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Out of the Backyard: The Problems of Hazardous Waste Management at a Global Level

KATE O'NEILL

This article explores recent developments in the regulation of the international hazardous waste trade. It begins with the move in recent years toward banning the North-South waste trade and shows how this ban reflects a particular specification of the waste trade, as a transboundary environmental issue whereby domestic waste management problems are seen as issues of sovereign national responsibility. It examines another way of formulating the waste trade: as a symptom of more fundamental problems afflicting waste management sectors in most industrialized countries. Without taking this perspective into account, the ban on the waste trade is likely to fail. The final section is more optimistic, examining how certain countries—Britain, France, Germany, and Australia—are formulating policy change in ways likely to have an impact on the waste trade, drawing conclusions about how the role of international authorities might be revised in the light of these developments.

The management and disposal of hazardous wastes is no longer a problem just for national regulatory agencies and officials. These issues have, in many cases literally, spilled over into the international arena, and very few, if any countries, are now completely self-sufficient in waste disposal. This globalization of waste management has many manifestations, including the increasingly multinational scope of waste disposal firms and the protracted and still inconclusive negotiations over ocean dumping of wastes. However, by far the most visible—and controversial—symptom of the extent to which issues of hazardous waste management and disposal have become international in their effects is through the international trade of wastes. This trade first emerged into the public eye in the 1970s and rose on the international policy agenda as a result of several egregious cases of waste dumping by firms and waste brokers from the United States and Western Europe into unprotected communities in Africa, Latin America, and the Caribbean. Less well known is that whereas roughly 20% of wastes have been shipped from developed to less developed countries, the remaining 80% of the trade occurs between member states of the Organization for Economic

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Cooperation and Development (OECD) and is legal according to most domestic laws and international conventions (Montgomery, 1995; Organization for Economic Cooperation and Development, 1993).

This article explores recent developments in the regulation of the waste trade, both at the international level and at the level of individual nation states. It begins with the move in recent years toward a global ban on waste trading from North to South, and it draws out how this ban reflects a particular specification of what the waste trade problem is all about, that it is seen primarily as a transboundary environmental issue. Under this view, domestic waste management problems are seen as issues of sovereign national responsibility. The article then examines another way of formulating the waste trade, as a symptom of more fundamental problems afflicting the waste management sectors in most industrialized and some less industrialized countries, and it argues that without taking this perspective into account, the ban on the waste trade is likely to fail. The final section is more optimistic: It examines how certain countries—Britain, France, Germany, and Australia—are formulating policy change in ways likely to have an impact on the waste trade, before going on to draw some conclusions about how the role of international authorities might or should be revised in the light of these developments.

Transformation of an International Regime: Convergence on a Waste Trade Ban

In recent years, the international regime governing the hazardous waste trade has undergone a remarkable transformation in terms of its underlying rules and principles. The main, but by no means the only, international agreement governing waste trade is the United Nations Environment Programme (UNEP)-sponsored Basel Convention on the Transboundary Movement of Hazardous Wastes and Their Disposal, which was signed in 1989 and came into effect in 1992. Other related agreements include the 1991 Bamako Convention, and the Lomé IV Convention of 1989 (between the member states of the European Community and their former colonies in Africa, the Caribbean, and the Pacific), as well as a number of bilateral agreements, usually between neighboring states such as the United States and Canada or Mexico, or between Germany and France. Several regional agreements exist as well, such as the Izmir Protocol of the Barcelona Convention, signed in 1996, and governing waste trading in the Mediterranean area (Cubel-Sánchez, 1997), and the Waigani Convention, part of which addresses waste dumping in the South Pacific and was signed in September 1995 (Hyman, 1997). The European Union (EU) has been active in regulating waste trading among its member states, issuing a number of directives on the

subject, and the OECD Secretariat in Paris is an important force in issuing relevant guidelines and data.

Three or 4 years ago, it was almost impossible to identify any unity of purpose among the complex set of agreements that together made up the international regime. For example, whereas some agreements, such as Bamako and Lomé IV seek to ban the trade, others sought merely to monitor and/or restrict the trade, whereas others, including most bilateral agreements, even sought to facilitate it. The Basel Convention, in its earliest incarnation, sought merely to monitor and restrict movements of wastes from richer to poorer nations based on the principle of prior informed consent. Written permission had to be obtained from the authorities in waste-importing countries, and the onus was on waste exporters to ensure that wastes were disposed of in an environmentally sound manner. This formulation led to many objections from nongovernmental organizations (NGOs), such as Greenpeace, and from countries in Africa, Latin America, and the Caribbean, who had been the recipients of several lethal cargoes from the United States and some European countries, making it possibly the most unpopular international environmental agreement signed to date.

In the last 5 years or so, these agreements have, primarily as a result of vociferous objections to the Basel Convention, all converged toward one principle that has (not without dissension) been accepted by most contracting parties: that the movement of hazardous wastes, especially from richer to poorer nations, but also among the relatively equivalent member states of the EU, should be banned. Under the terms of the Basel Convention, this ban, including halting the movement of waste materials destined for recycling or recovery, comes into effect in January 1998. The EU, for its part, is attempting to move toward the principle of self-sufficiency in waste disposal by its member states, following on the heels of a protracted debate over the status of traded wastes as a good.

The argument presented in this article is that, especially in the absence of effective monitoring and enforcement arrangements at the level of the international system, this ban is unlikely to work and, indeed, could prove counterproductive without the conditions underlying the waste trade being seriously addressed. The waste trade regime, as represented by these different agreements, only addresses the actual transfrontier movement of wastes, without taking into account the veritable crisis afflicting waste management and regulatory systems in many industrialized countries, where waste generation far outstrips the facilities available to dispose of hazardous wastes safely. In fact, the Basel Convention and associated agreements are unusual in the set of international environmental agreements in that they set no targets for reducing the production of the pollutant in question.

Thus, managing the hazardous waste trade should be looked at not simply from the perspective of controlling actual transfrontier move-

ments of wastes but also from the need to reduce hazardous waste generation and/or better control the firms that generate and dispose of hazardous wastes at the national level. Among OECD countries, most governments have announced policy positions favoring controlling or banning the trade. However, without being backed up by more fundamental, and usually policy-induced, changes in actor behavior, these pronouncements are almost bound to be ineffectual. For example, the British government announced a ban on waste importation in 1991 that has yet to come into effect. On the other hand, recent policy measures that address waste disposal problems as a whole are beginning to come into effect, as the final section of this article shows.

Problem Framing, International Environmental Policy Making, and the Hazardous Waste Trade

In any area of policy making, problem framing, or how policy issues are perceived, makes a decisive difference in policy choices and outcomes, and the area of international environmental policy is no exception. One of the central propositions of scholarly work in this field is that the form of international environmental agreements is driven by the structural characteristics of the issue in question (Downie, 1994) and that the closer the fit between issue characteristics and institutional design, the more effective the regime is likely to be. For example, negotiations over ozone layer depletion involved multilateral bargaining among many countries and set up a structure that not only included a phase-out timetable for the production of ozone-depleting substances but also contained mechanisms for financial transfers to countries needing help in covering adjustment costs to safer products.

