A Review of Integrated Pollution Control Efforts in Selected Countries

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Abstract

This report describes the reasons why integrated pollution control (IPC) became accepted as a necessary part of the environmental regulatory systems of the Netherlands, the United Kingdom, and Sweden and examines the experience these countries have had with unified environmental statutes, alternative compliance approaches, cross-media permitting, and other aspects of IPC that are under consideration in this country. The report is organized into five sections. In the first section we provide a brief overview of the intellectual pedigree of integrated pollution control, and discuss arguments that have been put forward by advocates of IPC as well as the counter-arguments of those who have taken a more skeptical view of the technical and political feasibility of implementing IPC measures. Section two details how the United Kingdom, long considered the dirty man of Europe, is developing an integrated system of industrial pollution control based on its 1990 Environmental Protection Act. The Act introduced new controls to limit and prevent pollution from a wide range of industries and has created a unified pollution inspectorate to ensure that the best practical environmental option (BPEO) for all media is achieved. We consider both the progress the UK Environmental Agency has made in IPC as well as the barriers it has encountered. In section three, we examine how the Dutch Environmental Ministry (VROM) was able to forge a consensus among diverse groups for the need to embrace innovative, integrated policies and then examine in detail the Dutch experience with alternative compliance efforts, notably their covenant system. The long-standing success of Sweden's industrial permitting system is analyzed in section 4 and in the fifth and final section we consider the development and implications of the European Union's recently adopted Directive on Integrated Pollution Prevention and Control, a document which is likely to have a profound influence on environmental management in Europe and elsewhere.

Key Words: integrated pollution control, European environmental policy, environmental compliance and enforcement

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INTRODUCTION

While environmental policy makers in this country have long deliberated what integrated pollution control (IPC) is, what advantages it might offer, and how it could be fostered, environmental ministries in other countries have, for more than a decade, taken practical steps to implement a wide range of integrated pollution control measures. This paper will describe the reasons why IPC became accepted as a necessary part of the environmental regulatory system of the Netherlands, the United Kingdom, and Sweden, and, more importantly, analyze the experiences of these countries with unified environmental statutes, alternative compliance approaches, cross-media permitting, and other aspects of IPC that are under consideration in this country. The report will also consider the development and implications of the European Union's recently adopted Directive on Integrated Pollution Prevention and Control, a document which is likely to have a profound influence on environmental management in Europe and elsewhere.

It could be argued, of course, that these IPC initiatives have emerged from specific political and regulatory traditions and thus whatever lessons we can distill from studying these countries' reforms may have little applicability to the American regulatory context. Undoubtedly, comparisons of environmental policies among countries are fraught with difficulties. There are important differences in the role of the legislature in drafting environmental statutes, in the degree of public participation in regulatory decision making, in the public's trust of government institutions, and in the relation of the regulatory community to business and labor unions. These differences must be acknowledged but should not obscure what may well be more basic commonalities. For the United States and the other countries discussed in this report, environmental protection is increasingly seen as a precondition for sustainable development rather than a zero-sum trade-off between economic prosperity and the environment. The role of government is no longer limited to devising command and control measures but involves providing appropriate incentives for industries and consumers to spur environmental quality improvements. The increased public understanding of the scale and persistence of pollution problems--such as climate change, ozone depletion, and nitrate pollution--has posed challenges to the institutions and administrative processes that each country has established to handle environmental problems. In broad terms many of the assumptions that have guided environmental policy in this country during the last two decades

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are unraveling, and though the shape of future reforms is not clear, it is likely that new environmental policies in the United States will incorporate many of the innovative policies that have become part of environmental management in Britain, the Netherlands, and Sweden. In the 1970s a host of countries modeled their environmental ministries on the single media divisions that characterized the EPA. Twenty-five years later, a number of these countries have discarded this framework; it is perhaps time we learn from them.

Structure of the Report

This report is organized into five sections. In the first section, we provide a brief overview of the intellectual pedigree of integrated pollution control and discuss arguments that have been put forward by advocates of IPC as well as the counter-arguments of those who have taken a more skeptical view of the technical and political feasibility of implementing IPC measures. After having laid this groundwork, we examine, in the following three sections, how the United Kingdom, the Netherlands and Sweden have made the concept of IPC a workable reality. In each of these sections we will first examine the structural reorganizations that took place within the respective governments to facilitate integration of environmental management. We will consider how the major environmental laws of each country were unified, the government agencies involved in pollution control, the objectives of IPC in each country, the focus of activities (e.g., facility, substance, geographic area) and the level of government(s) involved. With the American context firmly in mind, we will then describe where integration has made the most impact as well as the barriers that impede further integration in these countries. In each section, we will also look closely at the functions that each environmental agency has attempted to integrate such as permitting, enforcement, voluntary compliance, and information provision. Where the evidence is sufficiently robust we will attempt to evaluate both the principles (e.g., BPEO) and procedures (e.g., covenants) that comprise integrated pollution control as it is currently practiced in each of these countries. The fifth and final section will place these IPC efforts in the larger context of the European Union's recently adopted Directive on Integrated Pollution Prevention and Control.

Caveats

As a final introductory note, two caveats are in order. First, in an ideal world where scarcity does not constrain research, we would have been able to visit each country and discuss the implementation and effect of IPC with a wide range of stakeholders, including government officials, NGOs, industry representatives, citizens groups, etc. Due to time and resource constraints, we were limited to telephone interviews (see Appendix 1 for a list of contacts) and relied on the researcher's art of ferreting out documents, articles, and unpublished materials that could fill in the gaps in our understanding. Second, and perhaps more important, integrated pollution control, though long advocated, is still rather undeveloped as a practical approach to environmental management. There has been very little written to evaluate IPC initiatives up to

this point either by government agencies, NGOs or industry representatives and there is limited data available from which one can draw inferences. For example, it is not known with any degree of certainty if integrated permitting reduces compliance costs to regulated firms. It is difficult to ascertain the extent to which IPC initiatives on their own have led to improved environmental quality. Many of the definitions for key terms like "best practical environmental option" (BPEO), the cornerstone of IPC in the UK, are still quite malleable and are being refined through regulatory experience. While we are not far enough down the road to systematically assess the impacts of IPC in any single country, it is possible, and indeed necessary, to interrogate the evidence that exists in order to gain a clearer picture of the possibilities that an integrated approach to environmental management may offer and to discern more clearly the scope of integration that has been undertaken.

AN OVERVIEW OF INTEGRATED POLLUTION CONTROL

For more than two decades, a strong case has been made in this country and abroad for creating more flexible and integrated environmental protection strategies. The recent recommendation of the National Academy of Public Administration (NAPA) report, calling for a "break down of the internal walls between the agency's [EPA] major media program offices for air, water, waste, and toxic substances," is part of a long and well-documented lineage.[1] As early as 1970, in announcing the formation of the EPA, President Nixon emphasized that environmental protection must be based on a deep awareness of natural processes across all media:

> "Despite its complexity for pollution control purposes the environment must be perceived as a single interrelated system. Many agency missions, for examples are designed primarily along media lines--air, water and land. Yet the sources of air, water and land pollution are inter-related and often interchangeable."[2]

These were not merely the sentiments of one presidential speechwriter. The need to fashion environmental laws and to develop institutions capable of dealing with cross media pollution was also recognized by other governments and international organizations. In Britain the report of the Royal Commission on Environmental Pollution (1976) found many cases where the control of emissions to an individual environmental medium led to greater problems in other areas and suggested that polluting releases should be directed to the environmental medium where the least environmental damage would be done (e.g., the best practicable environmental option (BPEO). The report called for a unified pollution control inspectorate to ensure that the BPEO was adopted for the most polluting industrial processes.

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[1] National Academy of Public Administration. 1995. *Setting Priorities, Getting Results*, p.4.

[2] Quoted in Terry Davies, "The United States: Experiment and Fragmentation" in N. Haigh and F. Irwin, eds., *Integrated Pollution Control in Europe and North America*, London: IEEP, 1990.

In Holland, by the mid-1980s, the single medium approach to environmental protection was widely seen to be a failure.[3] In response to studies indicating widespread nitrate pollution from agriculture and extensive soil contamination from chemical wastes, the Dutch environmental ministry adopted a cross-media approach which focused not on particular receiving media but on sources of pollution (e.g., industry, farming, transportation) and classified environmental problems into eight "themes" (e.g., climate change, acidification, eutrophication, waste disposal, dispersion, local nuisance, water depletion, and resource management) that crossed both territorial and institutional boundaries.

The Dutch systems approach to environmental protection influenced the OECD Council Recommendation on "Integrated Pollution Prevention and Control" (1991), a document in which the concept of integrated pollution control (IPC) is perhaps given its broadest definition. It calls on member countries

> "to practice integrated pollution prevention and control, taking into account the effects of activities and substances on the environment as a whole, and the whole commercial and environmental life cycles of substances when assessing the risks they pose and when developing and implementing controls to limit their release."[4]

Such an approach would not be limited to industrial emissions, but would address inputs to industry and agriculture, consider products as sources of pollution and trace releases throughout their life cycle, from resource extraction to their ultimate disposal, and examine the fate and transport of pollutants in the environment. The organization of an environmental protection agency, in this view, would be based on the recognition that pollutants in the natural world move across media, rather than stopping conveniently at the boundaries of air, water, land, and waste programs.

More recent calls for integrated pollution control argue from the same premise.[5] For advocates of IPC, the single media based approach to environmental protection is unable to view the environment in a holistic manner, but operates rather in a piecemeal fashion, constrained by competing environmental statutes, inconsistent regulations, and bureaucratic turf wars. Irwin and Davies have argued that, in contrast to EPA's media specific framework, a more integrated approach to the environment would be beneficial for a number of reasons:

1. Many existing, complex pollution problems can only be resolved through an integrated approach. For example, in the Great Lakes, the major part of toxic pollution comes from air deposition, sediment, and run-off. Unless a more integrated approach is followed,

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[3] Ministry of Housing, Spatial Planning and the Environment. 1994. *Towards a Sustainable Netherlands*, p. 5.

[4] OECD. 1991. *Integrated pollution Prevention and Control*, Monograph No. 37.

[5] See unpublished papers (on file with author) from Integrated Environmental Legislation conference, June 3, 1996, Washington DC, sponsored by the Center for Risk Management, Resources for the Future.

single media programs may well shift the pollution from one media to another or fail to delineate the scope of the problem.

2. The current fragmented approach makes it less likely that more complex environmental problems will be identified. Problems like ozone depletion and acid rain were not anticipated or accurately identified because, in large part, they did not fit neatly into any regulatory program.
3. The number of environmental laws, each with its own process of legislation, revision, regulation and enforcement has made it difficult to set overall environmental priorities based on risk or some other common scale.
4. The technological standards specified in the existing statutes--BACT (Best Available Technology), MACT (Maximum Achievable Control Technology), LAER (Lowest Achievable Emissions Rate)--are designed to meet the requirements of single media-based regulations. These highly specific regulatory requirements have in many cases not controlled pollution, but rather transferred it across different media. There is evidence to show that air pollutants removed by scrubbers from the stacks of a power plants are transferred to water through wastewater discharge, or transformed into sludge, become a solid waste disposal problem. By focusing on end-of-the pipe solutions the current system has impeded the development of pollution prevention measures such as process changes in production or materials substitution to minimize hazardous wastes.
5. An integrated approach to pollution would likely cut the costs of pollution control. The transactions costs of firms complying with multiple permits required by the existing regulatory system are significant. An integrated approach based on a single facility wide permit could lead to a more effective environmental auditing that could eliminate unnecessary waste streams. It would also lead to more efficient designs for new plants because pollution control could be optimized for the whole plant instead of each requirement being met by a separate piece of equipment.[6]

The preceding discussion has outlined the advantages of an integrated approach to environmental management but what would integrated pollution control look like? This is a difficult question to answer directly because integrated pollution control is a concept that embodies a number of meanings. At its most sweeping, IPC has been defined as "the range of organizational and legislative changes that enable institutions to deal with the connected nature of environmental problems."[7] In a more restricted sense, it has referred primarily to multi-media permitting of industrial facilities.

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[6] Irwin, Frances. 1992. "An Integrated Framework for Preventing Pollution and Protecting the Environment" in *Environmental Law, Northwestern School of Law of Lewis and Clark*, vol.22, no. 1; and Davies, Terry. 1988. *The Environmental Protection Act* (The Conservation Foundation).

[7] *Integrated Pollution Control in Europe and North America*. 1990. N. Haigh and F. Irwin, eds., London: IEEP.

To help us picture where the IPC initiatives of the Netherlands, Britain, and Sweden are located on this continuum, let us briefly enumerate the components of a largely idealized integrated environmental regulatory system. It would require:

- a vehicle for integration (e.g., a unifying comprehensive federal statute, or incremental statutory reform; or administrative reform under the existing statutes);
- closer coordination of the activities of environmental agencies with those of other governmental departments dealing with environmental matters (e.g., transport, agriculture, land use planning, national parks, etc.);
- greater reliance on analytical tools such as life cycle assessment and environmental mass balance accounting to enable the regulatory system to identify and mitigate polluting substances at any point in the production and marketing chain;
- more extensive monitoring to detect cross-media transfers and the development of new techniques for modeling the fate and transport of pollutants across media and of ecological risks;
- a uniform standard, such as unreasonable risk to optimize decisions concerning the ultimate disposal of polluting substances and greater reliance on comparative risk to help determine environmental priorities;
- facility environmental audits and the development of incentives for corporations to undertake long term environmental management strategies to encourage pollution prevention and waste reduction;
- compliance and enforcement programs based on multi-media inspections.

The logic of integrated pollution control seems unassailable as it promises a closer regulatory fit to the movement of pollution in the physical world. At the level of the individual facility or sector, IPC typically selects the best available technology across all media, encourages facility wide audits and seeks opportunities for pollution prevention and waste minimization. When integration occurs on the basis of a substance, rather than a facility or source, the regulatory effort considers the point where a substance enters the environment and then traces the movement of the pollutant through the entire ecological chain. This contrasts sharply with the traditional single-media approach to pollution, which considers what part of the environment (e.g., rivers, soil, air) is at risk from a particular chemical. In IPC, by identifying the environmental cycle of any particular substance, regulators are likely to be in a better position to know when and what type of intervention is appropriate to protect human health and the environment.

