

PART I

OVERVIEW

Pollution Management: Key Policy Lessons

Progress toward bringing about a cleaner environment has relied on a philosophy of pollution control. This has involved sometimes costly measures and controversial political decisions. As a result, developing countries, poor communities, and financially constrained enterprises have often argued that the environment is an expensive luxury that diverts resources from more productive uses. This perspective is giving way to a new paradigm stating that neglecting the environment can impose high economic and even financial costs, while many environmental benefits can in fact be achieved at low cost. For this to work, however, we need to better understand what motivates those responsible for pollution and their responses to different regulations, incentives, and other pressures. Moreover, we can no longer afford to view the environment as a technical issue to be addressed independently from overall municipal and industrial strategic decisionmaking. The new approach can be summed up by the expression: environmental management, not just pollution control.

Change the Emphasis

Environmental progress over the past 40 years has relied on a philosophy of *pollution control*. A wide range of control technologies has been developed, and it is now technically possible to greatly reduce or entirely eliminate discharges of the major pollutants. However, this approach is yielding decreasing benefits per unit of expenditure in the rich industrial countries, and the necessary preconditions for implementing pollution control measures do not exist in many developing countries. At the same time, some countries fear that pollution control is an expensive luxury that will divert resources from more productive uses.

The emphasis is shifting to *environmental management*, using a broad mix of incentives and pressures to achieve sustainable improvements. This involves:

- Definition of environmental policies in terms of goals rather than inputs
- More explicit consideration of and reference to priorities
- Greater decentralization, especially with respect to the implementation of policies
- Promotion of improved performance and management rather than just control of emissions

- Adoption of cost-effective strategies rather than specifying particular control measures.

This chapter summarizes the main issues that have emerged in the course of operational work throughout the world.

Work with Agreed Priorities

Start with clear goals and objectives, not mechanisms. Governments need to set clear objectives for environmental issues, related to overall development and growth goals, before focusing on specific sector actions or institutional changes. These objectives are frequently set out in terms of human health, productive resources, and conservation of ecosystems.

An effective environmental strategy requires clear priorities.

In many countries, the task of improving environmental performance on the ground is unnecessarily complicated by a reluctance to define environmental priorities and to articulate clear strategies that address them. Often, this reflects a lack of political commitment to environmental policies. Yet effective environmental management depends on making choices. These choices form the basis for developing targets that can be

understood and assessed by communities and the public as well as by specialists. Without such an effort, the policy process is likely to be captured by special interest groups, whether these be committed to narrow environmental goals or to industrial growth without regard for its consequences.

Agree on priorities.

Dirty air (especially *fine particulates* resulting from incomplete combustion) and *lack of clean drinking water* are among the most important problems. It is easy to tell whether policies affecting these issues have been effective, and it is possible to gain considerable political capital from addressing them. Decisionmakers should therefore aim to set concrete goals that mean something to the public and politicians and then focus their attention on achieving real progress. This strategy will succeed only if progress toward meeting the goals is regularly monitored and the strategy is revised in response.

First do those things that are a high priority and that are also inexpensive and easily implemented.

Environmental policies often affect problems and people in unforeseen ways. Problems are often claimed to be critical even though they have little impact on human health or on sensitive ecosystems. Conversely, serious issues (e.g., dust pollution) may go unnoticed.

Problems that are relatively easy to solve but have large demonstrable benefits (e.g., removing lead from gasoline, switching home heating from coal to gas) are sometimes ignored in favor of concentrating on complex problems that require very large amounts of resources to address (e.g., nuclear cleanup). Some of the thinking on these issues is influenced by the priorities of industrial countries that have already solved many of the “simpler” problems with which developing countries still have to grapple.

Cooperative approaches are essential.