The most commonly used typology of global environmental problems differentiates among them on the basis of scope. It covers degradation of the global commons (the atmosphere and the oceans), transboundary issues—where pollution is generated in one country, but its effects are felt beyond national boundaries (as in acid rain and transboundary river pollution)—and local issues, which have cumulative effects on the global environment, or which are of common concern to a number of states (such as species depletion and population growth).¹ Following this division, it is possible to frame the issues underlying the hazardous waste trade in two ways, first as a strictly transboundary issue, and second, as a local environmental issue but one that is both ubiquitous across countries and ultimately cumulative in its effects. The interna-

1. For examples of this work, see Porter and Brown (1995), Young (1994), and Haas, Keohane, and Levy (1993). For a different take, see Turner, Kasperson, and Meyer (1990), who identify two types of global environmental change: systemic and cumulative.

tional regime, including agreements regulating north-south trade and those regulating intra-EU or OECD trade, have to date addressed almost exclusively the transfrontier aspects of the trade, seeking to monitor and in most cases to prevent the physical transportation of wastes across national boundaries.

There are several reasons why this specification of the problem has dominated the international policy agenda. First, pressures to regulate the trade emerged out of concern with equity issues associated with the dumping of wastes from rich to poor nations. The environmental justice issues involved in the waste trade are familiar, and clear-cut: Waste dumping on countries and populations ill equipped to dispose of toxic substances safely is an example of environmental colonialism at its worst, symbolizing the extent to which industrialized countries are willing to off-load their environmental problems onto poorer nations.² Following the blaze of publicity given to cases of illegal waste dumping, many less developed countries, particularly African countries, have, with the support of international environmental organizations such as Greenpeace, begun to refuse waste shipments from the industrialized world. In fact, the number of (documented) proposed waste schemes now far outweigh those that go ahead (Montgomery, 1994, 1995; Vallette & Spalding, 1990).³

Second, there are significant transboundary externality effects associated with the international transportation of wastes (Copeland, 1991; Helm & Pearce, 1990). In the absence of an international governing authority, these effects are heightened by the absence of mechanisms for assigning cross-jurisdictional liability. The waste disposal industry is also a special sort of service industry, one in which the results are invisible to the purchaser of these services, here, firms who generate wastes (Wynne, 1987). This creates a different set of incentives compared with those governing transactions in normal goods or other services. On the one hand, exporters—particularly if they happen to be intermediaries or waste brokers—have little self-interest in ensuring that the wastes arrive at their ultimate destination, and, on the other, importers have a financial incentive to import more wastes than are socially desirable (Wynne, 1989, p. 123).

2. On the illegal waste trade, see Vallette and Spalding (1990), Third World Network (1989), Clapp (1994), Crooks (1993), Heller (1994), Puckett (1992), Singh and Lakahan (1989), and Strohm (1993). This literature draws on the extensive work done on the environment and social justice issues in the U.S. context. On this, see, for example, Bryant and Mohai (1992), Bullard (1991), and Newman (1994).

3. According to Montgomery (1995), and indeed to the Greenpeace figures, "between 1970 and 1990, Greenpeace uncovered 103 proposals to ship hazardous waste to developing countries. Of the 103 proposals, only 16 resulted in a transfer of hazardous waste across an international boundary" (p. 6). Exports to middle-income countries—notably east central Europe—over the same period were much higher—with waste transportation occurring in 41 out of 98 proposed schemes (p. 8).

Finally, this formulation fits the role to which the UNEP in particular is constrained in the international system, whereby it usually has to act on whatever consensus or focal point emerges among the opinions of its members. It also fits the view that waste management is an insoluble problem best left for individual governments, aid agencies, and, increasingly, private firms to address. Most countries define and categorize hazardous wastes in radically different ways, and there is no international clearinghouse for information about wastes in transit, their country of origin, or their ultimate destination.⁴ At the moment (or up until the full implementation of the Basel Convention), international and regional organizations, such as the OECD and Greenpeace International, provide the best information on these issues, although with extreme caveats as to the comparability of much of the data they put out. The provision of such information and the adoption of an international definition and classification scheme for hazardous wastes would certainly reduce transactions costs, functions best provided by some form of international institution.

Whereas focusing on the transfrontier aspects of the waste trade addresses the most urgent aspects of the problem, a ban on waste trading, as exemplified by the new terms of the Basel Convention, downplays questions of waste generation and management and is unlikely to meet with full compliance on the part of signatory states. It also fails to address the full significance of hazardous waste management problems embodied in the trade. There are several reasons why this is so. First, the transboundary view treats waste disposal as a separate issue from waste production. By focusing solely on the midstream part of the waste life cycle, it ignores the possibility for enacting effective controls at the downstream end. Second, waste management systems in developed countries are currently under extreme pressure, and although the waste trade has acted as a safety valve in the past, current international controls are making that option (appropriately in many cases) less available. More significant, current trends predict that as the newly industrialized and less developed economies grow, they will increase their production of industrial and hazardous wastes. In the absence of effective environmental regulations, including waste management systems in these countries, the waste problem threatens to become truly global in scope.

A final reason why a waste trade ban might fail is that there is a lack of fit between long-standing domestic and the more recent international policy agendas in this area. Some of the more successful international environmental agreements, for example, covering the protection of the ozone layer or the prevention of long-range transboundary air pollution,

4. See Dowling and Linnerooth (1987) and Forester and Skinner (1987) for a discussion of different national hazardous waste definition and classification schemes, as well as management practices.

filled a relatively empty policy space at the domestic level. On the other hand, most industrialized countries, as the next section shows, have a plethora of waste regulations, to do primarily with ensuring safe disposal of wastes at home. Widening the scope of these regulations to include banning transfrontier movement of wastes adds one more task to already overburdened domestic agencies and removes one of the disposal options in the case of waste exporters.

These concerns point to the possibility that the problem of waste trading, as it has been framed in international diplomatic circles, downplays and, indeed, ignores some of the central problems of global waste management, problems that would be encompassed by reconceptualizing the trade differently: as a function—indeed, the most visible symptom at the international level—of domestic-level problems of waste management, shared, although in different forms, by most industrialized countries. Thus, although environmental damage resulting from waste disposal is primarily local in terms of its effects, waste management problems are ubiquitous across countries and display important transboundary effects, both of which can be considered to be cumulative across countries. This framing of the problem leads to analytical parallels with, for example, the trade in tropical timbers and how that relates to tropical deforestation, parallels that are more apt than with the classic transboundary issues of long-range air or river pollution. The next section examines some of the reasons waste management has become such a problematic and controversial issue in industrialized countries in recent years and how these domestic problems have spilled over into an international trade in wastes.

Waste Management in Crisis: Developed Countries and the Waste Trade

As Wynne (1987) argues, “in most countries, hazardous waste management is in a state of internal flux and public strife. International controls are crippled by problems and divergences in national approaches” (p. 25). This crisis has its roots in a complex mix of political, economic, and cultural factors. At a very basic level, amounts of hazardous wastes being generated continue to increase worldwide, without a concomitant rise in disposal capacity: According to OECD figures, annual hazardous waste generation across its member states increased by roughly 65 million tonnes in the early 1990s alone (Organization for Economic Cooperation and Development, 1997) (see Table 1). The waste trade is in part a function of the need to fulfill the demand for waste disposal services; it is also—crucially—dependent on countries, or actors within countries, being willing to accept wastes from abroad. In most industrialized countries, this has occurred when industrial interests have

Table 1
Generation of Hazardous Waste by Country, OECD Members

	1994		1997	
	Year Reported	Generation of Hazardous Wastes (1,000 tonnes)	Year Reported	Generation of Hazardous Wastes (1,000 tonnes)
Australia	n.d.	300	1992	426
Austria	1991	620	1995	915
Belgium	n.d.	27,000	1994	27,530
Canada	1990	6,080	1991	5,896
Denmark	n.d.	112	1993	91
Finland	1987	250	1992	367
France	1992	7,000	1992	7,000
Germany	1990	6,000	1993	9,020
Greece	1990	423	1992	450
Ireland	n.d.	66	n.d.	66
Italy	1991	3,246	1991	3,387
Japan	n.d.	666	n.d.	666
Netherlands	n.d.	1,500	1993	2,600
New Zealand	1982	60	1990	110
Norway	1990	200	1991	220
Portugal	1987	1,043	1994	1,365
Spain	1987	1,708	1987	1,708
Sweden	1985	500	1985	500
Switzerland	1991	736	1993	837
Turkey	n.d.	300	1989	300
United Kingdom	1991	2,956	1993	1,957
United States	1989	197,500	1993	258,000
Total		258,266		323,411

Source: Organization for Economic Cooperation and Development (1994), Table 2, Organization for Economic Cooperation and Development (1997), Table 2.