And yet, despite its impeccable logic, its promise of greater efficiency and effectiveness, integrated pollution control has been the subject of a number of criticisms in this country. These criticisms can be placed into two camps, the strategic and the operational. At the strategic level, integrated pollution is seen to upset the political apple cart, so to speak.

The current regulatory system with its many statutes and committees, it is argued, provides lobbyists, environmental groups, and citizens with the necessary handles to influence and challenge environmental decisions. An integrated pollution control system, based on a unified statute, could create a political and regulatory landscape with few familiar features and footholds. Within Congress itself, the political reward structure currently favors ad hoc responses to newly identified problems. When a new environmental problem comes into public view, such as Superfund in the late 1970s, Congress can generate legislative activity in order to respond to a newly galvanized constituency. To what extent, critics of IPC ask, could the complexities and technical complications inherent in cross-media analysis generate the same sort of public concern and political will as have the lengthy campaigns for clean air and clean water. And there is the lingering suspicion, especially among the environmental community, that IPC is a stalking horse for less stringent environmental standards, and that any radical reform of the environmental laws of this country, given the political sentiments of the 104th Congress, would be untimely.

At the operational level, the idea of IPC comes in for additional criticisms. For many the technical challenges are daunting. Moving from single-medium to multi-media risk assessment presents a number of uncertainties that risk assessment is not yet able to resolve: multi-media risk assessment would have to account for changes in exposure patterns and changes in the toxic effects of chemicals. Shifts in exposure routes can alter the dominant form of toxicity, the parts of the body affected, and the effective doses. In the face of this complexity, some argue, there may well be paralysis by analysis rather than prompt regulatory action. In addition, the "start up" costs of IPC, it is suggested, could be prohibitive: integrative permits require inspectors who are highly trained in cross media analysis and the reorganization of EPA to achieve integration could be more protracted and costly than anticipated, with lengthy turf battles and disruption.

Clearly one obstacle to IPC in the United States is the lack of familiarity with IPC efforts elsewhere. In the Netherlands, for example, in what is perhaps the most profound attempt to create more integrated forms of environmental protection, IPC efforts were first championed by a political coalition of the right-center but the coalition partners' support of the program--notably the elimination of a commuting tax deduction for private car users--contributed to the fall of the government. Nevertheless, the succeeding center-left coalition continued to support the IPC initiatives. IPC need not be a political football. In Sweden, there is a considerable and impressive track record of integrated permitting across media at industry facilities; in the Swedish example much of the authority for permitting decisions has been devolved to county and local municipalities, an example that suggests IPC can be part and parcel of an approach to environmental management's that gives sub-national units of government a significant amount of responsibility for setting permit conditions that take into account the environment as a whole. And in the United Kingdom, where until recently environmental management was based on a single media approach, we now have an unfolding example of how a unified environmental statute can be implemented and how media specific

inspectorates can be reorganized into a single integrated inspectorate in the attempt to take a broader view of industrial pollution control.

There are also examples of integrated pollution control occurring at the state level in this country. In New Jersey, the state's Pollution Prevention Act (1991) requires a large number of firms to prepare pollution prevention plans in order to identify hazardous substances flows through the facility and to account for cross-media transfers. Drawing on these plans, the Office of Pollution Prevention, an office created by the legislation, has worked with a number of volunteer firms in a series of pilot projects to integrate air, water, and hazardous waste permits into a single permit.[8] Similarly in Minnesota, the state's Pollution Control Agency is developing an alternative permit program that allows participating firms the option of obtaining a single facility-wide permit for all sources of a particular emission.[9] These efforts, both in Europe and in various states, suggest that perhaps the question that needs to be asked is not whether IPC can work in this country, but rather what means are available to achieve it.

THE UNITED KINGDOM

Background

The first step toward a new system of integrated pollution control was taken in April 1987, with the decision of the Conservative government to establish a unified pollution inspectorate, Her Majesty's Inspectorate of Pollution (HMIP), to deal with the most polluting and complex industrial processes. HMIP combined the functions of the Industrial Air pollution Inspectorate, the Hazardous Wastes Inspectorate, and the water pollution staff within the Department of the Environment (DOE). While such a policy had been put forward eleven years earlier by the U.K. Royal Commission on Environmental Pollution, it was only when a number of interests coalesced that such a reform could succeed. The Royal Commission continued to lobby for a unified inspectorate, a new minister at DOE wanted an independent environmental protection agency located in DOE (the Industrial Air Pollution Inspectorate had been transferred from the DOE to another government department), and industry, formerly a stalwart against the Royal Commission's initiative, now took the view that a more coordinated pollution control agency within DOE would provide both a level playing field and protection from what some viewed to be irrational environmental legislation from the European Union (EU). The government, sensing an opportunity for "rationalisation" and the green vote in an upcoming election, requested a report from the Cabinet Office Efficiency Unit. The study concluded that a reorganization of the pollution control system into a single inspectorate was likely to be more rational and efficient.

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[8] Personal communication, Mike Aucott, New Jersey DEPE, June 1996.

[9] Rabe, Barry. 1994. *Integrated permitting: Experience and Innovation at the State Level*. Draft report prepared for the U.S. OTA Project on Alternative Approaches for U.S. Environmental Policy.

To make the newly created HMIP for England and Wales (the Scottish version was created at a later date) more than just an amalgam of the former inspectorates, it was evident that new legislation needed to be introduced to resolve a number of problems. Initially there was no statutory basis from which authorities could consider cross media pollution transfers; moreover, the procedures and the regulatory philosophies of the air and water authorities were markedly dissimilar. Air authorities had traditionally focused on industrial processes and point of emission releases, and required the "best practicable means," a technology standard, to control the most serious air pollution sources.[10] The agencies responsible for water management, the Drinking Water Inspectorate (DWI) of the Department of the Environment, and the National Rivers Authority (NRA), on the other hand, based their permitting more on environmental quality standards, and set discharge levels most often with regard to the characteristics of the receiving medium. In an attempt to reconcile these differences and to begin the legislative process, the DOE drafted a Consultation Paper on Integrated Pollution Control in 1988, which spelled out the government's strategy for a new system of pollution control; this document, based on lengthy negotiations between industry and DOE, formed the basis for the Environmental Protection Act of 1990.

Integrated Pollution Control in Principle

The Environmental Protection Act of 1990 introduced new controls aimed at limiting and preventing pollution from a wide range of industries. Those industries with the greatest potential to discharge pollutants to air, land, and water (called Part A processes) are subject to Integrated Pollution Control (IPC). The operators of these facilities must obtain a single authorization for all releases from HMIP in England and Wales and HMIPI in Scotland. In applying for an authorization, process operators must evaluate potential damage to the environment from each of their processes, select the best practical environmental option (BPEO) if their process is likely to involve the release of substances into more than one environmental medium, and demonstrate that the "Best Available Techniques Not Entailing Excessive Cost" (BATNEEC) will be used to prevent, minimize or render harmless polluting releases. New processes must meet BATNEEC immediately; for existing processes there is usually a requirement to upgrade to meet BATNEEC over 4-8 years, or to shut down.

While initial estimates suggested that 5,000 of the potentially most polluting processes in England and Wales would come under the regime, with full implementation of the system now complete, HMIP has received 2,090 applications, with the chemical industry accounting for roughly half. The authorizations reviewed by sector is given in Table 1.

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[10] Under the Clean Air Act of 1956 "practicable" was defined as "reasonably practicable having regard among other things to local conditions and circumstance, to the current state of technical knowledge and to the financial implications."

Table 1: IPC Authorizations

	Authorizations in Force	Outstanding Applications	Total
Fuel and power	**367**	**5**	**372**
Combustion	250	3	253
Petroleum	55	--	55
Other	62	2	64
Metals	**123**	**33**	**156**
Iron and steel	38	--	38
Non-ferrous	85	33	118
Minerals	**85**	**1**	**86**
Cement/lime	42	--	42
Other	43	1	44
Chemicals	**1,153**	**42**	**1,195**
Petrochemicals	40	3	43
Organic	624	17	641
Acid	77	3	80
Halogens	145	5	150
Inorganic	230	14	244
Fertilizer	20	--	20
Pesticide	16	--	16
Pharmaceutical	1	--	1
Waste	**133**	**2**	**135**
Incineration	86	--	86
Chemical recovery	43	2	45
Waste-derived fuel	4	--	4
Other	**23**	**123**	**146**
Paper and pulp	3	34	37
Di-isocyanate	11	24	35
Tar and bitumen	1	9	10
Shipyards	2	19	21
Textiles	1	9	10
Timber	5	27	32
Animal/vegetable matter	--	1	1
TOTAL	**1,884**	**206**	**2,090**

Source: ENDS Report 254, March 1996

The Act also specifies that certain industries with less serious potential to pollute (Part B processes) are regulated by local authorities in England and Wales and by the Scottish Environmental Protection Agency (SEPA) in Scotland. Operators of these processes must obtain an authorization from the local authorities and apply the principle of BATNEEC to emissions from air only.

To help process operators apply for an authorization, HMIP has developed a series of process guidance notes. These notes have a curious status. Although they have no statutory force, they detail the criteria which will be used by the enforcing authority to assess applications and thus provide the single most important means of establishing what standards are expected under BATNEEC and what balance operators must strike between environmental and economic considerations. Given the role of the guidance notes in setting standards that new processes must meet using BATNEEC, many important decisions concerning BATNEEC are settled with the drafting of the guidance notes rather than in the authorization procedure for individual processes. HMIP typically circulates two drafts of the guidance notes to industry before a final version is published. For each process, the notes typically outline the techniques for pollution abatement which represent the "BAT" (best available technology), though the BAT can be modified when the costs would be "excessive to the environmental protection to be achieved."

BATNEEC can be expressed as a requirement to employ specific hardware or in terms of release standards. Most often, however, HMIP relies on setting suggested emission limits rather than prescribing process options in an effort to stimulate process innovation in industry. In reviewing an application, an HMIP inspector will decide on what BATNEEC is for the individual process and though, according to the Act, BATNEEC for one process is likely to be BATNEEC for a comparable process, in each case the inspector can take into account factors such as configuration, size, and other individual characteristics of the process and local environmental factors.[11] The HMIP inspector, then, has important power to determine the definition of "a process"--a fuzzy concept for the chemical and pharmaceutical industries as we discuss below.

Following an initial appraisal by HMIP, the operator of the process must publish details of the application in a local newspaper and place a copy of the application (excluding confidential information) in a public register maintained by HMIP. In addition, copies of the application will be sent to "statutory consultees" (e.g., English Nature, Health and Safety Executive, Ministry of Agriculture, Fisheries and Food, but local authorities and NGOs are not considered statutory consultees). They will have, along with the public, twenty-eight days to submit comments on the application. If granted, the authorization and conditions attached to it will include operational details, emission limits, and monitoring and sampling requirements. Four years after it is granted, the authorization will be subject to substantive review, at which time the inspector will take into account monitoring returns, the compliance history of the plant, the complaints history as well as changes in technology and economic

[11] *Integrated Pollution Control: A Practical Guide*. 1996. Department of the Environment, U.K., p. 14.

circumstances. The purpose of the review is to drive industry toward cleaner technologies by slowly tightening the standards.

The discussion of BATNEEC and of IPC to this point suggests little in the way of groundbreaking strategies to those familiar with the many technical standards tied to permitting under the Clean Water and Clean Air Acts in the United States. But the Act also sets the objective that BATNEEC should be used for "minimizing the pollution which may be caused to the environment taken a whole." In other words, the best practical environmental option (BPEO), the cornerstone of integrated pollution control, is reached by choosing the optimal combination of BATNEEC techniques for a process when discharges to all media are considered. The Act defines BPEO as the "option which minimizes pollution to the environment as a whole, at acceptable cost, in the long term as well as the short run."[12] By creating a unified pollution inspectorate to ensure that the overall BPEO for all environmental media was achieved, Britain has gone further, at least in principle, than almost any country to introduce an integrated system of industrial pollution control.

U.K. officials and members of the Royal Commission, however, have recognized that determining a BPEO for any type of process would inevitably be a difficult undertaking. It requires broad familiarity with industrial processes, the identification of pollution pathways, consideration of the fate and transport of individual contaminants, knowledge of the buffering capacities of the receiving media, and the associated risks the pollutants pose to humans and to the environment. It requires, again in theory, extending cost/benefit analysis to individual media and the review of a range of alternative industrial process changes, control technologies, disposal options, and material substitutions before a BPEO can be identified. At the institutional level it requires lengthy and frank consultations among a number of parties. While identifying the BPEO might well uncover pollution pathways or waste streams that could be eliminated, it was felt that the complexity of the problems involved and the difficulty in quantifying what remained ultimately unquantifiable could lead inevitably to basing IPC on the subjective judgment of the enforcing authorities, an outcome that was unlikely to lead to public acceptance of the new measures.

To make the determination of the BPEO less the result of expert consensus and to bring a new level of public accountability to industrial pollution control, the Environmental Protection Act required information associated with licensing of prescribed processes under IPC to be made available on public registers. The idea was to provide an "audit trail" by which the public could review documentation and trace decisions back to the supporting evidence and documents, a clear attempt to move away from the "cosy" relationship that many felt had existed between industry and the regulators under previous environmental legislation.[13] Under the Act, the following is required to be placed on the Public Registers:

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[12] Ibid., p. 12

[13] *IPC: the First Three Years*. ENDS. 1994, p. 15. According to one source, site inspections before IPC often merely involved an inspector "popping in for a cup of tea."

a) Applications for authorization

b) Authorization granted

c) Variations, enforcement and prohibition notices issued

d) Revocation of authorization

e) Appeals against authorizations

f) Convictions for offences

g) Information about sampling releases

h) Directions given by the Secretary of State

i) Other matters relating to carrying on prescribed processes, or any pollution of the environment caused thereby

The data requirements for Public Registers under the Act, however, allow for a wide range of exceptions. Information can be withheld from the registers if it is classified as commercially or personally confidential, incomplete (e.g., initial monitoring results) or in draft form. Moreover, information that HMIP requires operators to submit after an authorization has been issued, such as periodic reports about their releases within the deadlines laid down by their authorizations, are not explicitly required under IPC regulations. In many cases an authorization for existing processes will specify improvement actions in order to upgrade the process to guidance note standards. The operator's upgrade reports, which describe the plant's progress in meeting these standards, need not be entered into the public record and thus information essential to assess environmental impacts, BATNEEC, and BPEO can be shielded from public comment.