Adversarial systems of environmental management typically do not work well over a sustained period. Developing and implementing effective environmental strategies requires cooperation between enterprises and other polluters, regional and local authorities, and national agencies. Environmental authorities must, at a minimum,

ensure the acquiescence and understanding of most of those whom they seek to regulate, whether in the private or the public sector. A carrot-and-stick approach will still be necessary, but the carrot may be the opportunity to participate in critical decisions, rather than ill-directed financial assistance. Similarly, penalties for poor environmental performance may be expanded to include public exposure and social stigma, as well as financial levies.

Information is power; share it.

In many countries, formal regulations are difficult to implement, yet there is public demand for a cleaner environment and for more responsible behavior on the part of enterprises. Several countries are therefore experimenting with schemes to make the environmental behavior of enterprises public.

The evidence is very encouraging, suggesting as it does that enterprises value their public image and are willing to take steps to preserve it. The lesson: an informed public (or regulator) can achieve much through informal pressures.

Set realistic standards.

Strict standards, per se, often do not lead to a cleaner environment. In some cases, initial compliance deteriorates—for example, pollution control equipment is installed but is subsequently poorly maintained or is bypassed. In many cases, there is no enforcement culture, and the strict standards are ignored altogether.

Where new projects are being developed, the key to sound environmental performance lies in a comprehensive environmental assessment (EA) that must be carried out before any project design work is started and that should be based on close collaboration with local authorities and the community. The EA identifies the relevant emission levels and other measures necessary to ensure that the proposed project does not cause significant environmental harm. To the extent that the EA represents a genuine effort to reach a broadly accepted plan of action, the subsequent environmental performance can be expected to be far better than if the project is simply required to meet independently established strict standards.

Where existing facilities are to be rehabilitated, an environmental audit will provide the neces-

sary information on which to base cost-effective measures to significantly upgrade environmental performance.

Devolve Responsibility

Delegate responsibility downward as far as possible. The division of responsibility for environmental policy and regulation will depend on historical, social, and legal factors. Just as environmental authorities should not attempt to micromanage the decisions of individual enterprises and plants, national agencies should focus on the broad framework of priorities and instruments while devolving responsibility for detailed strategy and regulation to regional and local bodies wherever possible. This may be frustrating at times, but lack of local political or administrative commitment will sabotage policies imposed from above as much as would resistance from those who have to comply with them.

The overall legal and institutional framework should cover legislation that establishes specialized regional agencies such as water basin authorities or that gives national or subnational agencies powers to inspect premises, collect data, and impose various penalties. The lack of such a legislative framework has caused serious problems in countries where provinces or states have attempted to introduce discharge fees to recover the costs of dealing with water pollution and to provide an incentive for polluters to reduce their discharges.

Think strategically at the level of the river basin or airshed.

Where there are few significant sources of pollution in a river basin or airshed, it is fairly easy to reach agreements with the polluters to improve their performance. Where the river basin or airshed encompasses a large metropolitan area with numerous sources, a range of instruments should be applied, tailored to the capacity of the various implementing agencies. First, there should be a clear understanding of the contribution of different sources to water or air quality and of the options at each source that would lead to cost-effective overall improvement in quality. (See Box 1 for a checklist of the kinds of questions that might be asked.) Market-based instru-

Box 1. Strategic Choices for Cost-Effective Municipal Wastewater Investments: A Sample Checklist

- Have measures been taken to reduce domestic and industrial water consumption?
- Has industrial wastewater been pretreated?
- Is it possible to reuse or recycle water?
- Can the proposed investment be analyzed in a river basin context? If so, have the merits of this investment been compared with the benefits from different kinds of investments in other parts of the river basin? Note that a least-cost strategy for achieving improved ambient water quality may involve different (or no) technologies at different locations.
- Has the most cost-effective technology been used to achieve the desired improvement in ambient water quality?
- Has an economic analysis been done to assess the benefits (in terms of ambient water quality) that could be achieved by phasing in investments over, say, 10 or more years?

ments are useful but should be kept as simple as possible.