Note: Figure for Belgium counts all industrial wastes produced in Wallonia only. Only wastes destined for final disposal need to be notified in Britain and Germany. Netherlands' hazardous waste generation includes 845,000 tonnes of contaminated soil. n.d. = no data provided. The differences between waste generation figures for the United States and Europe arise largely because the United States defines large quantities of dilute waste waters as hazardous wastes, whereas in Europe these materials are managed under water protection regulation.

been able to dominate societal interests in the policy process and government agencies have relatively weak enforcement or coordination powers.

Waste disposal facilities across most industrialized countries are becoming increasingly congested, few new ones are being built, and yet few measures are being undertaken by firms or by national regulatory authorities in most countries to enact effective waste-reduction measures at the point of production. These patterns are being repeated across Europe (Hilz & Ehrenfeld, 1991). According to Yakowitz (1993), "all

[OECD] countries are now experiencing difficulties ranging from moderate to extremely severe in trying to site new waste management facilities. New hazardous waste sites are almost impossible to obtain in Western Europe and Japan. Australia is also having great difficulty in this respect" (pp. 137-138). In most industrialized countries, the cost of waste disposal has also vastly increased over the past few years because of more stringent environmental regulations and more advanced disposal technologies. In particular, waste disposal has moved away from landfill methods to more advanced incineration and reprocessing of toxic materials.⁵

Underlying these problems are increased levels of public concern over the siting and operation of waste disposal facilities in all but the poorest communities and areas. Social or public perceptions of the risks posed by hazardous wastes are always high, regardless of the actual environmental risk posed by the waste in question, and it is this degree of (socially perceived, or subjective) risk that provides the basis for many decisions made by both regulators and waste producers and disposal companies, including decisions about waste importation or exportation.⁶ EPA studies within the United States have consistently shown that "public and professional rankings of environmental hazards are markedly divergent" (McKenzie, 1994, p. 92, citing EPA, 1987). As one analysis puts it,

It would appear that, in general, people assess the risks associated with living near a hazardous waste treatment facility as being so great that virtually no reasonable amount of compensation, by itself, can have much impact. Clearly, economic considerations do not seem to play the kind of role we would expect on the basis of the theory of compensation. (Portney, 1988, p. 60)

In turn, such attitudes carry over toward waste importation from abroad, with the added violation of sovereignty that such imports imply. As a result, the management of hazardous wastes—addressing the causes of waste generation and controlling the harmful effects of wastes—has become one of the most highly politicized and contentious environmental issues facing environmental regulators across many countries.

5. One estimate puts the average cost of waste disposal in developed countries at anything between U.S. \$75 and U.S. \$1,500 per ton, depending on the type of waste and the disposal method used or required (Montgomery, 1990, p. 314). According to Hilz and Ehrenfeld (1991), the costs of landfill in the United States increased sixteenfold since the early 1970s, and the cost of incineration increased threefold between 1980 and 1989 (p. 33); trends mirrored across the OECD (O'Neill, 1998).

6. There is a vast literature on the differences between social and expert risk assessments; see, for example, Renn, Burns, Kasperson, Kasperson, and Slovic (1992); Wildavsky and Dake (1990); and Cothorn (1996).

Yet, the problem is more than simply fear of possible long-term consequences of exposure to toxic elements. Some also point to waste management as a good indicator of the extent to which the public trusts the ability of governments to protect them against environmental or, indeed, other misfortunes. For example, one assessment of the failure of the Australian government to set up Australia's first high-temperature incinerator, plans that fell through as a result of societal pressure, ascribed this outcome to more fundamental problems of trust and communication between government actors and affected parties when facing large-scale policy change (McDonell, 1991).

This policy area is also plagued by other forms of regulatory failure. For one, regulatory developments are failing to keep pace with changes in the substances being regulated and with changes in the structure of the waste disposal industry. For example, every year, new substances are being identified that are possibly toxic, yet testing and listing procedures can take many years (Wynne, 1987). At the same time, most regulatory agencies have traditionally sought to govern the upstream, or disposal, end of the waste life cycle, without paying much attention to controlling the actual generation of wastes.

Perhaps more important, most waste regulations in place in industrialized countries were set up in the early 1970s and were designed to regulate an industry made up of many small, local firms. At the time, this was the case. However, in recent years we have seen remarkable changes in the waste management industry, changes that have adversely affected the extent to which any individual government can monitor and/or control the actions of relevant firms. Three stand out: increased privatization, or contracting out of waste disposal services; increased industry concentration; and increased globalization of the major firms (Brusco, Bertossi, & Cottica, 1996; Cooke & Chapple, 1996). In fact, the industry worldwide could be said to be dominated by four or five major players that have predominant stakes in North American and West European waste disposal service provision and that are seeking to expand their role in less developed and emerging economies. In turn, these firms have fundamentally reshaped the regulatory game in ways that are still emerging but are already opening opportunities for transnational regulatory authorities, especially the EU, to play an active role (Brusco et al., 1996).

Cross-national regulatory differences affect the extent to which some countries import and others export hazardous wastes, differences that go well beyond whether a country has a strong or a weak regulatory system.⁷ Take, for example, the cases of Britain and Germany. Britain is one of the world's largest importers of hazardous wastes, and although the government announced a ban on waste importation back in 1991, it

7. See O'Neill (1997) for further discussion.

has yet to implement this policy. Britain is a popular destination for waste exporters because of its reliance on low-technology, and hence low-cost, landfill techniques as its main (or ultimate) disposal method. Germany, on the other hand, is one of the world's largest exporters of wastes. Prior to 1990, most were shipped to East Germany; these days, its wastes tend to go to Britain or to France.

Britain employs a highly decentralized structure of waste management, whereby a largely privatized waste disposal industry is governed by a collection of local waste authorities with minimal guidance from central government, which sees its main function as setting broad policy goals. This process, in turn, although it allows privileged access by the main industrial interests, is closed to environmental groups and, indeed, is immune to public opinion in general.⁸ The German system, although on paper it is similarly decentralized, differs in that waste disposal is under public control: The Länder have developed sophisticated and integrated systems of waste disposal.

Government-business relations in Germany, although close, are far from the comfortable state of affairs in the United Kingdom. For example, industry is subject to a much stricter set of controls than exist in Britain, and, of course, the involvement of the Green Party in German politics (either directly, or as a thorn in the side of the main parties) has opened the policy process up to much more environmental input. Ironically, or perhaps cynically, a case could be made here that although the strength of the Green Movement in Germany has greatly contributed to a cleaner domestic environment (as well as a strong record on transboundary environmental issues within Europe), it has also given the German government an incentive to maintain a pro-exportation policy with respect to wastes: a chance to ameliorate an environmental problem without domestic effects.