While the limitations of the public registers can be traced to a tradition of environmental policy-making in Britain that has relied on closed-door negotiations and bargaining between senior civil servants and industrial managers, IPC in the UK must be seen as a major shift in the culture of industrial pollution control. Like various pilot programs in the USA (e.g., XL and state multi-media permitting programs in New Jersey, Massachusetts and New York), IPC in Britain seeks to minimize the effect of pollution upon the environment, to devote resources in a cost-effective fashion to eliminate or reduce the most hazardous forms of industrial pollution, to place responsibility for environmental management more firmly in the hands of industry, and to serve as a driving force for investments in industrial improvements that can lead to pollution prevention. IPC is a prescription for the rational environmental management of industrial pollution, but as we shall see it is not a guarantee.

Integrated Pollution Control: from principle to practice

BATNEEC and BPEO are the two central pillars of integrated pollution control in Britain and distinguish it from earlier, fragmented approaches to pollution control. Clearly, the success of IPC in fostering environmental improvements depends in large measure on the practical interpretation of these concepts and the willingness of industry to accept the tenets of

IPC and what previous studies suggest are the added costs of compliance with IPC standards.[14] The limited evidence thus far suggests a varied picture.

The early years

IPC has been implemented on a rolling basis. The fuel and power industry was the first industrial sector to be regulated under IPC in 1991. The next year waste disposal processes and the mineral industry (e.g., cement, asbestos, fiber, glass, ceramic) were brought into the fold, followed by the chemical industry in 1993, and the metal industry and a variety of "other" industrial processes in 1995. As noted earlier, the final wave of applications for existing processes was received by HMIP in January of 1996.

As one would expect, the early years of the new program were marked by transitional difficulties for both industry and the HMIP. The ENDS Report, *IPC: The First Three Years* (1994), provides the most systematic investigation to date of the implementation of IPC in England and Wales. The report was based on a review of 328 authorizations in the public registers on file by April 1993 and the results of a questionnaire sent to the process operators who had submitted the applications.

The report outlined a number of problems with the implementation of IPC:

1. *Inconsistent application of BATNEEC and BPEO by industry and HMIP*

Under IPC, permit conditions are typically negotiated separately for each site, unlike BAT requirements in the US where permitting authorities (at least in principle) rely on a binding national standard. In the UK, authorities may accept less stringent requirements than BATNEEC if the operator's application does not exceed relevant environmental quality standards (EQS). For most industrial pollutants, however, no statutory environmental quality standards have been set. In these cases, because process guidance notes are not prescriptive, the inspector can exercise considerable discretion in determining emission levels in an authorization. Emission levels for plants engaged in similar processes can vary according to the assimilative capacity of the local environment, the density of population near the plant, and the economic difficulties each plant would experience meeting the environmental performance expected for the particular type of process.

The first tranche of IPC authorizations satisfied neither industry, HMIP nor many environmental NGOs. For industry, the attraction of a level playing field and more streamlined permitting encountered what many in industry felt was considerable regional

[14] Genn, Hazel. 1993. *The Impact of Integrated Pollution Control on British Firms*. The report, based on on a sample of forty British firms, claims that the range of estimated direct and indirect costs to firms applying for authorizations was from 30,000 pounds for smaller firms to a high of several hundred thousand pounds. The ENDs report cautions that there are no authoritative estimates of the costs of implementing IPC, and that the information collected reveals a huge variation. On average the costs of complying with IPC requirements for existing processes as of 1 April 1993 amounted to 360,000 pounds.

variation among HMIP inspectors in demands for process information and requirements for improvements for similar processes.[15] This translated into unequal costs both in manpower hours and capital investments in pollution abatement controls. For HMIP, the first batch of authorization applications did not heed the requirements of the Environment Act. Less than a third of the applications HMIP received evaluated different abatement options and only a quarter provided even a brief discussion of the BPEO.[16] And while many companies rejected alternative technologies on the grounds that they would entail excessive costs, few supplied cost estimates to back up their assertions. For the environmental community, HMIP did not provide clear guidance on how to take environmental effects into account and failed to compel industry to consider the issue of pollution prevention. Process operators, it was argued, relied on end of the pipe abatement measures and focused on NEEC arguments to allow them to deviate from the BAT.[17] Without a formalized cost/benefit analysis that could make these tradeoffs more transparent, many felt that wider economic considerations and political pressures were pushing HMIP to authorize less stringent requirements than BAT in certain cases.[18]

2. *Defining process boundaries*

One of the key questions in permitting is around what unit in a manufacturing process should authorities integrate in order to better pinpoint source reduction opportunities. In the UK the basic unit is a "process" but the general definition of what constitutes a process in HMIP guidance notes did not entirely match up with the range of operations in actual plants. The process guidance notes, industry argued, did not correspond to recognizable production units nor to the areas of responsibility carved out for individual plant managers. Nor could they be accommodated easily to the fast-changing demands of the multi-process sites, such as the specialty chemical sector where the batch reactors and associated pollution controls used for different chemical reactions encompass more than one of the definitions of prescribed processes. It was argued that HMIP was demanding multiple authorizations for reactions run on the same equipment and that process operators had little guidance concerning control requirements on a day to day basis. It also proved difficult for inspectors to apply guidance notes to plants where a range of processes--some covered by IPC but others not--discharged to a common treatment plant or incinerator. While HMIP policy states that release limits should be set on waste streams before they reach the common treatment plant, the policy does not account fully for possible synergistic effects from multiple waste streams. It can be

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[15] Perriman, Rodney. 1995. "IPC Update--An Industrial View," *Proceedings from 62nd NSCA Environmental Protection Conference and Exhibition*, 23 to 26 Scarborough, 1995.

[16] ENDS, 1994, p. x.

[17] Personal communication, Roger Lilly, Friends of the Earth U.K., August 1996.

[18] Personal communication, Keith Allott, ENDS, August 1996.

argued that until all of the processes generating wastes are covered by IPC, the authorization may not necessarily lead to the BPEO.

3. *Transparency of the authorization process*

To establish public confidence in IPC, and to give a wide range of interest groups the ability to comment on authorization plans, the Act calls for an "audit trail" for each authorization to be lodged in public registers. These registers according to the Act are meant to be "accessible, easy to understand and clear and simple in operation." In the early years of IPC, however, the public registers were criticized on a number of counts. They were often poorly maintained, important information about the authorization plan, monitoring results, and inspector audit reports were often not put on the register, and there were no requirements for comments made by pressure groups or statutory consultees to be included on the register.[19] As noted earlier, reports made by the process operator and HMIP concerning the steps companies were to take to upgrade controls on existing processes in an improvement program were not routinely placed on the register. This meant that information about the environmental impacts of the process, the justification for BATNEEC, monitoring requirements, the weighing of environmental benefits against economic considerations, and even the timetable for upgrading operations could be kept from public scrutiny.[20]

4. *Failing to encourage industry to adopt cleaner technologies*

One important criterion to evaluate the success of IPC is the extent to which it compels companies to seek out pollution prevention or source reduction opportunities. According to the ENDS survey of process operators (n=120), only 8 percent claimed that IPC was a driving force for waste minimization and had led to cost savings, and only 9 percent of companies surveyed expected their authorizations to lead to a significant improvement in the environmental impact of their process.[21] One must take these statistics with a rather large grain of salt. It is difficult to disentangle the effects of IPC from other factors. Apart from IPC, there are numerous legislative and non-statutory pressures that influence the management of industrial processes and investment decisions to upgrade or refit plant operations. And unless companies were poised or had already put in place the measures that IPC required, it is unlikely that many would see benefits in the increased transaction and capital costs that, according to surveys of industrial operators, the new regime imposed.

There are perspectives apart from that of industry to assess IPC's effectiveness in improving environmental quality. When costs are considered one could argue that IPC has spurred increased capital expenditure in pollution control abatement measures. While

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[19] ENDS, 1994.

[20] FOE-U.K. 1996. Why the Public Must Have a Right to Know, URL: http://www.foe.co.uk/cri/html/why_rtk.html#find.

[21] ENDS, 1994, xiii.

detailed cost figures are questionable, survey data suggests that IPC requirements by 1993 had doubled the amount of investment on prescribed processes, a figure that was unlikely to be matched by voluntary environmental programs.[22]

Recent progress in IPC

IPC has attempted to respond to a number of the criticisms laid at its door during the early years of the program. For example, in the last few years process guidance notes have been more carefully drafted to correspond with readily identifiable production units as other prescribed processes were brought into IPC's rolling schedule. To facilitate the needs of permitting multi-process sites, such as those associated with the specialty chemical industry, IPC has refined the concept of "envelope authorizations." Instead of complying with a number of authorizations for individual batch jobs, a process operator can make adjustments in what is essentially an "envelope" of release limits for a range of chemical reactions run on a batch reactor.

To flesh out what have been essentially the bones of BATNEEC and BPEO, the IPC program is developing a method for "identifying and prioritizing releases and combining affects of releases to all environmental media in a single integrated environmental index (IEI)."[23] This approach would attempt to put BATNEEC decisions and the identification of BPEO on a more formal footing by creating a "template" for companies to use in submitting applications or improvement reports. In very broad terms, the index is derived by expressing the process contribution to environmental levels as a proportion of the EQS or an "environmental assessment level" (EAL) for the numerous pollutants without EQSs. These ratios are then added to arrive at values for each medium, which are then combined to determine the overall IEI. Process operators will be asked to compare the IEIs of various process options against their respective capital and operating costs. In this way, it is hoped, the index will reveal a "break point" where additional environmental expenditure yields insignificant environmental protection and ensure greater consistency and transparency to the weight of economic considerations in permit decisions.[24]

One early criticism of IPC in Britain was that it tended to focus on air emissions, the legacy perhaps of HMIP's beginnings as an air pollution inspectorate. With the establishment of the Environmental Agency in April of 1996, which has brought together HMIP, the National Rivers Authority, and Waste Regulatory Authorities, it is likely that the early focus of IPC on air pollution will give way to a more multi-media approach to industrial pollution.

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[22] Ibid., xv.

[23] Slater, David. Dr. "Environmental Requirements in Industrial Permitting," speech given at OECD workshop, May 9, 1996, p. 3.

[24] Ends Report 249. 1995. "In search of the best practicable BPEO," p. 23.

Conclusion

There has been no systematic evaluation of IPC since the ENDS report was released in 1994, when only 328 out of the total 2,090 applications had been submitted. Since the report was issued, it has become more difficult to isolate the impacts of IPC. During the last few years, corporate environmental performance has been influenced by environmental management systems, voluntary environmental reporting under the Chemical Release Inventory (modeled after the TRI program), and more extensive audit programs. Although it is difficult to disentangle IPC from these initiatives, according to a range of stakeholders interviewed in this report, IPC has undoubtedly influenced environmental performance in industry, and due to its statutory clout, it may well have reinforced alternative compliance schemes and voluntary programs.

From numerous interviews conducted in the course of this study it is clear that a wide range of policy actors, including industry representatives and process operators, environmental NGOs, and policy analysts have come to see IPC as an important means to improve the environmental performance of industry. IPC has helped companies identify pollution prevention opportunities, most notably those dealing with emissions to the atmosphere; it has helped companies better evaluate the overall environmental impacts of their operations and to devise improvement programs that take into account more fully priorities for environmental risk reduction; and through the application process and increased public scrutiny, IPC has helped to foster environmental awareness at the higher echelons of corporate culture.

Some concern, however, has been expressed that IPC is being embraced by more highly capitalized firms that have already taken steps to reduce or eliminate waste streams from their production processes. At this point, it is unclear how effective IPC will be to encourage less capitalized firms to seek out pollution prevention opportunities. According to a recent study, only 12 percent of Britain 3.5 million small and medium-sized businesses, which may be responsible for as much as 70 percent of industrial air pollution in Britain, incorporate environmental considerations into their business plans.[25] Moreover, it is unclear the extent to which pollution prevention or source reduction opportunities identified through IPC have resulted in significant direct cost saving to companies when the costs of complying with IPC are taken into account. For the most part, the benefits to companies from integrated pollution control could well be in the long term, with the development of new products, more efficient material conversion and transport strategies, and reduced consumption of energy.

Integrated pollution control in the UK provides important lessons for the US. The British experience suggests that if IPC is to spur industry to take into account the environmental consequences of its activities, it must proceed from a firm statutory basis that sets the requirements of the authorization process, defines BATNEEC and BPEO, and has the

[25] International Environmental Reporter. 1996. "Small, Medium-sized Firms may Cause 70 Percent of Industrial Air Pollution," January 24, p. 60.

necessary clout to impose substantial fines on recalcitrant firms for non-compliance.[26] Without a statutory stick so to speak, it is unlikely that the IPC initiative would have withstood the early hostility of industry.

The "narrow" British version of IPC is an example of an approach to industrial pollution that can be more readily adapted to the American regulatory context than an approach that is based on national planning and extensive coordination with other government departments and levels of government. Integrated pollution control, in Britain, provides us with a model of internal integration in which a new regulatory agency (e.g., the HMIP, later incorporated into the Environmental Agency in April of 1996) was created to implement the integrated pollution control provisions of the Environmental Protection Act of 1990.[27] The UK's aversion to national planning and the setting of explicit long term environmental targets--characteristics shared by American environmental policy--meant IPC in Britain has not developed into a broad-based plan for environmental protection that brought into the planning process other government ministries (e.g., Transport, Agriculture, Trade & Industry) whose decisions have a significant impact on the environment. One can argue that the focus of IPC on internal integration was necessary for IPC to take root and to deflect what could possibly have been internecine bureaucratic turf battles from the start.

As a result, however, integration in the United Kingdom is narrow, focusing on industrial pollution control from a limited number of sources, not on environmental protection writ large. It does not, for example, take into account energy and water supply concerns, raw material sourcing, or life cycle analysis of products. While this may not hamper identifying BATNEEC for a given process, it is difficult to argue that the best practical environmental option (BPEO) will be selected without regulators and industry taking into account the full range of upstream and downstream impacts. Implicit in IPC in the UK, then, are trade-offs between the vision of the Royal Commission for a holistic assessment of environmental impacts from industry and the political acceptability and administrative feasibility of IPC implementation.