It may also be useful to allow enterprises to negotiate with each other to agree on cost-effective measures for achieving quality improvements in a given watershed or airshed. Appropriate solutions will vary from case to case and will often involve lengthy negotiations. The key to success is to keep the solutions as simple as possible, and to ensure transparency and accountability on the part of all those involved. In poor countries or communities, the need to devolve responsibility to the local level may sometimes be even more important than in wealthier communities. Experience shows that local communities are willing and able to organize effectively to provide basic urban services (a reliable drinking water supply, basic sanitation, solid waste collection, and so on) at affordable cost and in a sustainable manner, if municipalities or higher-level government authorities provide appropriate incentives.

Set goals and objectives at a national level, but allow local flexibility in implementation.

The notion of a “level playing field” within a country has a very strong intuitive appeal to both

environmental policymakers and those whom they regulate. Yet common sense tells us that any attempt to enforce uniform environmental policies throughout large, diverse countries will be doomed to failure. Indeed, the whole point of decentralization is to permit different policy responses to differences in priorities and problems. The dilemma is usually resolved by establishing a default or minimum set of incentives, standards, and other interventions. Default requirements apply wherever subnational authorities do not introduce explicit amendments, which may, subject to certain restrictions, be either stricter or more relaxed than the defaults. Minimum requirements imply that no subnational authority is permitted to adopt less demanding policies—although, in practice, such variation may occur as a result of differences in enforcement behavior. The extent of such default or minimum requirements varies greatly across countries, but everywhere they tend to include measures for dealing with the most sensitive environmental issues. In all countries, it will be the responsibility of national authorities to propose and broker agreements on the extent and nature of such core requirements.

Adapt Solutions to Circumstances

Identify the target group: is it the top third or the bottom third?

The reality that good management is a necessary condition for good environmental performance poses a dilemma in devising environmental policies. One option is to focus on raising the standards of the best third of all polluters, hoping that the laggards will gradually improve by learning from the example of their peers. This strategy is most likely to be effective when competition and social pressure provide a stimulus for improvements in operational as well as environmental performance. Even then, progress tends to be limited for the worst third of plants, and the only solution may be to force them out of business.

The alternative option of setting minimum emission standards and concentrating on plants that fail to meet them tends to lead to an adversarial style of regulation. Often, this undermines attempts to encourage the better plants to improve their performance. Few agencies have the resources or political support to enforce emis-

sion standards strictly for more than a limited number of plants at a time, especially if frequent monitoring of operational performance is required. As a result, reducing emissions from the worst plants may be a lengthy process with much backsliding.

Define targets, not solutions, with an emphasis on operational practices and good housekeeping.

At the level of enterprises and plants, the emphasis must shift to environmental performance viewed as one dimension of overall operational efficiency and quality management. The objective should be the consistent attainment of targets and, over time, the progressive reduction of emissions that are linked to important indicators of environmental quality. The focus of attention needs to be more on operational practices, good housekeeping, and the training of workers than on the technological and design specifications of pollution controls.

Make full use of compliance agreements as an essential tool in dealing with large polluters.

The achievement of environmental targets may start with the installation of new controls at the sources responsible for the most damaging emissions. This is accompanied by arrangements to monitor the effective operation of controls and to assess their impact on the critical indicators of environmental quality. Even such a straightforward scenario, however, allows ample scope for difficulties, ranging from disagreements about who should bear the costs to how the results of monitoring should be interpreted.

More typically, it will be necessary to negotiate with many sources, each of which—even with good will—will have many reasons to delay or modify the strategy proposed. The outcome will be some balance between (a) a bottom-up consensual approach in which agreements about targets for each source are laboriously reached on an individual or a collective basis (as in Japan or the Netherlands) and (b) a top-down approach based on some combination of emissions standards and economic incentives.

Use yardstick competition to improve environmental performance over time.