In sum, in the British and German cases, as well as in others, differing levels of engagement in the hazardous waste trade can be related to differences between national systems of environmental regulation, which in Britain have given industry much more leeway to engage in waste importation and, in Germany, a strong incentive to export wastes. For those seeking to alter existing trade patterns, the implication is that without focusing on these broader contextual factors, policies are unlikely to succeed. This realization lies behind recent moves toward greater centralization and integration in British environmental policy, and waste minimization on the German side, changes that will be discussed in more depth below and that carry important implications for the waste trade.

8. Tight relationships has developed over time between British bureaucrats and industrial interests, and broader institutional factors, such as Britain's First Past the Post electoral system, have precluded the representation of environmental interests at the national level. See Vogel (1986) for a discussion of the emergence of this relationship.

The emergence of the waste trade can thus be traced to a growing imbalance between the amounts of hazardous waste generated overall and the facilities available to dispose of them properly and to the existence of actors, usually firms, but sometimes also government officials, willing to receive wastes from abroad. In most of the countries I have studied, governments have stated a distinct unwillingness either to receive or to export hazardous wastes. However, enforcing these views, even in the world's advanced industrialized democracies, is another matter, and regulatory authorities in many countries, Britain being just one example, are often ill placed to effectively control the actions of private citizens in this regard. Hence, simply banning the trade without addressing the underlying problems plaguing this issue area is unlikely to be effective. In fact, a ban under these conditions is quite likely to be counterproductive, either driving the trade further underground, tacitly encouraging dumping of more wastes into the global commons, or raising the economic stakes to a point where some less developed countries—as seems to be the case already—break ranks on the waste trade ban.⁹

The Emergence of New Waste Management Strategies in OECD Countries

Framing the waste trade problem in a way that takes into account the national and local dimensions of the disposal crisis generates a different set of policy prescriptions. Several countries appear to be making efforts to address policy reform in this area, with an eye in many cases toward controlling the waste trade in either direction. This section examines some of the major recent policy changes occurring with respect to waste management in Britain, France, Germany, and Australia, policies that will or are projected to have an impact on the waste trade. Governments have adopted specific strategies designed to address the specific problems they face, including the adoption of fiscal measures to change the incentives for choosing certain disposal techniques, the reorganization of waste regulation responsibilities, the development of waste minimization programs, and research into new, and potentially greener, disposal technologies. In all of the cases I have examined, these policy changes are still in their initial stages; hence, an assessment of their effectiveness would be premature. On the other hand, I do try to draw out some preliminary observations, which at least show there is hope

9. The "breaking point" in current Basel Convention activities is over the issue of wastes imported by recycling. Some countries, India being one example, have stated their willingness to import recyclables under certain conditions.

that hazardous waste management is not quite the intractable problem that some view it as being.

Britain and France: Fiscal Incentives and Administrative Reorganization

Britain and France are very similar in lots of ways with respect to their hazardous waste management systems. As well as being large waste importers, both countries have traditionally had extremely decentralized waste management infrastructures, large and privatized disposal industries enjoying a close relationship with government, and have also relied for the most part on landfill as their main disposal route. Both, therefore, are following similar strategies of regulatory reform.

First, they are both experimenting with incentive-based policy instruments to divert wastes away from landfill toward other, more expensive disposal routes. Both countries have recently introduced landfill taxes, in the British case as part of a general package of measures designed to reorganize its regulatory system, and in France as a move toward closing landfill facilities over the next 5 years. These measures have implications for transboundary movements of wastes as, in both countries, landfill is the main disposal route for both their own and imported wastes, in contrast to waste exporting countries, who tend to eschew landfill in favor of more advanced and expensive disposal technologies.

In March 1995, the British chancellor announced a new tax to be imposed on landfill sites—Britain's first Green Tax—which, it is estimated, will raise disposal costs by 50% over the next few years. In its final form, the tax, which came online in October 1996, is levied at £7 per tonne (£2 for relatively inactive wastes); the government estimates that it will raise around £450 million a year in revenue (*ENDS Report* 258, July 1996). It is unclear, however, what the final effect will be on the relative use of landfill compared with incineration. The government dropped initial plans to make the tax ad valorem rather than weight-based; this would have favored cheap, low-quality landfills over the better ones. At the moment, it seems as if firms are more concerned with ensuring their wastes meet the inactive criteria, rather than considering alternative disposal routes. Early reports on the effects of the tax, although they show that the government is likely to reach its revenue targets, say that there is some evidence that wastes are being diverted to illegal disposal routes and that there are few signs as yet that the tax has boosted practices of waste minimization or recycling (*ENDS Report* 265, February 1997).

In France, on the other hand, the landfill tax has as yet been set at levels too low to affect waste disposal routes. Under its Waste Management Strategy of 1992, France plans to ban the use of landfill for waste disposal

by 2002; a tax is seen as an interim measure until then. At least one analyst has criticized this approach for being too rigid, and possibly too expensive, preferring instead the British package, which, although it makes landfill more expensive, retains a degree of flexibility (Litvan, 1995).

One of the main problems outlined above with respect to hazardous waste management in the 1990s is that changes in industry structure and waste management techniques have made regulation of waste disposal at a purely local level undesirable. One reason for this is that local authorities are less able to control waste movements originating or heading toward destinations outside their jurisdiction. Another reason is that they are fairly easy targets for the large waste disposal firms who might seek to import wastes into the region. Again, both Britain and France have had to deal with this problem in recent years. In both cases, waste management and regulation responsibilities had been delegated to a large number of local authorities, which varied immensely in their capabilities to handle wastes. This sort of arrangement, especially at times when center-local relations became strained, in turn generated many coordination and monitoring problems.

Britain, in recognition of these problems, is beginning to shift toward a system of integrated pollution control, whereby powers to regulate the activities of potential polluters not only are centralized under the roof of a single agency but also take into account the cross-media effects of pollution when designing policy approaches.¹⁰ With respect to hazardous wastes, this has meant that regulatory powers, formerly distributed among roughly 200 local authorities, are now to be centralized under the supervision of the new environmental protection agency, set up in April 1996. It has also meant the establishment of stricter inspection policies and the much-anticipated publication of an overall waste management strategy (Department of the Environment, 1995).¹¹ On the whole, these reforms have been welcomed by the waste disposal industry. The lead firms in the industry have, as have other groups with a stake in controlling the waste trade, been highly critical of the slow pace of institutional reform. Many bodies, as well as the industry, have also criticized the lack of reliable data and statistics on waste generation and disposal, arguing for a national classification scheme (*ENDS Report* 265, February 1997, p. 21).

In France, the status of environmental regulation has remained in doubt since the 1982 local government reforms, which introduced a new, regional tier of government. Although in many ways, the regions are ideally placed for taking on pollution control in general, and hazardous waste management in particular, they remain in something of a bind, caught between the centralized and hierarchical Paris ministries and the

10. On integrated pollution control, see Irwin (1990). On recent and proposed policy change in Britain, see Weale (1992a, 1996) and the essays in Gray (1995).

11. See *ENDS Report* 234, July 1994, and *Haznews* Number 104 (November 1996).

departments, who have a much wider social base (Bodiguel & Buller, 1994). In turn, this implies that the ambiguities surrounding waste regulation in France are likely to continue, and France, unlike many of its European counterparts, is lagging in taking steps to address more fundamental environmental policy reform.