THE NETHERLANDS

Background

The Dutch National Environmental Policy Plan (NEPP) attracted widespread attention when it was published in 1989 for it proposed a radical approach to put an industrialized economy onto the path of sustainable development within one generation. To achieve this ambitious goal, the plan promoted a new model for environmental policy, based on the

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[26] In recent years, IPC has fined a number of companies for violations of their authorizations.

[27] According to T. Davies in "Some Thoughts on Implementing Integration," in *Environmental Law*, vol.22 no. 1, 1992. Internal integration "is the integration of programs and policies dealing with air, water and land pollution." External integration is the "incorporation of environmental considerations into non-environmental sectors such as manufacturing, energy, agriculture, and transportation."

recognition that government alone can not adequately protect the environment by imposing a set of standards on reluctant industry and other polluting sectors of the economy. Rather, the role of the government, notably the Ministry of Housing, Spatial Planning and the Environment (VROM), was to create the conditions by which industry and consumers and other government ministries could come to realize their obligations to help solve environmental problems. Through the concept of "verinnerlijkin," or the "internalization" of environmental protection, the NEPP envisages a high degree of personal and corporate responsibility for environmental protection.[28]

The plan translates this concept of "verinnerlijkin" into the realm of environmental policy in two ways, each of which is based on integrated approaches to environmental management. The NEPP first identifies "target groups" in Dutch society whose activities have contributed significantly to environmental degradation. These target groups in the Dutch model serve as the primary "sources" of pollution and include: agriculture, traffic and transport, industry, gas and electricity supply, construction, consumers and retail trade, environmental trade, research and education, and societal organizations. Thus the NEPP integrates the source of pollution at the sectoral level and by so doing takes a broad approach to IPC, extending the concept in practice beyond the scope of industrial pollution control. The second integrating feature of the Dutch model is a focus not on any one particularly receiving medium but on eight "themes." These themes are complex, multi-faceted environmental problems that cut across policy and administrative boundaries. For example, the theme in which Nox emissions would be addressed is acidification. This theme cuts analytically across media and considers the effects of Nox emissions together with Sulfur, VOCs, and Ammonia on forests, soils, surface and groundwater, and even culturally significant monuments. Other themes are described in Table 2.

The NEPP calls for significant reductions in the emission of industrial pollutants, pesticides, and the amount of wastes generated by industry, agriculture, and consumers. With 1985 as the base year, the NEPP demands reductions in SO2, NH3, VOCs, and Nox of between 70-90 percent by the year 2010. Similar percentage reductions are set for nitrogen and phosphorous, substances that have contributed to widespread eutrophication in Holland. For heavy metals and pesticides, the plan calls for a reduction of 50-70 percent, and for waste disposal, NEPP calls for an 80-90 percent decrease in landfilling.

The ambitious reach of the plan can also be seen in its attempt to consider pollution problems at a variety of spatial and temporal scales. To address climate change, for example, the plan calls for an absolute reduction of CO2 emissions by 3-5 percent in Holland from the base years 1989-90. At the regional level, the plan specifies that the number of areas with signs of water depletion must be no greater by the turn of the century than in 1985 and be

[28] The Second National Environmental Plan (NEPP2) adopted by the Dutch Parliament in 1994 is very similar in intent to the original NEPP. In the NEPP2, the emission reduction targets of the original plan are unchanged. NEPP2, rather, focuses on new measures to help achieve the goals of the first plan.

Table 2: Environmental Quality Objectives and Emission Reduction Targets in the NEPP and NEPP+

Scale	NEPP THEME	QUALITY OBJECTIVE	EMISSION REDUCTION TARGET
Global	Climate change	Restoration of quality of higher air layers such that human health risks negligible; agriculture and natural resources not damaged	Stabilise CO_2 emissions at average 1989-1990 levels by 1995 Absolute reduction of emissions by 3-5% by 2000.
Continental, Regional and Local	Acidification	Improvement of environmental quality in Europe such that ecosystems, cultural heritage, human health, agriculture and groundwater can be protected with "normal maintenance"	Reduce emissions of acidifying substances (principally SO_2, NH_3, VOCs and No_x) by 70 to 80 percent
Continental, Regional and Fluvial	Eutrophication	Lakes, rivers and coastal areas can provide good drinking water, safe recreation and commercial fishing with-out need for excessive purification costs	Reduce emissions of eutrophying substances (principally P and N) by 70 to 90 percent
Continental, Regional and Fluvial	Dispersion	Environmental quality of all media such that human health risks kept to acceptable levels and ecosystems, agriculture, natural resources not degraded or in need of elaborate remediation	Reduction in emissions of priority substances (e.g. heavy metals, pesticides, some hydrocarbons) by 50 to 70 percent
Continental, Regional and Local	Waste disposal	Risks from waste disposal to humans and the wider environment reduced to an acceptable or, where possible, negligible, level	Decrease in size of the Netherlands waste stream by 70 to 90 percent; decrease landfill of waste by 80 to 90 percent; dispose of all waste, with a few exceptions, within the Netherlands borders
Local	Local nuisance	Only negligible health risks run in the ambient environment and no serious nuisance experienced that would cause people to be excessively restricted in their residential choice	Number of people experiencing noise nuisance in 2000 to be no greater than number in 1985. No more than 750,000 households experiencing odour nuisance by year 2000
Regional and Local	Groundwater depletion	Water consumption in equilibrium with capacity of surface water and ground water resources	Areas with signs of water depletion must be no larger in 2000 than in 1985 and reduced by 25% by the year 2020

Source: VROM 1994, "Towards a Sustainable Netherlands," p. 10.

reduced by 25 percent by 2020. And at the local level, noise and odor abatement schemes must be in place to protect residents from such nuisances.

By combining sector, substance, and place-based approaches to integrated environmental protection, the NEPP is perhaps the most theoretically sophisticated IPC initiative to date and represents a fundamental shift from the single-media approach to environmental control that had characterized Dutch environmental policy since the late 1960s, when the Dutch parliament passed the Pollution of Surface Waters Act in 1969, the country's first media specific environmental statute, followed by a host of media specific legislation in the course of a decade.[29]

Why was such a profound change to the country's environmental policies deemed necessary? And more importantly, by what means was the environmental ministry (VROM) able to forge a consensus among diverse groups for the need to embrace more integrated environmental policies? How did VROM counter the initial resistance to IPC from powerful sectors in the Dutch economy, or diffuse the bureaucratic infighting with the ministries (Transport, Agriculture, Industry) that ultimately co-signed the NEPP, or even develop a national plan in view of the long standing autonomy of provincial and municipal government to carry out environmental policies with minimal interference from the Hague.

The fundamental shift to more integrated approaches to environmental protection demanded by the NEPP were considered both necessary and inescapable. The influential report, *Concern for Tomorrow* (1989) published by the National Institute for Public Health and the Environment (RIVM), and which provided much of the intellectual and scientific basis for NEPP, concluded that even with the full application of existing end-of-pipe technologies it was not possible to prevent further environmental degradation and to create the conditions for sustainable development in the Netherlands.[30] The unprecedented emission reduction targets specified in the NEPP were the culmination of two years of rigorous analysis by RIVM and represented the level of pollution reduction required for the long-term recovery of the environment. To achieve these targets, VROM was compelled to seek new forms of environmental management because the stringent environmental targets set in the plan--a 70-90 percent reduction for a wide range of industrial pollutants from 1985 to 2010--could not be accomplished by traditional regulatory policies.

There were other events apart from the release of the RIVM report that gave a new impetus to environmental protection. At the top level of state, Queen Beatrix's Christmas speech in 1988 drew attention to the extent of environmental degradation in Holland and the need for new policies to achieve sustainable development, a subject that the Queen mentioned again in her speech to open Parliament. Once the need for more effective environmental

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[29] These media-specific laws include: The Groundwater Act, the Air Pollution Act, the Chemical Waste Act, the Waste Substances Act, and the Soil Protection Act.

[30] Paul Hofhuis, personal communication, April 1996.

protection policies had been given royal approbation, the environment became a dominating policy concern for successive governments.[31]

While the scale of environmental damage described in the RIVM report and taken up in the Queen's speech undoubtedly helped to persuade large segments of the public that the existing environmental policies needed to be reconsidered, without the careful planning on the part of VROM, and its intensive consultations with other government ministries and representations of various target groups in the two years preceding the release of the NEPP, it is unlikely that the plan would have gone as far as it did. Unlike the British experience with IPC, in which a new piece of government machinery (e.g., HMIP and later the Environmental Agency) was created to administer IPC, in the Netherlands a more integrated approach to environmental protection was created through lengthy negotiation and dialogue within the existing bureaucratic framework. In negotiating with other ministries, for example, VROM held to the principle that it was responsible for defining environmental quality objectives in the plan. To create incentives for co-operation, however, VROM was willing to bargain over the schedule in which the target reductions were to be achieved (e.g., 2010). Similarly in dealing with the private sector, VROM approached the most powerful and polluting regulated sectors in industry (e.g., chemical, metalfinishing, power generation) and conducted negotiations with representatives of the trade associations of each industrial sector to help determine the responsibility of each sector to meet reduction targets. These discussions had to first address the thorny question of the imbalance of information between regulated firms and the government. To establish baseline data on pollution levels and prospects for emissions reductions, officials from VROM and trade association groups (and in most cases, a mutually agreed upon independent consultancy firm) first developed an "emissions profile" for the particular industrial sector which described the sector's overall waste and emissions for the baseline year of 1985. An economic analysis was then conducted to forecast growth in the sector up to 2010 and a new emission profile was extrapolated from the predicted output levels. At this point, the government and the trade associations--again with the assessment of outside industrial consultants--determined the level of emissions reductions that could be achieved by 2010. These agreed upon reductions became the basis of industry's contribution to the overall target for industry specified in the NEPP.

Undoubtedly, Dutch political culture with its long tradition of physical planning and consensus-seeking among a relatively small economic and political elite favored this co-operative strategy. And yet it would be a mistake to attribute the NEPP entirely to the Dutch talent for consensus-building or to see the NEPP as having emerged fully fledged from VROM, like Athena from the head of Zeus. One important lesson to take away from the Dutch experience with IPC is that the NEPP emerged from intensive consultation but was also a refined version of a number of earlier initiatives taken by provincial and local governments.

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[31] Paul Hofhuis, personal communication. April 1996.

As early as 1983, six years before the NEPP was published, the Rijnmond Public Authority established an integrated environmental policy plan for the heavily industrialized Rotterdam area. The plan, approved by parliament, specified concrete steps to lead to more integrated pollution control, many of which were later taken up in the NEPP. It recommended:

- establishing structured consultations between the various ministries involved in environmental policy;
- drawing up periodic general environmental policy plans taking into account the activities relevant to environmental control;
- increasing the flexibility of environmental regulation;
- creating integrated permits for installations;

A second precursor of NEPP were the Indicative Multi-year Programmes (IMPS) that were first submitted to parliament in 1984. These IMPs were intended to serve as the initial vehicle to integrate the long standing media specific approach to the environment by first identifying themes and then by focusing control policy on the sources of environmental degradation (e.g., the activities of target groups). Clearly the previous policy initiatives provided an appropriate political and intellectual context within which the NEPP could emerge.[32]

The NEPP, however, goes far beyond the IMPS and earlier initiatives to integrate environmental protection. The NEPP requires a wider range of target groups at the national level to make substantial reductions in their pollution loading rates; it requires new administrative procedures for permitting and has thereby altered the traditional relationships between the national government and the provincial and municipal governments where the licensing of industrial installations is carried out; it has created new flows of information through intensive public education campaigns, by establishing right to know registers and more detailed reporting requirements that require the bulk of regulated companies to make public their company environmental management plan; and it has prompted a range of new policy instruments, the most important of which are the voluntary agreements, or covenants, that are signed between government and industrial sectors (see below for a more detailed discussion of covenants).

The Legislative Framework

The NEPP, as a plan and as a planning process, was instrumental in making VROM's integrated policies intelligible to both politicians and to the public, and it helped the environmental ministry create much needed momentum to push its initiatives forward. But to

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[32] David Bennett. 1990. "Policy Planning in the Netherlands," in Nigel Haigh and Frances Irwin, eds., *Integrated Pollution Control in Europe and North America* (The Conservation Foundation and the Institute for European Environmental Policy).

many of NEPP's supporters, the plan's integrative policies needed integrative legislation, a unified statute that could harmonize the complex and often overlapping requirements of the country's media-specific environmental laws and create more opportunities to pursue coordinated policies to reduce pollution at the source.

In 1990 the government introduced an integrated environmental statute, the Environmental Management Act (EMA), which came into force in 1993. The basis for the EMA can be found in an earlier law, the 1979 General Environmental Provisions Act (GEPA), which provided a framework for coordinating the different permitting arrangements set down in the various sector-based environmental statutes. The GEPA enabled one licensing authority (e.g., province, municipality, central government) to coordinate all the stages of permitting, even when a number of regulatory agencies were involved, and attempted to harmonize appeal procedures, and stipulate procedures for public participation and environmental impact assessments. Table 3 lists the chapters of each law and shows the extent to which the 1990 Environmental Management Act was built upon GEPA.

Table 3: Structure of GEPA and EMA

GEPA	EMA
1. Definitions	1. General (definitions)
2. Coordinations	2. Advisory bodies
3. Procedures for permits and exemptions	3. International affairs
4. Procedures for amending permits and exemptions	4. Plans
4A. Environmental impact assessment	5. Env. Quality requirements
5. General provisions on appeal	6. Env. zoning
6. Public access to information	7. Env. impact assessment
6A. Financial provisions	8. Installations
7. Advisory bodies	9. Substances and products
8. Further provisions	10. Waste substances
9. Final provisions	11. Other activities
	12. Obligations for measurement and registration
	13. Procedures for licenses and exemptions
	14. Coordination
	15. Financial Provisions
	16. Financial guarantees
	17. Measures in special circumstances
	18. Enforcement
	19. Public access to information
	20. Appeal
	21. Further provisions
	22. Final provisions

Source: VROM. Company Environmental Management as a Basis for a Different Relationship between Companies and Governmental Authorities: A Guide for Governmental Authorities and Companies. 1995.