The nature of the relationship between environmental agencies and those regulated may mean

that the best approach is a combination of minimum requirements and market incentives. In such cases, it is critical that the minimum requirements be adjusted regularly (as part of a transparent permit system) to reflect the average performance of enterprises, rather than being determined by technical criteria. The goal would be a system of regulation based on yardstick competition, which has the desirable property of encouraging a continuous search for cost-effective improvements while penalizing laggards, perhaps heavily.

Prevention is often less expensive than after-the-fact measures.

For the same environmental benefits, retrofitting existing plant has been found to be three to five times as expensive as up-front measures. The latter include implementing appropriate technologies at the outset, applying simple yet effective maintenance, and setting up monitoring systems to ensure good performance and management.

Promote Good Management

Internalize environmental management.

Significant and lasting environmental improvements will not come until the objectives and requirements of environmental protection are internalized in the behavior of polluters, whether these be enterprises, organizations, or individuals.

Rely on incentives—both financial and social—wherever possible.

Pollution control policies have relied heavily on technological standards. Even where these standards are effective, they tend to be an expensive way of meeting environmental goals. Market incentives that reward good environmental management offer an alternative strategy, but they may be resisted on grounds of fairness and because of uncertainty about the level of reduction of total emissions. In practice, any differences between policies based on standards and those based on incentives are not large for particular industries or sources. The real advantage of relying on incentives lies in their flexibility and cost savings when emissions from many industries and sources have to be reduced. Incentives need not be financial; the provision of information and

public participation can have a significant impact on the behavior of some polluters.

Recognize that "win-win" options are not costless when management is the critical constraint.

The adoption of "win-win" options such as cleaner production techniques, waste minimization, and energy efficiency seems to offer the prospect of environmental improvement at little or no cost. Yet diffusion of such practices is often frustratingly slow, and the resulting benefits are modest. The problem, once again, is one of management capacity. The enterprises best placed to adopt and benefit from many "win-win" opportunities are likely to be among those that already have the best environmental performance. The same management constraints and weaknesses that lead to poor performance mean that the costs of innovation are likely to be relatively high and the benefits low for laggards.

Improved management is the best "win-win" option, especially for small and medium-size enterprises.

It is helpful to think in terms of two categories of enterprise:

- *Large enterprises* that tend to produce differentiated products, possess ample management and technical skills, enjoy access to world as well as domestic markets, and have a time horizon for their business decisions of at least five years. Because the quality of their products is often a central aspect of their competitive strategy, these enterprises are concerned to build up and maintain a reputation for reliability and high standards. Achieving and maintaining such a reputation means that managers are used to focusing on the good housekeeping aspects of production that are characteristic of many "win-win" opportunities. Of necessity, they have learned and adopted some or all of the precepts of good management outlined above. Thus, good environmental performance simply becomes another dimension of the continuous process of implementing efficiency and quality improvements that is required to compete on quality of output as well as on price.
- *Small and medium-size enterprises* that typically produce undifferentiated products and services for local or domestic markets, with very

limited management and technical resources, short time horizons, and little experience of how to upgrade the quality and efficiency of their production. Simple survival may be their primary concern, so that they tend to be risk averse when it comes to changing their operating methods. While the quality of their output may influence their customers, they tend to compete primarily on price. The painstaking process of building up a reputation for high quality is usually beyond both their resources and their time horizon. Few of the conditions that promote the adoption of good management practices apply, and the firms' environmental performance will reflect the general weaknesses of their management and operational practice.

The contrasting circumstances of the enterprises in the two groups highlight the fact that what may appear to be a clear "win-win" opportunity to an outsider may prompt very different responses from different enterprises. Still, it should not be assumed that even the most sophisticated firms in the first group will easily or rapidly adopt many "win-win" opportunities. For many, the economic gains may simply be too small to justify the bother, unless there are other incentives. Improved management capacity in small and medium-size enterprises will yield substantial benefits, and assistance toward this end will result in financial and environmental rewards—provided that assistance does not simply compensate for poor management actions in the past.