Germany: Waste Minimization Policies

As with other OECD nations, issues of hazardous waste management and disposal in Germany have generated a number of problems and a vigorous policy debate in recent years, especially over the extent of legal and illegal waste exportation from Germany, a debate that occurred alongside debates over the recycling of packaging wastes.¹² Three external factors forced the German government to confront the issue of high levels of hazardous waste exportation. First, German unification effectively removed what had been a fairly easy solution to the problem: dumping wastes over the border onto a relatively willing East Germany. Furthermore, unification meant that the Federal Republic now has to bear the costs of cleaning up contaminated sites in the new Länder. The second was the outcry in France in 1992 following the dumping of some dangerous medical wastes, and the subsequent ban that France imposed on most German waste imports. Finally, Germany needed to respond to the increasingly strict line taken on waste exportation by industrialized countries by the EU and the international community.

Within Western Europe, the official German policy is one of self-sufficiency at the national level, although waste trading would still be allowed among the Länder (Pflügner & Götze, 1994). Germany has also entered into a number of cooperative agreements—for example, with France, Belgium, and the Netherlands—to allow waste trading (in both directions). This appears to be, in practice at least, an endorsement of the proximity principle of waste disposal (see Pflügner & Götze, 1994, p. 53). In fact, the German hazardous waste debate has taken on a very different shape from that prevailing in Great Britain or France, where organizational concerns have dominated. National policy in Germany now is aimed at reducing waste production at source or, at the very least, increasing levels of recycling and reuse of wastes in the product cycle. That the Germans have undertaken a vigorous and, according to early data, successful campaign to reduce the generation of hazardous wastes (i.e., regulation at the upstream end of the waste cycle) is entirely consistent with their underlying philosophy of pollution control, based

12. The controversial Packaging Ordinance of 1991 obliged companies (both national firms and importers) to collect any packaging used in the shipping of their products to the point of sale. On this debate in Germany and the European Union, see Vogel (1995) and Quirk (1997).

on rigorous application of the precautionary principle (Jordan & O'Riordan, 1995; Weale, 1992b), and with the strength of their environmental services sector, in which Germany is the world leader (Organization for Economic Cooperation and Development, 1996; Randlesome, 1994).

Recent moves toward a closed-circle economy—the *Kreislaufwirtschaft*—are, therefore, more of a logical extension of existing German environmental policy and practices, as opposed to the more radical change in direction evidenced in the United Kingdom, for example. The main elements of this legislation, first laid out in 1992, and subsequently implemented in late 1996, have important implications for German hazardous waste management.¹³ These include, first, a redefinition of wastes requiring supervision to comply with EU regulations, such that it now includes wastes destined for recycling (previously categorized as economic goods) (see Koss, Malorny, & Stahlke, 1994), and second, a duty imposed on waste-generating firms to seek to reduce waste production and to increase recycling (either via energy production or reuse of wastes as secondary raw materials), as well as imposing strict producer responsibility for all wastes generated (thus extending the Packaging Ordinance to all types of waste). It also tightens up licensing and monitoring processes for waste exportation.¹⁴ Early results of this initiative—for example, through anticipatory action by firms—have been impressive (Czech, 1996).¹⁵ It is expected that the generation of hazardous wastes for final disposal will continue to decline, which should have a corresponding effect on waste exportation, especially if disposal prices fall as a result of spare capacity opening up in the disposal industry.

Thus, in Germany, as in Britain and France, hazardous waste management practices are at a crossroads. Public opposition to the construction of new facilities, along with heightened international awareness of, and opposition to, Germany's waste exportation practices, have in the last few years led to an even more rigorous approach to waste regulation, via the implementation of the *Kreislaufwirtschaft* ("Closed-Circle Economy") Ordinance, which has shifted the regulatory focus onto the actual generators of wastes, as opposed to the waste disposal sector.

What the future holds is yet another matter. Certain trends—for example, a decline in capacity utilization, plus the growing role of the private sector in waste management—point toward a possible growth in demand on the part of the waste industry to allow importation, trends

13. For a full discussion of the measures contained within the *Kreislaufwirtschaft* in its final version, see Stede (1996) and "New German Waste Law" (1996). The law is expected to be in full force by January 1, 1999.

14. As reported by the Associated Press, October 6, 1996, and *BNA International Environment Reporter*, August 21, 1996.

15. According to this report, waste arisings began to decline in 1992 or 1993. Czech (1996) cites the federal government publication, *Umwelt*, as reporting in September 1995, that based on declining waste volumes in 1992-1994, the Federal Environment Office predicts up to a 50% decline in waste generation in the years to come.

that would be strengthened should the EU waste regime move toward allowing wastes to be exported to countries with the best facilities. On the other hand, this looks unlikely, especially given the powerful influence that societal actors wield over the policy process, as well as the risk-averse tendencies exerted by the application of the Precautionary Principle as a basic tenet of German environmental regulatory philosophy.

Australia: Research Into New Disposal Techniques

The Australian experience with hazardous waste management and trade tells a slightly different story. Australia, at least until recent years, exported hazardous wastes because it lacked the sorts of facilities, notably high-temperature incinerators, to dispose of these wastes in a proper manner (McDonell, 1991). Such wastes, therefore, have been shipped to the United Kingdom and to France.¹⁶ Remaining intractable wastes have been stored in facilities in and around Sydney, the capital of Australia's most heavily industrialized state, New South Wales.¹⁷ Other hazardous, but nonintractable, wastes have either been sent to landfill, dumped, or incinerated on the oceans (Lipman, 1990, p. 288).

During the late 1980s and early 1990s, a commission appointed by the commonwealth, or federal, government located and attempted to begin construction of what was intended to be a national waste incinerator on a site close to the border between Australia's two most industrialized states, New South Wales and Victoria. However, extremely high levels of public protest followed, and as a result, the project was halted (McDonell, 1991). In the years following, waste exportation and stockpiling has continued, as have attempts to find alternative solutions to a problem becoming ever more pressing as the ban on waste exportation to non-OECD countries gets ever closer. These alternatives include trying to locate another site, developing a network of facilities, drawing up waste minimization and recycling policies, and examining alternative strategies of waste management (Beder, 1991), efforts that are more evident in Australia than in the other countries discussed here, although for the most part these efforts have not gone much beyond the research and testing stages.

Some of the new techniques for the disposal of intractable wastes either in operation or being developed in Australia include a hydrogena-

16. Australia also exports some wastes destined for recycling to destinations in South East Asia; these practices will be banned under the Basel Convention as of 1998.

17. As of 1991, 11,000 tonnes of intractable wastes were being stored in New South Wales. Although the bulk of it originated locally, some 15% had been imported—probably from the other states, although this is not clear. Adding other sorts of hazardous wastes would increase this stockpile at a rate of 12,000 tonnes per year. It was also estimated that roughly 10,000 tonnes of halocarbons and CFCs will be discarded over the following 10 years. See Beder (1991).

tion process called *Ecologic*, which converts hazardous substances to methane, most of which is then converted to hydrogen—whereas this process is costly, a relocatable plant capable of processing small amounts of wastes is currently operating in Perth (Western Australia); bioremediation, which involves the use of micro-organisms (such as white-rot fungi) to break down toxic compounds—so far this process is still in the testing stage, though it would promise, if successful, to be the cheapest and safest alternative—and Base Catalyzed Dechlorination (BCD), another potentially portable disposal system currently being used in Queensland and running into some technical difficulties in Victoria at the time of this writing.¹⁸

Australia will have problems as it reduces its reliance on hazardous waste exportation over the long term. The government did announce a 2-year moratorium on such exports in 1992 despite the lack of domestic alternatives. This moratorium was extended into a permanent ban on waste exportation, except in exceptional circumstances, in December 1996. No provisions have been made for allowing waste imports. However, a conclusion reached in 1990 still seems to be true today: "Australia has achieved a great deal in the last few years but overall, has not kept pace with the rest of the industrialized world in developing regulatory arrangements, institutions and facilities for waste management" (Lipman, 1990, p. 291).

