environment and Development, Convention on Biological Diversity, June 5, 1992, Art. 16, §§ 1-2, 31 I.L.M. 818, 829 (1992) ("*Biological Diversity Convention*").

> The U.S. was afraid that the Convention . . . might slow down the application and industrialisation of bio-technologies and would not afford protection for intellectual property and could reduce royalties, especially for pharmaceutical companies, needing vital raw material, for life-saving drugs. . . . The U.S. was, however, the only industrialised country not to have signed the Convention.

UNCED: Rio Conference, 22 Envir. Policy & L. at 207 (cited in note 123). See also Graeme Browning, *Biodiversity Battle*, Nat'l J. 1827-30 (Aug. 8, 1992). Browning suggests that the Industrial Biotechnology Association, representing 80% of the industry, could have accepted the treaty. Id. at 1829. In fact, the langnage of the Convention is protective of intellectual property. Article 16, section 2, in discussing technology transfers te developing countries states: "In the case of technology subject to patents and other intollectual property rights, such access and transfer shall be provided on terms which recognize and are consistent with the adequate and effective protection of intellectual property rights." *Biological Diversity Convention*, 31 I.L.M. at 829.

131. In the spring of 1993 the industry was urging the Administration to sign so that the United States could participate in the international negotiations over the interpretation of the intellectual property portions of the treaty. 10 Int'l Trade Rep. (BNA) 961 (June 9, 1993).

heavily on newly developing countries, such as China, global limits will affect all users of fossil fuels. These costs could be substantial if stringent limits are imposed. Efforts to subsidize poorer countries would further increase the burden on wealthier ones.

In contrast, preserving species by preserving tropical rain forests is a perfect political issue for industrially developed countries. Germany has no tropical rain forests, and the United States has only small enclaves in outlying areas. Political actors can claim great concern,[132] but make clear that global cooperation is necessary. If such cooperation is not forthcoming, then little can be done at home.[133] Possible unilateral responses, such as limiting the import of tropical woods, have the advantage of being supported by domestic competitors.[134] Even when the global treaty on biodiversity goes into effect, it will impose only marginal costs on major industrial powers.

IX. CONCLUSION

The U.S. constitutional structure places no constraints on the assignment of environmental responsibilities to different levels of government so long as the Interstate Commerce Clause is not violated. As a result, strong federal statutes exist in most areas of environmental protection. The German constitution is more specific in assigning environmental responsibilities and mandates that the states administer most federal regulatory programs. The constitutional assignment of responsibilities to government levels in Germany is inefficient in failing to account adequately for the geographical extent of pollution problems.

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132. Germany's politicians are on record as being concerned about endangered species and the loss of the rain forest. Dr. Klaus Töpfer, *Abrüstung zwischen Mensch und Natur*, Das Parlament 6 (June 5, 1992). According to Environmental Minister Töpfer, "international species protection must have priority over the economic interests of individual states and traders." Gabrielle Wille, *"The Future's Ark" Mustn't Become Empty*, press release, Inter Nationes 2 (1992). According to Chancellor Kohl: "The destruction of the tropical rain forest and the hole in the ozone layer . . . concern the people of Latin America, just as much as those in Europo and in all the continents of the world." *250 Millionen DM für den Regenwald*, Umwelt und Entwicklung 1 (Nov. 1991).

133. Similar points were made by opposition party members in the Bundestag debate over the Rio Conference. Günter Pursch, *Regierungserklärung zum Rio-Umweltgipfel: Zwischen Chancen und Skepsis*, Das Parlament 1 (June 5, 1992).

134. Monetary contrihutions to international projects can also be good for one's image without imposing much pain. Thus, Germany has contributed DM 250 million to help fund a three-year pilot project on rain forest preservation sponsored by the World Bank. This contribution is 15% of the project's budget. See *Tropenwalderhaltung*, Umwelt 13 (Jan. 1992); *Ein Alarmsignal zum Handeln*, Umwelt und Entwicklung 6, 7 (Dec. 1991).

Both Germany and the United States have statutes that fail to recognize the complex regional and interregional character of air and water pollution. Lawmakers give existing jurisdictional boundaries too much weight in policy and implementation. In the United States federal laws frequently impose too much uniformity on the country in the form of treatment requirements or discharge levels. The German focus on licenses and on state and local control of implementation creates particular difficulties in dealing with pollution that crosses political borders.

With regard to local problems, the cleanup of existing hazardous waste sites shows how a seemingly local problem can require national intervention in the presence of mobile firms and income disparities. The U.S. solution recognizes these national concerns, but does so in a cumbersome, rigid, and costly way. The German solution places too much responsibility for cleanup on the *Länder*. Recycling policy is a counter-example to my general claim that Germany is too decentralized. Germany is much farther along the recycling path than the United States, but the government has designed an excessively standardized scheme.

The failure of the international community to deal sensibly with global problems cannot be blamed on either Germany or the United States although the involvement of both countries is necessary for further progress. International cooperation may be facilitated by U.S. statutes that give industry an incentive to seek global solutions. This possibility provides a political-economic justification for domestic polices that otherwise would appear ineffective.

In short, the constitutional and statutory assignment of environmental responsibilities in both countries leaves much to be desired. Germany puts too much emphasis on implementation by state and local governments; the United States, too little. Yet, the underlying problems are more subtle than this simple generalization. Germany contains examples of excessive centralization, and the United States delegates some decisions with interjurisdictional consequences to lower-level governments. In both countries, existing political jurisdictions are not well fitted to the reality of many environmental problems. Germany and the United States need to recognize more fully the complex regional and interjurisdictional character of pollution.