In other words, technical solutions to improve efficiency and environmental performance should come as a result of management decisions, not be a substitute for them. This implies that subsidies to promote cleaner production—in the form of grants for hardware or of centers which provide technical advice—will rarely achieve their intended purpose. However, demonstration projects that serve as concrete examples may provide useful lessons for enterprises that do not want to be the first to try new approaches.

Recognize that privatization or corporatization is often the best and only solution to the environmental problems of state-owned enterprises.

Experience suggests that the environmental per-

formance of state-owned enterprises is often worse than that of privately operated enterprises or, at least, of state-owned enterprises operated on a commercially independent basis. Rectifying this situation depends on fundamental changes in incentives and on the resolution of conflicting objectives among those responsible for supervising such enterprises. Privatization (or at least full corporatization) is almost always the best and often the only way of addressing the problems. Nonetheless, privatization is no panacea.

Careful consideration must be given to the environmental obligations to be met by privatized enterprises, especially where these enterprises are responsible for providing environmental services. The most important requirement is that a clear plan for achieving environmental objectives in the most cost-effective manner (e.g., in a river basin context) must be a required part of the bidding process prior to privatization. The successful bidder must then also be given the responsibility for making all the long-term infrastructure decisions necessary to meet the environmental objectives agreed at the outset.

Reward Good Behavior? Penalize Bad Behavior?

Money is often not the limiting factor.

Our understanding of what is required to improve the environmental behavior of utilities and enterprises is changing. It had been generally assumed that violations of regulations occur because of lack of resources to invest in pollution control. Increasingly, it is accepted that reality is more complicated. Often, investments to comply with regulations are often made, but controls are then switched off or bypassed, or poor plant management negates whatever pollution control measures may have been put in place. The question is, therefore, whether improvements in environmental performance really depend on investments in pollution control.

To what extent should pollution abatement be subsidized? Are lines of credit an effective mechanism for reducing pollution? Who should finance investments by public authorities? Experience with a broad range of projects throughout the world suggests the following answers.

In general, governments should not subsidize investments in pollution abatement by profitable enterprises. The "polluter pays" principle is clearly applicable, and the incentive effects of such subsidies are almost wholly undesirable. Any exceptions to this broad precept must rest on the existence of unusual and very specific external benefits. Lack of commitment or of effective regulatory oversight merely strengthens the case for not providing subsidies, since it implies that the resources will almost certainly be wasted.

Improve financial performance and operational management.

Unprofitable state-owned enterprises face many problems of more importance (to their managements) than their environmental performance. The best way of solving their environmental problems is through improvements in their financial performance and operational management. Subsidies, low-interest credits, and any other assistance will do nothing to change this harsh reality and will just be throwing good money after bad. The advice to such enterprises must be to straighten out their overall performance and then focus on environmental concerns, which will already be lessened because of the benefits of better operational practices.

Lines of credit for industrial pollution abatement are rarely an effective way of promoting better pollution management. The beneficiaries tend to be large enterprises with access to other sources of credit. For such recipients, finance is not the critical constraint in implementing effective measures to reduce pollution. Small and medium-size enterprises may face more serious financial constraints, but these pale by comparison with the problems caused by lack of commitment to good environmental performance and by limited managerial or technical capacity. It is better to allocate resources to outreach, training, and technical assistance activities than to provide privileged access to finance. There are circumstances in which a targeted (unsubsidized) line of credit may be a useful and justifiable complement to a broad action program implementing a package of measures that includes real incentives and effective regulatory intervention. However, most general lines of credit simply represent the triumph of hope over experience.

Users of the services provided by public utilities should be expected to pay prices that are sufficient to cover any investment costs involved. It may be sensible and efficient for such agencies to draw on a general public investment pool, but the objective should be to ensure that they have individual access to financial markets as high-quality borrowers. Investments in pollution controls should be financed either by borrowing or by the use of depreciation funds, not out of current revenues from taxes or service charges. If utilities find that they may be unable to recoup the borrowing costs by increasing service charges, there is a question as to whether the investments are really justified.