Discussion: Lessons Learned and the Increased Scope for International Action

A variety of points may be drawn from the above. First, as should be apparent, these reforms are, in all of the above cases, only now being fully introduced. As with most large policy changes, they have experienced delays and glitches, and it will be some time before their effect on waste trade and on hazardous waste management procedures in these countries will become measurable. However, they do demonstrate that, contrary to some popular belief, there has been a concerted effort on the part of regulatory agencies to address some of the many problems that have emerged in the hazardous waste management sector over the last few decades and that these problems are not necessarily as intractable as they might have first appeared to be.

Second, I have in each case picked out the most prominent features of the policy reform. While it might appear that these could be country specific, the policy directions being taken by Britain, Germany, and Australia share certain broad features and can be applied to other

18. Information from a review report prepared for the Australian EPA by CMPS&F Environmental, November 1995 (available on Environet Australia at <http://www.environment.gov.au/portfolio/ega/environet/swtt/summary.html>); accessed April 1997.

national situations. They differ not along national-specific lines, but primarily in terms of their goals: whether they aim to manage existing waste streams or whether they seek to minimize wastes being generated at the domestic level. The British version of integrated pollution control, for example, is fairly narrow in its conceptualization, developed to control the emission of pollutants from specific industrial approaches across different media, in contrast with a broader formulation of the concept, which also emphasizes the need to practice resource conservation. Thus, as some have pointed out, British policy, as it stands, has no necessary waste minimization component, although this is open to interpretation (Emmott & Macrory, 1995).

These strategies, on the other hand, share a much more sophisticated understanding of the linkages between waste trade practices, waste management issues, other environmental issues, and even economic concerns than had been evident in early waste policy measures. In each country as well, there is evidence of a more planned and programmatic approach to waste management. Organizational concerns (regulatory structure), technical solutions, and economic opportunities are all to the fore, as is an emphasis on private sector activity and innovation. These reforms can themselves be understood in the context of ecological modernization or the new politics of pollution (Weale, 1992a), whereby environmental policy elites across industrialized countries are beginning to take into account the positive relationship that can exist between environmental protection and economic activity, as well as incorporating a more holistic view of the environment as a field of action. This shift in perception can, indeed, be related to the shift in the way the hazardous waste trade should be framed as a policy problem advocated by this article.

One of the advantages of these approaches is that they have a high degree of cross-national applicability. That is not to say that, for example, every waste management system should be fully centralized, or integrated, but that organizational concerns should be given an important place in policy design. Much of the technology—either for use within the production process or for waste disposal—is portable, and high potential profits await companies willing to step into new markets with this equipment. Their disadvantage is that they do not directly address the issue of citizen participation and the need to (re)build the bonds of trust between regulatory officials and the public; they might instead be better described as technical fixes. Britain's much-vaunted reforms, for example, do little to address the ways in which public opinion and environment groups are excluded from the policy process, except to the extent that individual governments might choose to bring them in.

These points raise some issues that are beyond the scope of this essay. They do, however, raise the issue of what, if any, role the international community has to play in controlling the hazardous waste trade, if the

answer really does lie in the way individual countries manage their own wastes. Brian Wynne, in 1987, asked a similar question, claiming that an international waste trade regime should be built up from the basis of national differences and take into account the fact that these differences may be irreconcilable: "The technical harmonization and consistency of local costs and implementation practices needed for regulation at the international level is intrinsically limited by national institutional factors" (Wynne, 1987, p. 35). Thus, "effective *international* regulatory regimes" should be based on a bottom-up understanding of "how characteristic *national* or *regional* institutional factors influence the definition, meanings and diverse uses of what is in theory the *universal* resource of scientific knowledge and technical methods for regulation" (pp. 30-31).¹⁹ His point remains valid today and is a useful counterpoint to what has become almost a knee-jerk reaction in this field: Cooperate first and ask questions later. At the same time, an argument against international intervention in hazardous waste management based on the sovereign origins and manifestations of the problem ignores the need for shared understandings (e.g., in terms of waste definitions or possible prescriptions for action) if a problem common to many states is to be solved without unnecessary transactions costs or duplication of activity.

Over the last 10 years or so, international organizations, such as the UNEP and the EU, have greatly expanded the scope of their activities, as well as their capacity to undertake activities that would have been seen, just a few years ago, as intolerable violations of national sovereignty.²⁰ Concomitantly, although banning the waste trade from rich to poorer nations is an extremely well-intentioned idea, and one with which no one would (publicly) disagree, the above argument makes it clear that international organizations need to expand the scope of their activities if such a ban is to meet with success.

For instance, industrialized countries need to make and be held to commitments to take decisive action to minimize waste generation and

19. In fact, his argument, as set out as the task for the volume, is even stronger: "Given the pressure on underdeveloped international frameworks caused by local inadequacies, we decided it was necessary first to see whether comprehensive local approaches could not adequately handle the problems" (Wynne, 1987, p. 30).

20. In some ways, the European Union (EU) is better suited in terms of jurisdictional capabilities to control waste trading within its borders and from its member states to non-EU countries. Its own debates on the subject have shown a marked progression from trying to treat wastes as normal goods for the purpose of trade to its present position that favors the application of the self-sufficiency principle (as opposed to the proximity principle) among member states. Recent directives from Brussels and European Court of Justice rulings have shown an understanding of the linkages between waste generation and waste trading. However, as is not unusual in European affairs, action lags well behind intention, as the member states have to date failed to implement even a common definition or listing of substances considered to be hazardous wastes. On these debates, see Jupille (1996) and Zito (1994).

to manage more effectively the wastes generated by their industries. As many studies have shown, international organizations and regimes can play a pivotal role in doing this, through information exchange, reputational effects, and in some cases financial aid: all mechanisms that rely not on coercion but on persuasion for their effects (see Haas, Keohane, & Levy, 1993; Keohane & Levy, 1996; Mitchell, 1994). As the above discussion shows, reforms in each of the countries have suffered some setbacks and are proceeding slowly. International coordination (and, indeed, encouragement) could help overcome some of these problems.

There are also signs that the waste disposal crisis afflicting industrialized countries is also afflicting their less industrialized counterparts. Information on hazardous waste generation and management in non-OECD countries remains scarce. However, trends are becoming apparent that suggest that the above problems are by no means confined to industrialized nations. The British-based trade journal *Haznews* prints regular overviews of recent developments in developing waste markets. Trends vary internationally; the Russian Federation, for example, has witnessed a decrease in amounts of hazardous wastes reported but is facing a disposal crisis, especially in dealing with the billions of tonnes of wastes still stockpiled. Middle Eastern countries together produce roughly over 1 million tonnes of hazardous wastes per year; outside of Saudi Arabia, facilities are minimal if they exist at all. In South East Asia, Malaysia, for example, has doubled hazardous waste volumes between 1984 and 1994. The situation in English-speaking Africa is possibly worse; the International Maritime Organization estimates that about 2.23 million tonnes of hazardous wastes are generated in these countries, over half of which is produced by South Africa. They go on to report that "the wastes are mainly (with the partial exception of South Africa) discharged to sewers, sent to municipal landfill or dumped on open land. Of the countries surveyed, South Africa, Namibia and Mauritius appear to be the only countries with commercial hazardous waste disposal facilities"; yet, in the figures quoted, Nigeria, Ethiopia, Kenya, and Zimbabwe lie directly behind South Africa in terms of waste generation ("Africa Study Reveals," p. 17; see also "Chemcontrol Symposium II," 1996).