Since 1993, most of the country's environmental laws have been incorporated into the EMA, with the important exception of the water pollution statutes, reflecting the entrenched positions of the country's thirty water boards (waterschappen), an institution created in the Middle Ages to protect Holland from flooding, but which now is responsible for combating water pollution.[33] The EMA provides the basic structure for the environmental plans and programs of the central government, the provinces (12) and the country's municipalities (640) and sets uniform rules for environmental quality requirements and enforcement. It also replaces the permit requirements of each media-specific statute (except for the Pollution of Surface Waters Act) with a one-permit system. The EMA, it should be noted, is a "modular" piece of legislation; of the Act's 22 chapters 16 are in operation and new chapters of environmental legislation will continue to be added.

From NEPP to NEPP2: An initial evaluation

The EMA commits the Dutch government to drawing up a new National Environmental Policy Plan every four years. In February 1994, the Dutch parliament adopted the National Environmental Policy Plan2 (NEPP2), which was developed on the basis of a comprehensive evaluation of the progress of the original NEPP up to 1992. To evaluate the effectiveness of the NEPP's policies, the National Institute of Public Health and Environmental Protection (RIVM) analyzed environmental trends based on key "theme" emissions and made forecasts of environmental quality in the years 2000 and 2010 given full implementation of NEPPs environmental policies. According to the RIVM study, significant progress was projected to occur on a number of fronts. By the year 2000 the study anticipates a 50 percent reduction in the release of heavy metals through product and substance controls placed on industry and agriculture, and a similar reduction in SO2 emissions through abatement technologies installed by refineries and power plants. The study also claims that reductions in nitrogen and phosphate loadings are on pace with the NEPP targets as well as reductions in the volume of solid waste going to landfills. Table 4 describes in more detail the results of the RIVM survey.

While the NEPP policies, according to the RIVM report, have led to significant progress in meeting the interim target reduction figures for a number of "themes," the study found that certain environmental emissions targets were not likely to be achieved by existing NEPP policies. CO2 levels, for example, remained high due in large part to lower energy prices than had been anticipated, increased per capita energy use and greater passenger car and freight traffic with the enlargement of the European Union.[34] Meeting the target reductions for Nox emissions has similarly proved difficult. While Nox emissions from traffic was reduced per vehicle mile traveled, these reductions were offset by increased

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[33] VROM. 1994. *Environmental Policy of the Netherlands*, p. 7.

[34] VROM. *Towards a Sustainable Netherlands*, 1994.

private car use. And groundwater depletion proved to be a more severe problem than originally described in the NEPP, due, in part, to the long time lags between changes in land use (e.g., drainage for agriculture) and the noticeable hydrological effects in adjacent areas.

Table 4: Projections of Dutch Environmental Policy

	Unit	1990	Objective 2000	Objective 2010	NEPP2[a)] 2000	NEPP2[a)] 2010
CO_2 emissions	10^9 kg	184	173-177		177 b)	
Usage of CFCs	10^6 kg	7,7	0		0	
NH_3 emissions	10^6 kg	216	82	25-50	86	70
No_x emissions	10^6 kg	576	238-243	60-120	366	227
SO_2 emissions	10^6 kg	207	75-90	50-100	92	75
Acid depositions	Acid eq./ hectare	4500	<2400	1230 [c)]	2600	2000
P discharged to surface water	10^6 kg	25	8	3-8	15	14
N discharged to surface water	10^6 kg	258	75	25-75	160	125
Priority substances[d)]	Index	80	<40		50	
VOC emissions	10^6 kg	459	193	117	255	230
Waste[e)]	10^9 kg	22,5	14,5	14	14	14
Noise annoyance	% serious annoyed	20	19	0	15	11
Water depletion[f)]	depleted land area index	100	75		80	67
Environmental costs[g)]	% of GNP	2,0			3,1	2,7

a) Forecast based on strong economic growth in European economies.

b) The analysis for CO2 has been carried out with different assumptions regarding economic growth and energy prices.

c) 1400 acid equivalents per hectare on woodlands corresponds to a mean deposition of 1230 acid equivalents per hectare for the Netherlands as a whole.

d) Mean reduction for cadmium, lead, zinc, copper, chronium, mercury, nickel, fluorides, fine particulates, PAH, dioxins and radon.

e) Incinerated, landfilled and discharged.

f) Base year 1985.

g) In 1994 prices.

Source: VROM: Environmental Policy in the Netherlands. 1994. p. 17.

Despite these setbacks, the NEPP2 does not embark on a new course from the original plan. While admitting difficulties, notably in achieving the NEPP targets for which the sources of pollution are based on numerous diffuse activities (transportation, consumers, small and medium sized industry), NEPP2 seeks to strengthen the implementation framework of the original plan in order to achieve the target reduction objectives set down in NEPP. To do so, NEPP2 promotes a four-pronged strategy:

1) The new plan calls for greater use of the target group approach, involving retail trade associations, consumer groups, and the shipping and aviation industries in negotiations that translate objectives of the plan into clear targets and tasks.
2) To assist consumers and others make more informed decisions about the environment, the plan requires that new forms of information about products and processes be made publicly available, such as right to know reporting requirements, eco-label schemes, and information campaigns.
3) To translate the demands for greater corporate and individual responsibility for the environment into concrete actions, NEPP2 calls for new pricing mechanisms to encourage markets for recycled materials, environmental taxes on fossil fuels, groundwater use and waste disposal to help internalize environmental costs, and infrastructure improvements (e.g., public transportation and non-road freight links, recycling facilities, etc.).
4) To intensify the use of self-regulation, for instance by covenants, to better tailor policies to the needs of different target groups.[35]

This latter recommendation builds on what is considered by many to be a singular strength of the Dutch approach--the use of covenants to encourage more flexible and effective environmental regulation. As noted earlier, covenants are broad, negotiated agreements that translate the critical load percentage reductions from the National Plan into sectoral requirements. They are written agreements signed by government and the relevant industrial trade association after lengthy negotiations, and they specify the timing and implementation of pollution control measures to be taken by companies to achieve the reduction targets. As voluntary agreements, covenants are based on civil law, not existing environmental legislation.

Covenants have been a central plank in NEPP and NEPP2. In the negotiations leading up to the original NEPP, government and industry agreed that it was necessary to provide industry with flexibility to achieve the significant emissions reduction targets called for by government, and to this end covenants were considered an ideal tool that could take into account the differences in the abilities of industrial sectors to meet NEPPs targets. Covenants have been instrumental in encouraging industry to participate in the NEPP reforms, and are

[35] Ibid.

widely considered one of the key mechanisms by which the environmental quality objectives of NEPP can be implemented by industrial sectors and individual firms.

Some fifty covenants have been signed in the past decade. Nearly half of these covenants are concerned with energy conservation and involve promises on the part of 25 industrial sectors to improve their energy efficiency by 20 percent from 1990 to 2000. Another 15 covenants relate to the environmental quality of products and cover packaging, detergents, plastic wastes, etc. These agreements set limits on the content or emissions of certain polluting substances in products. And finally, and perhaps most controversially, eleven covenants have been concluded with industrial sectors to reduce emissions by an agreed percentage within a negotiated time frame.[36] Because these latter covenants are viewed as central to Dutch IPC efforts, and have attracted considerable attention in other countries (e.g., the Common Sense Initiative, arguably, is an American stepchild) the remainder of this section will describe how such covenants work, their strengths, and their limitations in helping to fashion more integrative policies.

The Role of Voluntary Covenants

According to VROM guidance documents, covenants serve two separate functions: first they are appropriate as stop-gap measures until regulatory standards are in place so that environmental benefits can be realized as soon as possible. In this regard they serve as a bridge between the government's regulatory interests and company initiatives. Into this camp fall the product-based covenants and those that stipulate energy conservation. For example, as early as 1987, the government concluded a voluntary agreement with detergent manufacturers to eliminate phosphates from laundry detergent, a measure that was taken outside of formal legislation.

Covenants are also used when such agreements are likely to facilitate implementation of NEPP's objectives and to reduce enforcement costs.[37] Under this rubric are the covenants in which government negotiates pollution reduction targets with various industrial sectors. In neither case are covenants intended to replace end-of-pipe regulatory controls; rather they are intended to supplement regulatory standards and enhance the effectiveness of the permitting system by encouraging more self-regulation on the part of industry.

In the government's view, covenants are intended to bring about a cultural shift in industry's attitude to the environment by requiring each signatory company to develop and implement a detailed environmental management plan that commits the company to seek

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[36] de Graeff, J. J. 1994. "Environmental cooperation between government and industry in the Netherlands," speech (undated). According to *Environmental policy in the Netherlands: The role of industry*. VNO-NCW (1995) covenants to reduce emissions have been signed with the following industries: base metals, chemicals, dairy, paper, printing, metal working and electrical engineering, textile, abattoirs, brick making, rubber and plastics, oil and gas.

[37] VROM. 1994. *The Covenant as an Instrument of Environmental policy in the Netherlands*.

continuous improvement in environmental performance at all levels. With the covenant system, the government provides companies with the inducement of a more stable regulatory environment to encourage them to develop such plans and environmental management systems. Under the broad terms of a covenant, companies develop four-year plans for the review of local permitting authorities. These plans typically include an inventory of polluting emissions and energy consumption for the base year stated in the covenant, a description of emission reductions already achieved under existing permitting requirements, a summary of planned additional measures tied to an implementation schedule, and specified monitoring and reporting requirements to the local authorities.[38] The company plan is thus seen as instrumental in translating the sectoral targets of the NEPP into concrete measures at the local level and as a means, more broadly, of integrating innovative national environmental policies into the traditional permitting system. According to VROM guidance, a company's plan should be devised in close coordination with local licensing authorities and be linked to the company's permit. In practice, however, for local licensing and enforcement authorities, as we shall see, incorporating company plans into permitting procedures has not been straightforward and indeed has given rise to considerable tensions.[39]

The national government, for its part, has actively promoted the use of covenants for a number of reasons. Voluntary agreements, VROM argues, encourages companies to pursue an active and progressive environmental strategy. Moreover, by requiring all companies that sign a covenant to develop and publish a company environmental plan (CEP) every four years and progress reports annually, the government believes that the environmental performance of the company, and the company's intent, will become more transparent to the public and to the regulatory authorities. With the publication of company plans, and the provisions they contain for each company to monitor its performance, the government, in theory, obtains better information with less cost and effort, and claims it can then direct its enforcement activities more efficiently by focusing on companies in the sector which have not signed the covenant. Covenants are voluntary, but clearly firms participate in the covenant system in part to avoid the threat of increased regulatory scrutiny from VROM and other authorities responsible for environmental enforcement in Holland.

How Covenants Work

The rationale for the use of covenants assumes enlightened self-interest (for both government and industry) and the more rare commodity of trust between government and industry. According to interviews with the industrial representatives and government officials involved in drafting covenants, the lengthy negotiating process itself helped to foster trust and

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[38] VROM. 1994. *Environmental Policy in Action 1: Working with Industry*.

[39] Joke Goedhart, personal communication, November 1996.

cooperation.[40] While this has been explained as the Dutch penchant for finding consensus in what are difficult policy arenas, it might be more accurate to say that trust, or at least a propitious context for cooperation, was achieved by the administrative framework that has been established to negotiate and administer the agreement.

As of 1995, eleven industrial sectors, or branches, representing some 1,200 companies have signed voluntary agreements with the government with regard to emissions.[41] This coverage accounts for some 90 percent of the industrial pollution in the Netherlands. To take into account differences in the composition of these industrial sectors, the government has created two frameworks in which covenants are negotiated. For large, complex companies which employ a range of different processes, such as the base metal and fine chemical sectors, the trade association negotiates with VROM and ultimately signs a declaration of intent on behalf of the industry. Each company that signs the declaration must draw up individual company environmental plans which specify proposed reduction targets, phasing procedures, research planned by the company to promote further reductions, and a statement of the measures that will be taken to achieve the industry-wide goals. The environmental management plan of these larger companies is reviewed by licensing authorities at the provincial level and by the Department of Public Works and is incorporated into the company permit.

For more homogenous industries, such as gas stations and printing firms, characterized by a limited number of similar processes, the trade association negotiates what is essentially a model environmental plan on behalf of its members. This model plan, typically less complex than the plans of the heterogeneous companies, is then reviewed by licensing authorities at the municipal level and by individual water boards. In both cases, voluntary agreements are used to determine how the overall reduction targets for industry will be allocated by the government among the various industrial sectors.

As one would expect, there are a number of participants in these negotiations. The covenant with the printing industry (1993), for example, was signed by four ministers (Environment, Economic Affairs, Transport, and Public Works & Water Management) in addition to the Union of Netherlands Municipalities (VNG), an association of local authorities, and their counterparts at the provincial level, the Association of Provincial Authorities (IPO). The Association of Water Control Boards also took part in the negotiations and signed the agreement. On behalf of industry two trade associations, the Royal Association of Printing and Allied Industries (KVGO) and the Dutch Association of Board and Flexible Packaging Manufacturers (Kartoflex) negotiated with the government authorities.

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[40] Videotape of conference, "Innovations In Cooperative Environmental Management," September 1995, Washington, D.C. (videotape on file with author)

[41] While 15 industrial sectors have signed covenants, there are also product covenants and covenants with other target groups (agriculture, consumers).

The emissions reduction targets used in the negotiations are either those taken from the NEPP load reduction requirements for all sectors or are based on the emissions profiles that were discussed earlier in the section. The negotiations about the percent reduction targets can be ferociously contested.[42] The trade associations have protested over the pace of the implementation schedule (e.g., that a 70 percent reduction for chemical X is not feasible by 1998) and have argued for lower emissions targets than appear in the NEPP, claiming that the NEPP baseline of 1985 has punished pioneering firms which reduced emissions by that date and rewarded sluggardly firms that were major polluters in the past. In addition, trade associations criticize the emissions profiles as outdated and based on monitoring readings taken before industry had updated its production practices. The 70-90% percentage reductions in target emissions called for by NEPP and the emissions profiles, according to industry, are now difficult and extremely costly to achieve.