Close down or privatize industrial dinosaurs; don't use environmental concerns as an excuse for restructuring.

The argument for subsidies appears especially strong for industrial dinosaurs, handicapped by an inheritance of outdated capital equipment, excess labor, and poor operational practices. However, such subsidies are likely to be misdirected to investment in new equipment, whereas improvements in operational performance and good housekeeping would bring about efficiency as well as environmental gains. The remedy for both the economic and the environmental problems of such plants is either privatization or closure. Environmental concerns should not be used as an excuse to defer or divert necessary measures to implement appropriate actions, nor should the enterprises be exempt from the regular requirements of environmental policies.

Set requirements for old plants that reflect their economic life.

To the extent that exceptions are made to this general rule, the implicit payback period for any expenditures, taking account of both economic and environmental benefits, should be very short—not more than two years. This criterion will minimize the danger of financing redundant or wasteful measures to achieve goals that might be better met in some other way. Providing finance for projects that produce such rapid and large benefits should not delay any move to privatize the enterprise, and little will be lost if a decision is made to close all or parts of the plants concerned.

Box 2. Management of Industrial Pollution: Suggestions for Enterprises, Governments, and External Donors

Enterprises

- Good environmental practice is just good management; environmental problems are often a symptom of inefficiency and waste of resources.
- Focus on plant housekeeping, maintenance, and management. Would you sit on your plant floor? If not, why not, and what can you do about it?
- Involve your staff and workers. Environmental problems are often occupational health problems. Define clear goals, provide training, and monitor performance.
- Focus on those environmental investments that can be financed out of cash flow. This ensures that environmental management is seen as part of the overall operating costs of the enterprise.

Governments

- Identify critical problems, and focus political, human, and financial resources on priorities. This will ensure that the greatest impact will be made on the most important problems.
- Get the external incentives for enterprises right. Decisions on taxes and the like may be more important than environmental regulations. Don't neglect pollution charges. Ministries of finance should think of taxes as a way of changing behavior, not just generating revenues. Get all ministries to follow consistent policies.

- Be realistic in drawing up environmental regulations. Pure coercion has not worked and will not work. Negotiate realistic targets with industries and plants; then insist that these targets be met. Allow adequate time for compliance.
- Strengthen environmental agencies; develop their technical and monitoring capabilities; encourage them to understand industries. Provide advice as well as enforce permits. Decentralize responsibility to regional authorities wherever possible.

External donors

- Focus on those issues where well-directed efforts can accelerate change. Broad environmental progress will come largely as a result of economic change.
- Massive new investment may not be the solution; it may add to the problem. The pursuit of investment projects may distract management attention from smaller but practical improvements and goals. Investment projects should be the reward for better management, not an incentive to attempt to bring it about.
- Avoid soft loans to enterprises (as distinguished from national governments). Apply strict economic criteria in assessing projects. Grants may have a role where there are large external benefits that cannot be achieved by other means.
- Ensure that consultant studies and technical assistance have clear objectives and are directed toward specific needs of enterprises or governments.

Recognize the need for reasonable transition arrangements. Concerns about fairness are valid, but only if a fair outcome is seen as one that imposes uniform obligations—emission reductions or control technologies—on all sources. Any focus on environmental management must emphasize opportunities rather than obligations. Initial differences in capital equipment, age of plant, and the like that give rise to different opportunities decay as managers respond to the new policy framework. Thus, fairness only requires adequate transitional arrangements, not a permanent commitment to inappropriate policy instruments.

Mainstream Environmental Concerns

The broad concepts of sustainable development are now universally accepted. In practical terms, the challenge is to find ways to integrate pollution prevention and abatement into the ways that cities are run, enterprises are managed, and people lead their daily lives. The emphasis must now be on making environmental management and performance part of the basic criteria by which the success of any operation or process is measured. A number of practical suggestions are summarized in Box 2.