According to a report in *The New York Times Magazine*, "in China, an estimated 25 billion tons of unfiltered industrial pollutants went directly into the waterways in 1991, which means there was more toxic pollution in that one country than in the whole of the Western world" (Easterbrook, 1994, p. 61).

Extensive international activity is already under way to help less industrialized countries develop effective waste management infrastructures. It is to be hoped in the course of this activity that attention is paid to some of the mistakes made by their more industrialized counterparts and that some of the reforms outlined above are taken into account

in policy design. The World Bank, the United States Agency for International Development (USAID), and the UNEP are all engaged in such effects, as are the larger international waste disposal companies, such as Waste Management International, Générale des Eaux, and the Danish firm KommuneKemi. In fact, one of the big questions in the future for managing the waste trade, especially in terms of its north-south aspects, will be what mix of public and private sector activity will emerge in this area. Resolving the hazardous waste management crisis afflicting most countries involves a strong element of public or collective goods provision: research and development expenditures on disposal and production technologies, the dissemination of relevant information, and education and training programs. At the moment, private firms appear to be taking the initiative in developing and implementing new waste disposal technologies; however, their increasingly multinational scope has undermined the ability of individual governments to regulate their activities. The governing bodies of the EU have, however, been able to step in here, and they have been able to take advantage of industry developments to enact more stringent regulations regarding waste management in the EU, at the same time becoming one of the major focal points of firms' lobbying activities.²¹

Finally, the extent to which individual governments, with or without help from the international community, can overcome the societal constraints on constructing new waste disposal facilities, especially those involving sophisticated treatment and recovery processes, will have a big impact, not only on the waste trade but also on environmental politics in general. A possible solution to the waste trade problem, and an economically feasible alternative to a blanket ban, would be to construct large-scale, integrated waste management facilities in certain countries that could be used to process the most toxic wastes from other countries as well. The problem of citizen participation in, and hence the legitimacy of, waste management decisions in individual countries has already been discussed. Although in most of these cases, especially those in which societal interests are excluded from the policy process, these patterns of interaction are long embedded in historical practice, the international policy arena does, however, represent an increasingly open space where representatives of nonstate actors at the subnational level have been able to play an active role in decision making (Litfin, 1993). Although the possibility of a viable and socially acceptable waste management scheme emerging from an open international forum is low, as previous experience with such fore has shown, cross-national information exchange at this level among the many different groups with a stake

21. The dimensions of these interactions between European waste disposal firms, governments, and the European Union are discussed in more depth in Brusco, Bertossi, and Cottica (1996).

in controlling the waste trade cannot but help international and national authorities effectively address one of the most important and politically controversial environmental issues of our times.

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References

- Africa study reveals state of hazwaste management. (1997, April). *Haznews*, 109, 17.
- Beder, S. (1991, June 8). The burning issue of Australia's toxic waste. *New Scientist*, 130(1772), 35-38.
- Bodiguel, M., & Buller, H. (1994). Environmental policy and the regions in France. *Regional Politics and Policy*, 4(3), 92-109.
- Brusco, S., Bertossi, P., & Cottica, A. (1996). Playing on two chessboards—the European waste management industry: Strategic behavior in the market and the policy debate. In F. L  veque (Ed.), *Environmental policy in Europe* (pp. 113-142). Cheltenham, UK: Edward Elgar.
- Bryant, B., & Mohai, P. (1992). *Race and the incidence of environmental hazards: A time for discourse*. Boulder, CO: Westview.
- Bullard, R. (1991). *Dumping in Dixie: Race, class and environmental quality*. Boulder, CO: Westview.
- Chemcontrol Symposium II: Developing markets. (1996, November). *Haznews*, 104, 22-24.
- Clapp, J. (1994). Africa, NGOs, and the international toxic waste trade. *Journal of Environment and Development*, 3(2), 17-46.
- Cooke, A., & Chapple, W. (1996). EU regulation and the UK waste disposal industry. *Environmental Policy and Practice*, 6(1), 11-16.
- Copeland, B. (1991). International trade in waste products in the presence of illegal disposal. *Journal of Environmental Economics and Management*, 20, 143-162.
- Cothern, C. R. (1996). *Handbook for environmental risk decision making: Values, perceptions and ethics*. Boca Raton, FL: Lewis.
- Crooks, H. (1993). *Giants of garbage: The rise of the global waste industry and the politics of pollution control*. Toronto: James Lorimer.
- Cubel-S  nchez, P. (1997). Transboundary movements of hazardous wastes in international law: The special case of the Mediterranean area. *International Journal of Coastal and Marine Law*, 12(4), 447-487.
- Czech, H. (1996, August). *Classification and underground disposal of hazardous wastes in Germany*. Paper presented at the GTDC Workshop, Vienna, Austria.
- Department of the Environment. (1995). *Waste management planning: Principles and practice*. London: Her Majesty's Stationery Office.
- Dowling, M., & Linnerooth, J. (1987). The listing and classifying of hazardous wastes. In B. Wynne (Ed.), *Risk management and hazardous waste: Implementation and the dialectics of credibility* (pp. 114-149). Berlin: Springer-Verlag.

- Downie, D. (1994, September). *Road map or dead-end: Is the Montreal Protocol a precedent for global climate change negotiations?* Paper presented at the annual meeting of the American Political Science Association, New York.
- Easterbrook, G. (1994, September 11). Forget PCB's. Radon. Alar. *The New York Times Magazine*, pp. 60-63.
- Emmott, N., & Macrory, R. (1995). The contribution of IPC to waste minimization. *Environmental Policy and Practice*, 5(3), 145-147.
- Environmental Data Service (London). (1996-1997). *ENDS Report*, various issues.
- Environmental Protection Agency. (1987). *Unfinished business: A comparative assessment of environmental problems*. Washington, DC: Author.
- Forester, W. S., & Skinner, J. H. (Eds.). (1987). *International perspectives on hazardous waste management*. London: Academic Press.
- Gray, T. S. (Ed.). (1995). *UK environmental policy in the 1990s*. London: Macmillan.
- Haas, P. M., Keohane, R. O., & Levy, M. A. (Eds.). (1993). *Institutions for the earth: Sources of effective international environmental protection*. Cambridge, MA: MIT Press.
- Heller, P. (1994). *Database of known hazardous waste exports from OECD to non-OECD countries. 1989-March 1994*. Washington, DC: Greenpeace.
- Helm, D., & Pearce, D. (1990). Economic policy towards the environment. *Oxford Review of Economic Policy*, 7(4), 1-16.
- Hilz, C., & Ehrenfeld, J. R. (1991). Transboundary movements of hazardous wastes: A comparative analysis of policy options to control the international waste trade. *International Environmental Affairs*, 3(1), 26-63.
- Hyman, M. (1997, July). *Australian hazardous waste legislation and our international obligations*. Paper presented at the Infrastructure 1997 Conference, Sydney, Australia.
- Irwin, F. (1990). Introduction to integrated pollution control. In N. Haigh & F. Irwin (Eds.), *Integrated pollution control in Europe and North America* (pp. 3-30). Washington, DC: The Conservation Foundation.
- Jordan, A., & O'Riordan, T. (1995). The precautionary principle in UK environmental policy. In T. S. Gray (Ed.), *UK environmental policy in the 1990s* (pp. 57-84). London: Macmillan.
- Jupille, J. H. (1996, April). *Free movement of goods and hazardous waste: Reconciling the single market with environmental imperatives*. Paper presented at the annual meeting of the International Studies Association, San Diego, CA.
- Keohane, R. O., & Levy, M. (Eds.). (1996). *Institutions for environmental aid: Pitfalls and promise*. Cambridge, MA: MIT Press.
- Koss, K-D., Malorny, U., & Stahlke, W. (1994). Europaischer Abfallkatalog und die EGAbfallverbringungs-Verordnung [The European waste list and the EU waste trade ordinance]. *Mull und Abfall*, 10, 625-640.
- Lipman, Z. (1990). The convention on the control of transboundary movements and disposal of hazardous wastes and Australia's waste management strategy. *Environmental and Planning Law Journal*, 7(4), 283-293.
- Litfin, K. (1993). Eco-regimes: Playing tug of war with the nation-state. In R. Lipschutz & K. Conca (Eds.), *The state and social power in global environmental politics* (pp. 94-118). New York: Columbia University Press.
- Litvan, D. (1995). Politique des déchets: l'approche du Royaume-Uni [Waste management policy: The approach of the United Kingdom]. *Economic et Statistique*, 290(10), 81-90.
- McDonnell, G. (1991). Toxic waste management in Australia: Why did policy reform fail? *Environment*, 30(8), 10-13, 33-39.
- McKenzie, F. (1994). Policy formulation for the management of hazardous wastes. *Journal of Environmental Planning and Management*, 37(1), 87-106.
- Mitchell, R. B. (1994). *Intentional oil pollution at sea: Environmental policy and treaty compliance*. Cambridge, MA: MIT Press.
- Montgomery, M. A. (1990). Traveling toxic trash: An analysis of the 1989 Basel Convention. *The Fletcher Forum of World Affairs*, 14(2), 313-326.