The role of the trade associations in the negotiations is of utmost importance. Unlike trade associations in the United States which primarily provide information to their members and lobby Congress, trade associations in Holland have more power to influence the actions of their members. In addition to lobbying and providing information to their membership, they also establish industry standards of practice for trade and commercial practices and have a long tradition of monitoring their members' compliance with these standards. In short, the function of the trade associations in the Netherlands to regulate their membership has made them a useful partner for the government in the covenant negotiations. Typically the trade associations have been able to deliver their entire membership to sign the various voluntary agreements.[43]

To a large extent, the trade associations are dominated by the interests of larger firms. These companies have exerted pressure on smaller firms in the same sector to sign the agreement. According to one account, the trade associations have even urged smaller companies to sign a blank sheet on the brink of an agreement with VROM.[44] While some companies may have good reason not to sign an agreement (e.g., costs, configuration of a plants, schedule, company studies that suggest the reduction targets are not feasible), the compliance rate is typically high because companies know that if they do not sign the agreement they will be singled out by the local permitting authorities as a recalcitrant firm and receive unwanted public attention.

Such compliance is necessary because covenants require each company (in what the Dutch call a homogenous sector) that signs the agreement to reduce their loading rates by an equal percentage. With different technologies in place and different production practices, some firms within a sector may have more difficulty meeting these targets than others, yet

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[42] Peter Smit, personal communication, May 1996

[43] Ibid.

[44] Ibid.

covenants, at least for the homogenous industrial sectors, do not take into account the varying ability and resources of each firm to meet these target reduction figures. If these reduction targets were allocated on an efficiency basis, or through some sort of trading program, many believe that the trade associations, which have adopted the view that all members must make similar emissions reductions, would splinter and the government, which depends on these national federations as their "partners" would have to deal with a number of disparate groups.[45] Efficiency in reducing emissions would be countered by inefficiency in administration.

After voluntary agreements have been signed, covenants are administered by the NEPP Industrial Advisory Committee (IAC), a joint committee of government and industrial representatives, that performs a number of important functions. The IAC serves as a central repository for company plans and receives progress reports from each company on an annual basis. The IAC makes these reports public (excluding any commercial sensitive information) and can thus evaluate progress toward the target plans established in the agreements. The IAC coordinates technical and policy task forces to consider if target plans need to be modified in light of major changes in the economy or in response to changes in technology, and can intervene with VROM, the local authorities and other government signatories of the covenant, on behalf of individual companies seeking adjustments to their individual company targets.

Covenants are often touted as a win-win outcome, but one could argue they represent more accurately a compromise. By signing a covenant, companies are expected to comply with environmental standards but the standards themselves are set below what the government believes the sector could achieve. The lowering of certain emission reduction targets for a particular sector is set against the benefits of a high compliance rate, and a belief on the part of the government that the company environmental plan is the first step to a new integrated approach to the environment. One can perhaps envision the long-term benefits of covenants. Companies in a particular industrial sector are given a level playing field with respect to percent reduction of pollutants (if not in cost or actual emission levels); and with more time to plan environmental investments, companies are more likely to develop technologies to meet the sector targets in the most efficient manner. The government on the other hand benefits by more standardized regulation, particularly for "homogenous" industries, a shift in its enforcement activities from end-of-pipe inspections to the evaluation of companies' environmental management plans, and greater insight into the plans and capacities of companies that can ultimately lead to better environmental results. And yet for a number of environmental groups and local government enforcement authorities, the benefits of the covenants are viewed with a good deal more skepticism. As a member of one of the leading Dutch environmental NGOs recently claimed, covenants "reduce pressure on companies with a poor environmental record to comply with what they have promised, and they [covenants]

[45] Paul Hofhuis, personal communication, April 1996

don't contribute to sustainability."[46] In the next section, we look in more detail at the arguments against covenants.

Problems with Implementing Covenants

Much of the criticism directed at covenants falls into three categories: (1) the legal basis of the agreement; (2) the unclear relationship between covenants and the traditional permitting regime; and 3) the central role assigned to company environmental plans (CEPs) to substitute for, rather than supplement, the customary inspection and enforcement activities by the licensing authorities.

Covenants are private agreements signed by government and trade associations. They operate in what one could call the interstices of Holland's environmental statutes. As private agreements, the negotiations are not open to NGOs or other lobbying groups, and third parties can not directly challenge decisions taken by government or the industrial sector to amend or alter the covenant percentage reduction targets or the phasing of the agreement. Many in the environmental community are concerned that the covenants have, in essence, extended the deadline for companies to meet environmental quality improvements and point to clauses in the covenant agreements that provide firms with an easy exit if compliance with the goals of the covenant become too costly.[47] For example in the covenant government concluded with the printing industry, Article 1.2 states:

> "The parties are of the opinion that, for environmental laws and regulations to be implemented in a reasonable way, individual companies must be able to deviate from the timetable referred to in 1.1. if several measures are required simultaneously, and the joint cost would be excessively high."[48]

Critics argue that if it becomes evident in the lengthy course of the covenant that companies are unlikely to meet the target reduction figures on schedule, the government and the industrial sector will have to negotiate a second covenant and that companies will be given even more time to meet environmental goals.[49] The dissatisfaction with the legal basis of covenants has also been expressed by environmental enforcement officials. According to a recent, comprehensive study of environmental enforcement in the Netherlands, several enforcement officials "have cited examples of violating facilities using their covenants as a

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[46] Teo Wams, remarks at "Innovations in Cooperative Environment Management," Washington D.C., September 1995.

[47] Jans Henslemann, Ralph Hallo, personal communication, June 1996

[48] Document on file with the author.

[49] Peter Smit, personal communication, May 1996

defense for their violations. These officials are pessimistic that any environmental benefit promised for in the future will ever be realized."[50]

This assessment of covenants by local enforcement officials points to what has been a more pervasive structural weakness in the implementation of voluntary agreements. The role of the provincial and municipal permitting authorities in implementing covenants is not stipulated in legislation, but rather emerges from the procedures drawn up by the Industrial Advisory Committee of each agreement. This has led to considerable uncertainty among the licensing authorities, and a number of authorities have been reluctant to cooperate with the trade-offs implicit in the covenant approach which they see as excessively lenient to polluting firms. In other cases, this reluctance is reflected in the decisions of local authorities not to impose the "stick" that the central government holds over companies that do not sign a covenant, which is to impose on them the full range of sector targets.[51]

At the root of the problem is the need on the part of VROM to devise a new national strategy based on private agreements and company self-regulation in the context of a licensing regime that has traditionally called for state-of-the-art technologies and strict emissions standards. According to Peter Smit, a risk assessor who has worked with both government agencies and large companies in covenant negotiations, "while covenants are thought to be flexible instruments, enabling firms to meet environmental performance standards in their own fashion, permits are where the action really occurs and permits afford little flexibility. Technical standards [i.e., emission levels for individual pieces of equipment or productions process] dominate the permitting process, and the intensity of inspection and compliance control are tied to the emission guidelines for air, land, and water. The best practical environmental option is not considered in industrial permitting."[52]

To integrate pollution control at the level of permitting, and to guide the licensing decisions of local authorities, the Environmental Management Plan and VROM's Decree on Installation and Permits, require that permits are based on emissions that are "as low as reasonably achievable" (ALARA). To support this approach, the government has devised a set of reference standards (EQS) that are considered reasonably achievable, but these standards do not have legal status and are viewed as guidelines for licensing authorities. To date, it appears that the ALARA principle has made little headway with local licensing authorities.[53]

A third area that has been extremely controversial is the manner by which government intends to use company environmental plans in licensing and enforcement activities. To

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[50] Lauterback, Andrew (USEPA). 1995. Report *on Environmental Criminal Enforcement in the Netherlands*.

[51] Wallace, David. 1995. *Environmental Policy and Industrial Innovation: Strategies in Europe, the US and Japan* (London: The Royal Institute for International Affairs).

[52] Peter Smit, personal communication, May 1996

[53] Peter Smit, personal communication, May 1996

encourage companies to devise and put into practice environmental plans, the government has asked local licensing authorities to make company plans the basis of their permit conditions. One means to reward companies for submitting detailed plans is for the licensing authorities to provide them with an "outline" license. An outline license for these certified companies would be much less detailed than a traditional license. Instead of prescribing hundreds of regulations, an outline license would focus on the objectives agreed in the plan and would contain no more than a few dozen regulations.[54] An outline license assumes, of course, that the company regularly audits its activities, provides accurate information about their environmental performance to the government and to the public, and should log and report any infringements to the licensing authorities.

In addition to streamlining the permitting process through outline licenses, the government has proposed that the rigor of enforcement activities should correspond to the quality of a company's environmental management plan. As VROM has noted, "the better the content of the environmental management system, with companies holding an EMAS declaration of participation leading the way, the more checks can move to being retrospective. The latter form of checking will be based on data supplied by companies via annual environmental reports, audit and accreditation reports or on data held open for inspection."[55]

In practice, critics have argued, this means that local permitting authorities will have to shift their focus from taking readings of emissions levels to evaluating the management system in place.[56] Because the most likely environmental management audit scheme that will be used in such a program (e.g., ISO14001) is procedural rather than performance based, inspectors will focus much of their attention on a company's organizational charts, training programs, internal monitoring program, etc., rather than monitor and measure emissions from polluting sources.

And in terms of enforcement, the greater reliance given to companies' environmental plans makes it unclear what are the appropriate standards licensing authorities or the IAC should consider when considering the company's breach of the covenant. As one observer has written, "Are three weeks of environmental training for certain employees appropriate, but one week insufficient? Should there be five employees in the environmental compliance department, or are only three needed?"[57]

These criticisms of certain features of the covenants suggest that, for all of the skill the government has shown at building a national consensus on the need to undertake more integrative approaches to environmental protection, the government has not come to grips with the question of how to accommodate new and unproven environmental management

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[54] VROM. 1995. *Environment & Companies*, p. 13.

[55] Ibid., p 28.

[56] Ralph Hallo, personal communication, May 1996.

[57] Lauterback, 1995, p. 82.

systems with the traditional licensing procedures of local authorities. Until this is achieved, one can argue that the promise of the Dutch approach to integrated pollution control will remain unfulfilled.

Conclusion

The Dutch experience in integrated environment management is by no means completed, but it nonetheless provides a number of lessons to policy makers. While it is difficult to imagine the U.S. EPA embarking on a national plan as did VROM with the NEPP, the history of IPC in the Netherlands demonstrates the importance of devising processes of policy planning that can lead to more effective coordination among government, industry, NGOs, and the public. One need not invent new agencies of government to implement integrated pollution control measures.

A second lesson to be drawn from the examination of Dutch environmental policy is the importance of forecasting. Undoubtedly, the impact of RIVM's *Concern for Tomorrow* (1989) led to a shift in thinking about what environmental protection entails and opened up possibilities for new and creative policy measures.

Clearly, there is much to be learned from Dutch efforts in negotiating covenants. Voluntary agreements to reduce hazardous substances contained in products and to encourage energy efficiency have been viewed favorably because they oblige industry to take actions leading to environmental benefits in areas where there is no legislation or formal regulation. By contrast, covenants signed with industrial sectors to reduce emissions operate outside of environmental statutes and, to a certain extent, outside the traditional administrative expertise of local licensing authorities; for this reason many have argued that covenants are likely to postpone or derail the intended benefits of integrated pollution control as set forth in the NEPP.[58]

And yet, it would be premature to dismiss the industrial emissions covenants as unworkable. While the relationship of emission covenants to permits is unclear and still evolving, one can nevertheless see that incorporating company plans into permits opens up interesting possibilities of combining general industry agreements with specific permits. In view of the imbalance of information and resources between government and industry, the covenants are a singularly important means by which VROM has attempted to carry out its regulatory responsibilities in a more efficient and effective manner. In the USA one might be skeptical about the intent or ability of industry to embrace the "verinnerlijking" concept, and yet it is likely that with the increasing interest in environmental management systems such as ISO 14001, the Dutch experience with covenants and company plans as the basis for permitting will be a source of much needed information about the possibilities and problems inherent in company self-regulation.

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[58] Jan Henslemann, personal communication, May 1996. Joke Goedhart, personal communication, November 1996.

SWEDEN

Background

As early as 1969, with the passage of the Environmental Protection Act, Sweden has followed an integrated approach to controlling air and water emissions from large industrial facilities and waste water treatment plants. Like IPC in the United Kingdom, the Swedish version of integrated permitting attempts to determine the best practical environmental option for all of the releases from an individual facility. But in contrast to the British approach to IPC which is administered largely by the Environmental Agency, an institution that is part of the central government, the Swedish program is largely carried out by the country's 24 county administrative boards and the 286 municipal governments (kommuns) throughout the country. The central government is not removed from the permitting picture however. The country's most polluting stationary facilities come under the authority of the National Licensing Board, a national agency independent of the Swedish environmental authorities, which functions more like a court of justice than a traditional permitting authority. Integrated pollution control in Sweden warrants our attention because it provides us with an example of the institutional arrangements that have enabled the Swedish EPA to devolve responsibility for permitting to county and local governments.

The Legal Framework of IP

The central pillar of integrated pollution control in Sweden is the Environment Protection Act, adopted by Parliament in 1969, and regularly amended since then. The Act established a licensing system for installations that posed a risk to the environment. The provisions of the Act and the 1988 Environmental Protection Ordinance clearly delineate the administrative structure of the permitting system. Together, the Act and the Ordinance

- define environmentally hazardous installations and rank them (A,B,C) according to their potential impact;
- require new installations or those that are to undergo modification or extension to obtain prior licenses (categories A and B) or, for less polluting firms (category C), to file a prior declaration;
- designate the authority responsible for preparing and issuing licenses (A: National Licensing Board, B: county administrative boards, and C: municipalities);
- describe the procedure for administering permit applications and specify how coordination should take place under other laws;
- set out requirements for the dossiers to be submitted by the applicants, as well as license conditions;
- describe the monitoring requirements and penalties for non-compliance.[59]

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[59] OECD. 1996. *Environmental Performance Review of Sweden*, p. 81.