- Montgomery, M. A. (1994, September). *Politics and sustainable development: Guinea-Bissau and hazardous waste imports*. Paper presented at the annual meeting of the American Political Science Association, New York.
- Montgomery, M. A. (1995). Reassessing the waste trade crisis: What do we really know? *Journal of Environment and Development*, 4(1), 1-28.
- New German waste law in force. (1996, November). *Haznews*, 104, 12.
- Newman, P. (1994). Killing legally with toxic wastes: Women and the environment in the United States. In V. Shiva (Ed.), *Close to home: Women reconnect ecology, health and development worldwide* (pp. 43-59). Philadelphia: New Society.
- O'Neill, K. (1997). Regulations as arbiters of risk: Britain, Germany and the trade in hazardous wastes in Europe. *International Studies Quarterly*, 41(4), 687-718.
- O'Neill, K. (1998). *International and domestic environmental regulation: The international trade in hazardous wastes among OECD countries*. Unpublished doctoral dissertation, Columbia University, New York.
- Organization for Economic Cooperation and Development. (1993). *Monitoring and control of transfrontier movements of hazardous wastes*. Paris: Author.
- Organization for Economic Cooperation and Development. (1994). *Transfrontier movements of hazardous wastes. 1991 statistics*. Paris: Author.
- Organization for Economic Cooperation and Development. (1996). *Environmental performance in OECD countries: Progress in the 1990s*. Paris: Author.
- Organization for Economic Cooperation and Development. (1997). *Transfrontier movements of hazardous wastes: 1992-93 statistics*. Paris: Author.
- Pflügener, W., & Götze, M. (1994). *Shipments of waste within, into and out of the European Community with a view to the application of the proximity and the self-sufficiency principles concerning the disposal of waste*. Unpublished report, Commission of the European Community, DO XI, Brussels.
- Porter, G., & Brown, J. W. (1995). *Global environmental politics* (2nd ed.). Boulder, CO: Westview.
- Portney, K. (1988). The role of economic factors in lay perceptions of risk. In C. E. Davis & J. P. Lester (Eds.), *Dimensions of hazardous waste politics and policy* (pp. 53-62). New York: Greenwood.
- Puckett, J. (1992). Dumping on our world neighbours. In H. O. Bergesen, M. Norderhaug, & G. Parmann (Eds.), *Green globe yearbook 1992* (pp. 93-106). Oxford: Oxford University Press.
- Quirk, N. (1997, May). *Environment and the single market: The EU's packaging waste directive*. Paper presented at the biennial conference of the European Community Studies Association, Seattle, WA.
- Randlesome, C. (1994). *Business culture in Germany: Portrait of a powerhouse*. Oxford, MA: Butterworth-Heinemann.
- Renn, O., Burns, W. J., Kasperson, J. X., Kasperson, R. E., & Slovic, P. (1992). The social amplification of risk: Theoretical foundations and empirical applications. *Journal of Social Issues*, 48(4), 137-160.
- Singh, J. B., & Lakahan, V. C. (1989). Business ethics and the international trade in hazardous wastes. *Journal of Business Ethics*, 8, 889-899.
- Stede, B. (1996). Abfall in der Kreislaufwirtschaft [Waste in the closed circle economy]. *Müll und Abfall*, 3, 141-152.
- Strohm, L. (1993). The environmental politics of the international waste trade. *Journal of Environment and Development*, 2(2), 129-153.
- Third World Network. (1989). *Toxic terror: The dumping of hazardous wastes in the third world*. Penang: Author.
- Turner, B. L., Kasperson, R. E., & Meyer, W. B. (1990, December). Two types of global environmental change: Definitional and spatial-scale issues in their human dimensions. *Global Environmental Change*, pp. 14-22.

- Vallette, J., & Spalding, H. (1990). *The international trade in hazardous wastes: A Greenpeace inventory* (5th ed.). Washington, DC: Greenpeace International Waste Trade Project.
- Vogel, D. (1986). *National styles of regulation: Environmental policy in Great Britain and the United States*. Ithaca, NY: Cornell University Press.
- Vogel, D. (1995). *Trading up: Consumer and environmental regulation in a global economy*. Cambridge, MA: Harvard University Press.
- Weale, A. (1992a). *The new politics of pollution*. Manchester, UK: Manchester University Press.
- Weale, A. (1992b). Vorsprung durch Technik? The Politics of German Environmental Regulation. In K. Dyson (Ed.), *The politics of German regulation* (pp. 159-183). Aldershot, UK: Dartmouth.
- Weale, A. (1996). Environmental regulation and administrative reform in Britain. In G. Majone (Ed.), *Regulating Europe* (pp. 106-130). London: Routledge.
- Wildavsky, A., & Dake, K. (1990). Theories of risk perception: Who fears what and why? *Daedalus*, 119(4), 41-60.
- Wynne, B. (1987). *Risk management and hazardous waste: Implementation and the dialectics of credibility*. Berlin: Springer-Verlag.
- Wynne, B. (1989). The toxic waste trade: International regulatory issues and options. *Third World Quarterly*, 11(3), 120-146.
- Yakowitz, H. (1993). Waste management: What now? What next? An overview of policies and practices in the OECD area. *Resources, Conservation and Recycling*, 8, 131-178.
- Young, O. R. (1994). *International governance: Protecting the environment in a stateless society*. Ithaca, NY: Cornell University Press.
- Zito, A. R. (1994, September). *The role of technical expertise and institutional innovation in European hazardous waste policy*. Paper presented at the annual meeting of the American Political Science Association, New York.

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