Although the Act set out an integrated administrative structure, the law and its ordinances do not specify ambient environmental quality standards or effluent limits for industrial processes. In place of national standards, licensing authorities decide on emissions standards and permit conditions on a case by case basis.

Implementing Integrated Permitting

In 1992, the Swedish authorities were required to review the permitting conditions for some 95,000 installations. More than 90,000 of these installations (category C facilities) were handled by the municipalities and require only a prior declaration to operate. Some 4,800 installations required permits from the county administrative boards, and 450 installations, comprising the most polluting facilities in Sweden, were licensed by the national government. To administer this tiered system, the institutional setting for integrated permitting in Sweden is characterized by strong coordination among national agencies, county governments, and municipalities.

At the national level, three separate and relatively independent institutions are largely responsible for Sweden's environmental policies in general and permitting in particular. The chief responsibility for environmental matters at the governmental level is vested in the Ministry of the Environment. The ministry formulates legislation and environmental policies and is responsible for nature conservancy, environmental protection, chemical control, environmental research, radiation protection, as well as land use and physical planning.[60]

The Swedish Environmental Protection Agency (SNV) is the central administrative agency, charged with implementing government decisions on environmental protection. The agency was established by Parliament in 1967 and was initially structured along media specific lines (e.g., air, natural resources, water, and information administration). In 1971, two years after the Environmental Protection Act was adopted, the air and water divisions of the agency were combined. A second major reorganization resulted in an agency structure that corresponds to industrial sectors. Accordingly, there are now divisions for wood products, pulp and paper, chemicals, waste treatment, and food. The agency staff has considerable expertise in both technical and scientific matters concerning the environment, and the agency constitutes the major source of information on the "best available technology" for industrial processes. The SNV is also responsible for providing guidance to county and municipal licensing boards and for coordinating their environmental efforts.

The National Licensing Board for Environmental Protection is comprised of some thirty persons, including lawyers, scientists, industry representatives and environmental NGOs. The board issues permits to the country's category A facilities, those that are considered to pose the greatest threat to the environment. The licensing process at the central government level typically takes the following course: first, before the full board convenes to discuss the permit

[60] The Swedish Institute. 1996. URL: http:/www.si.se/english/factsheets/environ.html

application, the plant operator meets with the board's technical specialists. In these initial encounters, the applicant describes the plant's materials inputs, the production processes employed, the types and volumes of emissions, as well as the environmental priorities of the company, and the feasibility of controlling emissions. The technical committee then gives initial advice on what it believes to be the best available technology in the circumstances.

In the licensing procedure, the Board uses BAT as the starting point for setting the level of permitted discharges and defines it as the best technology used at a commercial scale at a similar plant anywhere in the world. The technical committee's involvement does not end here. Under the Environmental Protection Act, the board is required to engage in extensive site inspections and follow-up consultations with the applicant to identify pollution prevention and waste minimization opportunities. After the site inspections and negotiations with the applicant, the technical committee recommends the BAT for the installation and sets pollution targets for the company which, according to the Environmental Protection Act, must take into account the costs of installing the technology and the environmental benefits that would result. In some cases, the emission controls recommended by the technical committee may result in less stringent limits than the BAT when the buffering capacity of the local environment can assimilate the pollutants.

After the technical committee makes its recommendations, the plant operator then submits an application for consideration by the full board. The license application, along with the technical committee's recommendations, is made available to the public and to the other licensing authorities. At the hearings, which are presided over by a magistrate, members of the public are invited to give their views. The decision of the Board in most cases is accepted, though in 1992, 15 percent of the Board's permit decisions were appealed to the courts.

In a typical appeal a plant operator may claim the Board's permitting requirements are derived strictly from BAT limit values and have not adequately considered environmental quality standards (EQS) or the costs of installing the technology. In one recent case, a steel making plant appealed the Boards permitting conditions on its sintering operations, arguing that the pollution controls imposed by BAT would not achieve significant local environmental improvements.[61] Though the permitting authority did not contest this claim, the appeal was not upheld and the plant operator ultimately closed the sinter plant, finding it more cost-effective to buy the material (i.e., pellets) from other manufacturers than to produce it under the conditions of the permit.

Once the appeal process runs its course and a permit is formally granted, there are no legal means available to challenge the licensing of an installation. This limited legal recourse can cut both ways. The licensing process offers protection for the environment, but it also provides safeguards for the plant operators that the license conditions will be maintained. This hesitancy to use litigation to revisit environmental decisions has implications for the public. While the public and environmental NGOs may have access to good information

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[61] OECD. 1996. *Iron and Steel Case Study BAT/EQS*, p. 22.

about an installation's environmental performance and a seat on the board (at the national and county levels), their legal rights to challenge a permit decision are circumscribed.

A similar licensing process occurs at the county level for category B facilities but at a somewhat smaller scale. The role of the technical committee of the National Licensing Board is most often taken by a single inspector, who can rely on technical support from the SVA. The applicant first engages in lengthy consultation with the inspector and other technical specialists at the county level; together they negotiate an environmental strategy based on BAT, economic considerations, and environmental quality concerns. Appeals are made to the national board, but they appear to be less frequent at the county level.

To bring consistency to the permitting system, especially at the county level, the government has issued effluent guidelines for some thirty industrial sectors. These national guidelines do not, however, carry the force of law. According to a member of the National Licensing Board, regulatory consistency in integrated permitting is based more on adhering to principles rather than inflexible standards.[62] As noted earlier, the principles that guide the permitting decisions are: (1) the use of best available technology; (2) the economic feasibility of the meeting the permit conditions; and (3) the best practical environmental option.

Because permitting has taken place on a case by case basis for nearly a quarter of a century, and there appears to be a consensus that the system is working well, the Swedish authorities have not been compelled to devise "templates," as have the UK IPC authorities with the Integrated Environmental Index (IEI), that seeks to clarify the questions of how costs should be balanced against incremental emissions reductions. Integrated permitting in Sweden is less amenable to analysis because many of its decision criteria (e.g., at what point do costs influence the selection of BAT, how do standards based on BAT relate to environmental quality standards, etc.) have not been formalized but rather are based on the considerable discretion of local inspectors.

As we have seen, the bulk of permit decisions take place at the municipal and county level. At this level, typically one inspector, trained in cross media permitting, is responsible for all environmental matters related to a single industrial plant. The inspector relies on support from technical specialists within the licensing authority and from the SVG, but it is the inspector's close familiarity with the facility and extensive consultation with the installation operators before a permit application is made that drives the licensing process.[63]

Other Efforts at Integration

While the focus of IPC in Sweden is largely on integrated permitting, the Swedish authorities have taken other avenue to integration that are worth noting. To a limited extent,

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[62] Ulf Bjallas. 1995. "The Swedish Integrated Permitting System," paper prepared for OECD Workshop on Environmental Requirements for Integrated Permitting, Paris, France.

[63] Lovei, Magda & Charles Weiss, Jr. 1996. *Environment Management and Institutions in OECD Countries*. World Bank Draft Report, Annex F, p. 3.

the Chemical Products Act (1985) and provisions in the amended Waste Collection and Disposal Act (1993) promote integrated pollution control. For example, the chemical law is based on the notion of the substitution principle which requires that "anyone handling or importing a chemical product must take certain steps, including avoiding a chemical product for which less hazardous substitutes are available."[64] The law covers the entire life cycle of chemical products, from production to final disposal and is enforced by the National Chemical Inspectorate (KEMI), which maintains a product register to monitor the flow of chemicals within Sweden. The inspectorate undertakes a rigorous site inspection program at chemical manufacturers and chemical importers to ensure the adequacy of industry data on chemical use, processing, labeling, storage, and disposal and evaluates the effectiveness of the substitution measures taken by chemical companies under the Chemical Products Act to reduce risk by replacing hazardous products with less hazardous ones.[65]

Similarly, the Waste Collection and Disposal Act amended in 1989 can be viewed as an integrating mechanism. The law requires producers to reuse and recycle wastes and to reduce waste generation. To implement the law, the government has passed ordinances specifying recycling rates and producer obligations for packaging (i.e., paper, board, plastic, steel, aluminum and glass), waste paper (i.e., newspapers) and scrap tires. In response, industry, importers, and traders which produce or handle these products have set up special companies to manage the collection and recycling systems for each of these materials.[66] As this "ecocycle policy" has only recently been implemented, it is premature to evaluate its effectiveness as integrative approach to environmental protection.

Conclusion

Sweden's success with integrated permitting stems from what Swedish commentators have called the "open and trustful dialogue between authorities and enterprises,"[67] a description that applies less readily to the American regulatory context. There are, however, more practical measures in Sweden's integrated pollution control experience that are worth noting for their usefulness at either the federal or state level in this country: the lengthy consultations between the technical committee of the National Licensing Board and plant operators during the earliest stages of the permit process, a hesitancy to use litigation to overturn environmental decisions, an environmental agency that is organized not along single media divisions, but rather in a form that corresponds to Sweden's industrial sectors; inspectors trained in cross-media analysis to identify opportunities for pollution prevention, source reduction, and the selection of the best overall environmental option; and a

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64 OECD. 1996. *Environmental Performance Review of Sweden*, p. 51

65 Ibid., p. 62.

66 Ibid., p. 53.

67 Ulf Bjallas, 1995, p. 3.

commitment at all levels of government to stringent permit conditions through careful monitoring of available technology.

THE EUROPEAN UNION

Background

Perhaps the most important recent development in fostering integrated approaches to the environment was the adoption of the Integrated Pollution Prevention and Control (IPPC) Directive by the Council of the European Union, on September 24, 1996. The member states of the European Union will now have to transpose the Directive (EU/96/61/EC) into their national laws within three years and by the year 2006 operators of existing installations covered under the Directive will have to obtain an integrated permit.[68] New installations in member states will need to comply with provisions of the Directive by 1999.

The IPPC Directive, according to one noted observer of integrated pollution control, "will drive environmental policy in the future."[69] Like the U.K. IPC regime, from which it borrows heavily, the EU Directive takes a source approach to integrated pollution control and aims to create a European-wide authorization system that requires large and medium sized industrial installations to obtain an integrated operating permit.

The IPPC Directive marks an important shift in the focus of the Community's environmental legislation. With the exception of two substance-oriented directives for asbestos (Directive 87/217/EEC) and titanium dioxide wastes (Directive 87/217/EEC), Community legislation related to the control of industrial pollution has been media-specific. Indeed, one of the primary motivations for the development of the IPPC Directive was the recognition that, while the Community had devised laws to impose controls on air and water pollution, it had no legal vehicle to control emissions to land or to curb transboundary effects of pollution. And while a number of its member states had enacted unified environmental statutes and had begun to administer integrated systems of pollution control, the Community lacked a legal mechanism to respond to the initiatives of these member states.

The IPPC Directive also aims at other targets that were brought into view by the report, *Panorama of EC Industry,* published by the European Commission in 1990. The report described the many advantages to firms of integrating technical processes through the introduction of clean technologies. These included savings in materials, in the removal of wastes, improved safety conditions, and a better corporate image.[70] Yet the report concluded that the level of expenditure in integrated process technology was exceedingly low, compared

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[68] The members states of the European Union include: Belgium, the United Kingdom, the Netherlands, Spain, France, Italy, Sweden, Finland, Greece, Portugal, Ireland, Denmark, Germany, Austria, and Luxembourg.

[69] Nigel Haigh, personal communication, August 1996.

[70] *Proposal for a Council Directive on Integrated Pollution Prevention and Control*. 1993. Commission of the European Communities COM (93) 423 final.

to the pollution control investments in end-of-pipe technologies. The report cautioned that unless more integrated incentives were devised, industry would most likely face more detailed and prescriptive controls based on single media regulations. This would make the pollution control system in member states more complicated, tend to partition wastes to that part of the environment that was, for the moment, the least protected, and impede technological innovation in the burgeoning sector of environmental remediation technology, a field that from the perspective of the E.U. was coming under the domination of the USA and Japan.[71] The economic and environmental costs of inaction were increasingly recognized by powerful constituencies within the EU.

According to the 1993 Commission Proposal, the IPPC Directive seeks to address three problems identified in the Panorama report: "the need to improve the current imbalance in technological know-how within the EC (the Directive provides for a comprehensive exchange of information and the application of BAT for new installations throughout the Community); lags in investments that have accumulated in some regions (the Directive requires permits to be updated); and, by the nature of the Directive itself, a move away from end-of-pipe technology to a more efficient integrated approach."[72]

The stated aim of the IPPC Directive is for a high level of protection for the environment as a whole, but the Directive should also be seen as an attempt to make pollution control more effective for industry and to level the playing field by imposing similar control measures and regulatory costs on industry across the European Union. By seeking to harmonize the national provisions for industrial pollution control of its member states, the IPPC Directive has been a source of considerable controversy and political maneuvering from the time it was released as a discussion paper by the Commission in 1991 until its recent adoption by the Council. For example, many northern European countries--Germany, Finland, Sweden--wanted a provision in the Directive to require that all new and retooled installations were obliged to meet predetermined release standards based on the best available technology. The Southern European countries--Italy, Spain, Portugal, and Greece--along with Britain argued for greater flexibility to depart from rigid release levels and to use environmental quality standards as a means to achieve more effective environment protection.[73] The Directive, as we shall see in the following sections, is a compromise which offers member states considerable discretion to interpret BAT and other provisions. As one leading "green" European Environmental Minister said, "We already have a two-speed Europe. We could have held out for more, but the fact is that something is better than

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[71] Ibid., p. 23.

[72] Ibid., p. 23.

[73] Aphrodite Morelatous, personal communication, June 1996.

nothing, and if we had continued to try to get a directive with a strict interpretation of BAT it would not have passed."[74]

An Overview of the IPPC Directive

The overall goal of the Directive is "to prevent emissions into air, water or soil wherever this is practicable, taking into account waste management, and where it is not, to minimize them in order to achieve a high level of protection for the environment as a whole."[75] This clearly is a broad description of integrated pollution control; it requires governments to take into account opportunities for waste reduction as well as pollution prevention, and it aims to reduce emissions from industry regardless of potential for harm.

Scope

The Directive covers "installations" rather than "processes"; in addition to the "processes" covered under IPC legislation in Britain, the EU version includes such activities as intensive livestock units, and food and drink plants (see Appendix 1 for a list of installations). The Directive also extends the scope of IPC by requiring the application of emission limit values, based on BAT, to a comprehensive list of priority pollutants liable to reach water from diffuse sources (see Annex II). The Directive requires that BAT will have to be applied with a view to preventing or, if that is not practicable, to minimizing these discharges. This is likely to have repercussions for a wide range of sectors throughout Europe. For example, in Britain a number of these priority pollutants are not covered under IPC, notably "substances which have an unfavourable influence on the oxygen balance." As a result, BAT-based discharge limits for sewage works taking in non-hazardous wastes for treatment may have to become tighter for nutrients, BOD and suspended solids, since currently only BATNEEC is required under IPC to render these substances harmless.

BAT

The central principle in the Directive for achieving integration is the use of best available technology (BAT) to prevent releases of pollutants to the environment or to reduce them to a minimum, and requires that permits set specific emission limit on the basis of what is achievable through the use of the best available technologies.[76] Under the provisions of the Directive, emission limit values--expressed as concentrations per unit time--are intended to

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[74] *International Environment Reporter*. 1995. "Environment Council Makes Breakthrough on IPPC, Ambient Air, Seveso Directive Update," June 28, p. 491.

[75] EU Directive 96/61/EC 1996 Official Journal of the European Commission 10/10/96, No L257/28.

[76] In the Directive emission limit values "shall mean the mass, expressed in terms of certain specific parameters, concentration and/or level of an emission, which may not be exceeded during one or more periods of time." And shall "apply at the point where the emissions leave the installation, any dilution being disregarded when determining them."

apply to the point where the emissions leave the installation and do not take into account any form of dilution or natural attenuation. The Directive, however, recognizes that emissions limit values are not the sole means to achieve environmental protection and therefore stipulates that environmental quality standards must be taken into account in setting release limits in permits. If the use of BAT is not sufficient to meet relevant quality requirements in what are environmentally vulnerable areas, the Directive requires additional measures to be taken, including limiting the number of polluting firms in a particular region and/or lowering the output of installations operating in the area. In those areas, where the environment is better able to cope with industrial discharges (e.g., when industries are located along fast moving rivers or tidal estuaries), derogation from emission limit values based on BAT may be appropriate provided that environmental quality standards are met.

The Directive's definition of BAT has been heavily influenced by the UK's position that BAT must not be limited to predetermined national emission standards--as Germany and other Northern European countries had advocated--but rather should balance the costs of the technology with the anticipated benefits to the environment. In other words, the Directive's BAT is broadly consistent with the U.K.'s concept of BATNEEC, in which plant permit conditions are set through site specific assessments.

Despite these similarities to the concept of BATNEEC, the EU definition of BAT is wider in scope. As with the UK's IPC, "Techniques" are defined not only as the technology used but also refer to an installation's design, construction, maintenance and operation. The EU directive adds decommissioning, which can bring BAT requirements to the cleanup of hazardous waste sites. The directive also specifies that special consideration should be given to a dozen conditions (listed in Annex IV) when BAT is defined in general or in specific cases. These include waste reduction, resource conservation, energy efficiency and a fuller appraisal of the cost and benefits to be taken into account when determining BAT.

Basic Responsibilities of Operators

In addition to setting release limits in permits, the licensing authorities in Member states will have to design procedures and take the necessary measures to ensure that the permitting process is based on the Directive's key principles. These include a requirement to apply BAT to prevent pollution; and a number of responsibilities on the part of the operator to cause no significant pollution; to avoid waste production, and where waste is produced to recover it; to use energy efficiently, and "that the necessary measures are taken upon definitive cessation of activities to avoid any pollution risk and return the site of operation to a satisfactory state."[77] While the Directive does not specify how the licensing authorities should take these principles into account, or define "significant" or "efficiently," the Directive, nonetheless, creates an explicit duty for the licensing authorities "to take account"

[77] IPPC Directive, Article 3.

these principles in their permit decisions and will likely force companies to be more explicit in their permitting applications as to how they intend to comply with them.

Permitting

A single permit is not required for IPPC, like in IPC in the UK, rather the Directive requires permitting decisions to be coordinated when more than one regulatory authority is involved in controlling releases to air, water, and land. All permits are required to contain emission limit values for the priority pollutants listed in Annex III (see Appendix X), and are required to lay down requirements for monitoring, data evaluation, and coordination with the competent authority. The permitting requirements also consider transboundary effects. Under Article 7 of the Directive, permits must contain "provisions on the minimization of long-distance pollution." Under this provision, a member state may request to be consulted when an installation in another country applies for an integrated permit.

Public Access to Information

The Directive makes explicit the right of the public to comment on applications for permits and to have access to monitoring results obtained by the competent authority in the course of the permitting procedure. These provisions for public information underscore the policy of the E.U.'s Fifth Environmental Action Programme which states that the public must be enabled to participate as fully as possible in the decision making process. The Directive recognizes that because integrated pollution control involves trade-offs to be made among media, and that BAT under the Directive requires a broad appraisal of costs and advantages, including considerations of waste reduction, energy efficiency and resources consumption, it is important for the various options to be put before the public with as much transparency as possible.

In addition to public participation in permitting, the Directive also provides that an inventory of the "principal emissions and sources" shall be published by the European Commission every three years. This inventory might resemble the Toxic Release Inventory (TRI), however it has yet to be determined what pollutants and sources will be covered.

Harmonizing EC emission value limits

As noted earlier, one of the central disputes leading up to the adoption of the Directive was whether the Directive should propose the harmonization of release limits for particular sectors. To butter the bread of the northern European countries which failed to secure standard emission value limits based on BAT for new and upgraded installations, the Directive requires Member States to send the Commission "available representative data" on the limit values they have set for processes subject to IPPC, and where appropriate, the BAT from which these values were derived. Within 18 months of implementing the Directive (1999), member countries must submit the first such report, followed by reports every three years. The Commission will organize an exchange of information for national licensing

authorities and industries concerning BAT and monitoring results. The Directive empowers the Commission to propose emission limit values for categories of installations and polluting substances "when the need for Community action has been identified, on the basis, in particular, of the exchange of information."[78] The Directive thus does not embrace harmonization, nor does it reject it out of hand. Whether or not the Commission will propose more Community-wide emissions limit values, depends to a large extent on the quality and scope of information gathered by the national authorities of the E.U.'s fifteen member states.

Conclusion

The IPPC Directive is a framework and inevitably member states will have considerable discretion to interpret its provisions and to select the means to implement the Directive (e.g., organization of "competent authorities," setting emission limit values, etc.) Article 3 of the Directive simply requires member states "to take the necessary measure to provide that the competent authorities ensure that installations are operated in such a way that all the appropriate preventive measures are taken against pollution in particular through application of the best available technologies." While some supporters of integrated pollution control claim that the new IPPC Directive will provide a "clear regulatory framework and a level playing field upon which industry can operate"[79] others are more cautious and claim that the compromises worked out in drafting and adopting the IPPC directive "could lead to lowering of environment standards and distortion of competition."[80]

It is of course impossible at this time to evaluate the impact of the IPPC Directive on the control of industrial pollution, or to draw specific lessons that can be applied to the American context. It is perhaps more useful to consider the possible implications of the Directive for U.S. environmental policy. For all of the horsetrading that accompanied its adoption, the Directive offers a cogent and coherent view of integrated pollution control for emissions from industrial facilities. Its main objective is to prevent or solve pollution problems rather than transferring them from one part of the environment to another; it promotes an environmental protection strategy which is more anticipatory, broadens BAT to include energy efficiency and the rational use of resources, and as a Community law, creates a legal obligation for industry to comply with the principles of pollution prevention, the use of BAT, waste reduction and recycling, and energy efficiency. Perhaps more importantly, by providing a framework for an integrated approach to industrial pollution from stationary sources, the Directive has begun an experiment in the 15 member states that is likely to go far

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[78] IPPC Directive, Article 18.

[79] Donald Bryce, Head of IPC policy in the U.K.'s Environmental Agency quoted in "Businesses Told Upcoming Directive Mark's Beginning of New Regulatory Regime," *International Environment Reporter*, June 12, 1996, p. 527.

[80] Finnish Environmental Minister Pekka Haavisto, quoted in "Environment council Makes Breakthrough on IPPC," *International Environmental Reporter*, p. 491.

beyond the narrow confines of integrated permitting. The Directive, one can argue, requires member states to seek solutions to many of the most pressing and difficult questions in environmental management: what is the proper relation between state, citizen and corporation for sustainability; how should societies set environmental priorities; how much discretion should be built into the regulatory regime; what conditions lead to technological innovations; how can the public participate more effectively in decision making, and how can environmental information be linked to a more nuanced and integrated view of the physical world. These questions extend far beyond the remit of most licensing authorities, but integrated pollution control, as a concept and now as a Directive in the European Union, will ultimately compel countries to tackle them. The EU Directive, in addition to recent IPC initiatives in Canada, Japan, and New Zealand, makes it certain that the United States and Australia will be the only two developed countries that do not have an integrated pollution control system.

Appendix 1: Interviews

Keith Allott, Assistant Editor, Environmental Data Service (ENDS), London, UK

Michael Aucott, Permitting Program, New Jersey Department of Environmental Protection

Ulf Bjallas, Judge, The National Licensing Board for Environment Protection, Stockholm, Sweden

Conrad Caspari, Director, Bureau Europeen de Recherches, Brussels, Belgium

Yves Devellennes, European Union representative, Washington, DC.

Hazel Genn, Professor of Law, University of London, UK

Joke Goedhart, Environment Officer, Association of Netherlands Municipalities (VNG), The Hague, the Netherlands

Nigel Haigh, Executive Director, Institute of European Environmental Policy, London, UK

Ralph Hallo, International Coordinator, Netherlands Society for Nature and Environment, Utrecht, the Netherlands

Mark Hammond, Environment Attaché, British Embassy, Washington, DC.

Jan Henselmans, Industry and Environment Team Manager, Netherlands Society for Nature and Environment, Utrecht, the Netherlands

Paul Hofhuis, Counselor for Health and Environment, Netherlands Embassy, Washington, DC

Frances Irwin, World Resources Institute, Washington, DC

Hans Lannerblom, Senior Technical Office, Swedish Environmental Protection Agency, Stockholm Sweden

Andrew Lauterback, Criminal Enforcement, EPA, Region I, Boston

Roger Lilly, Industry and Pollution Campaign, Friends of the Earth, London, UK

Aphrodite Morelatous, Greenpeace, Brussels, Belgium

Elenore Raven-Hamilton, Environmental Attaché, American Embassy, The Hague, The Netherlands

Peter Smit, Risk Assessor, Stallen & Smit, The Hague, the Netherlands

Appendix 2: Interview questions

Background to integrated pollution control efforts

1. What was the specific problem or problems with the existing pollution control system that the country's environmental regulatory agency intended to solve through integration (e.g., administrative efficiency, cost-savings, compliance, shift in targeted risks)?

2. What approaches have been taken by the central government to encourage integrative pollution controls (e.g., a comprehensive statute, the addition of multi-media provisions to statues when they are re-authorized, changes in administrative practice under existing statutes)? How have these approaches built on the country's institutional and cultural framework for environmental protection? (e.g., federal vs. centralized system of government, statutory authority of environment agency, national planning tradition, relationship of industry to regulating agency, etc.)

3. To what extent has the central government pursued external integration of the pollution control system by strengthening environmental efforts in non-environmental sectors such as transportation, agriculture, trade, and energy or through legislation, such as the National Environmental Policy Act (NEPA), that sets forth national environmental goals and policy and requires environmental impact assessments for all major federal actions? What initiatives have taken place?

Focus of Decision Making

4. What has been the focus of IPC initiatives (point source releases, non-point source, industrial processes, place-based controls, ecosystem risk)?

5. What analytical tools have been most helpful in designing integrated pollution controls (e.g. mass-balance accounting, life-cycle assessment, quantitative risk assessment).

6. What specialized information and data (e.g., chemical release inventories, plant level environmental performance data, GIS) were used to help design integrated pollution controls? What types of research are currently being undertaken to help assist IPC efforts?

Statutory Authority

7. What flexibility does the implementing agency have to set national environmental priorities and address new problems not specifically addressed by statute?

8. To what extent does the implementing agency work with the legislature to draft pollution control statutes?

9. What are the institutional arrangements for handling pollution controls between central government, regions, and local governments?

Setting Priorities

10. What is the role of risk in priority setting, and does the country have clear principles for evaluating relative risks (especially in areas where there is a high degree of uncertainty)?

11. Does the country have uniform principles for consideration of cost and risks in determining environmental policy? Do cost estimates refer to social costs or costs to the regulated firms?

12. To what extent does the country rely on "performance-based" methods, allowing flexibility in achievement of broadly stated goals, rather than on detailed, prescriptive rules?

13. To what extent does the country's approach allow flexibility to tailor requirements to the circumstances of particular facilities, geographic areas, or industry sectors? Where it does so, how does it evaluate the "overall environmental benefit" of alternative arrangements, particularly where doing so involves tradeoffs between media or pollutants?

Policy Instruments

14. What is the country's experience with selecting a best technology across media rather than for a single medium?

15. How has the country addressed the problem of coordinating administrative processes affecting regulated entities (permitting, reporting, record keeping, etc.)?

16. Does the country's approach to IPC create incentives for pollution prevention, rather than focusing narrowly on pollution control? How have economic instruments (energy taxation, marketable permits, waste disposal taxes, etc.) been used to encourage pollution prevention and waste reduction?

17. How have environmental concerns (E.I.As) been integrated into the country's land use planning system?

18. To what extent does the country's pollution control system target ecological protection as a primary element in its IPC policies. How are integrated pollution controls for industrial processes related to ecological protection?

19. What provisions exist in integrated pollution control measures for public involvement?

Evaluation

20. How are the results of IPC efforts assessed (e.g., emissions reduction, risk reduction, cost-effectiveness, distributional effects, green technology development, public acceptability, private sector compliance)?

21. Has the implementing agency developed a set of indicators to assess the effectiveness of IPC initiatives?

Appendix 3: Prescribed substances under IPC in the United Kingdom

Please contact the author for availability of Appendix 3.

Appendix 4: The IPPC Directive of the European Union

Please contact the author for availability of Appendix 4.