POLICY IMPLICATIONS

The main purpose of this report is to assist the looth" Congress with its deliberations about waste reduction. In this section the important conclusions of the first three sections of this report are drawn together to identify and analyze four critical policy choices on waste reduction:

1. Is there a need for legislative action?
2. Are there advantages to a completely new type of legislation?
3. What could new waste reduction legislation include?
4. What might be an effective level and source of funding?

Is There a Need for Legislative Action?

A significant body of waste reduction literature now exists extending beyond the EPA and OTA reports. Waste reduction is seen by nearly everyone as:

- offering substantial environmental and competitiveness benefits;
- an option that is technically, economically, and organizationally feasible in the near term and that has many opportunities yet available;
- not being amenable to a traditional prescriptive regulatory approach where the government tells industry what to do and when to do it; and
- as facing diverse obstacles in both government and industry.

The findings and conclusions of the EPA report to Congress on waste minimization are consistent with all of the above statements. Without a congressional directive to do otherwise, however, EPA plans limited activities, no institutional or organizational change, and very low funding. This course is consistent with a historical low priority and support for waste reduction and EPA's optimism about the positive effects of its regulatory programs on waste reduction. EPA's proposed small effort would probably not alter substantially the incremental increases in waste reduction now occurring. In the meantime, within the next few years actions and investments may occur that could displace waste reduction actions.

Congress itself caused a major reexamination of waste management and set the stage for this scenario through some of the 1984 Amendments to RCRA (HSWA). It directed EPA to move the Nation's hazardous waste management system away from land disposal with very strong mandates to EPA to examine, regulate, and promote alternative waste *management* technologies, such as incineration. The move to widespread incineration is occurring despite the unknown environmental risk that may follow. At the same time, Congress has not given explicit instructions for comparable measures to move industry to waste reduction, even though national policy states that waste reduction is the preferred environmental option. EPA only considers the availability of waste treatment capacity—not waste reduction potential—in reaching decisions on land disposal bans, including whether to delay the bans. This situation probably developed because of concerns about intrusive regulations to encourage reexamination of and change in upstream processes and operations in industry. Indeed, such concerns are warranted, but would not apply with a nonregulatory Federal waste reduction program. This approach was not considered when Congress reauthorized RCRA in 1984.

Superfund was similarly changed in 1986 without considering the potential benefits of reducing the generation of hazardous waste. Section 104(k) of the Superfund Amendments and Reauthorization Act of 1986 exerts pressure on States to assure the availability of hazardous waste treatment or disposal facilities to handle all hazardous wastes expected to be generated within the State during the next 20 years. Again, Congress did not require examination of waste reduction as a way to help create a comprehensive waste management system. However, there is now some discussion of using capacity credits to recognize State waste reduc-

tion programs.[54] This is a worthwhile way to integrate waste reduction into assessments of hazardous waste management capacity needs.

The ultimate decision not to use a waste-end tax to help fund the Superfund program may also be significant. That option had received considerable analysis, discussion, and support over some years.[55] Several States have large hazardous waste taxes or fees. One of the intended benefits of imposing a substantial tax on hazardous waste sent to land disposal and perhaps even waste treatment facilities is the promotion of waste reduction. For example, Judith Enck, the Executive Director of Environmental Planning Lobby in New York, said:

> Increasing regulatory fees is one way to encourage source reduction, for instance. I think getting companies to reduce the amount of toxic waste they generate out of the goodness of their heart isn't going to happen, If they can be convinced on economic grounds that reducing the amount of toxic waste that is generated is in their interest, they'll come around. I think the whole key is economics. so

Proponents of waste reduction have seen the decision to not use a Federal waste-end tax as a lack of interest in and support for waste reduction.

Moreover, there is rapidly increasing interest in waste reduction within the Nation's grassroots, citizen-based environmental movement that merits attention. People concerned about hazardous waste and environmental pollution are not concerned with statutory and regulatory subtleties. They focus on goals and results and recognize waste reduction's unique ability to offer the most certain and broadly defined environmental and public health protection. Such a preventive approach could extend beyond RCRA industrial waste to household hazardous waste and even to the elimination of hazardous materials in products. To these groups, lack of action on waste reduction signals a difficulty in moving incrementally toward a society with minimal use of and exposure to toxic and hazardous substances. s'

The EPA report concluded that enough information was available to say that much waste reduction has already occurred but that not enough information was available to make a decision on imposing waste minimization regulations on industry, Meanwhile, the report recommended some type of waste minimization technical assistance. The likely result of EPA's proposed program is a continuation of a slow increase in the reduction of the generation of hazardous waste; too slow to prevent a potential major shortage in waste management capacity, if it is going to occur. This development could cause the government to back away from its goal of greatly restricting land disposal.

The OTA report to Congress offers a range of broad policy approaches grouped according to probable outcome. It identified and discussed abroad range of obstacles that exist in both government and industry which block many companies from examining and thoroughly implementing waste reduction. These obstacles explain why a bold Federal nonregulatory initiative is necessary if the United States is to gain the environmental and competitiveness benefits of waste reduction in the near term. If Congress wants to increase the pace and scope of industrial waste reduction, where hazardous waste is defined in the broadest terms, it could adopt a strategy that would establish a strong Federal nonregulatory program that would not burden industry. **Waste reduction will proceed even without a major program at the Federal level, but slowly. Some companies may stop reducing the generation of waste after the easiest, most obvious ways are adopted. Others may not discover the benefits of waste reduction for some time.**

[54] See, for instance, "Development of State Capacity Certification Requirements under the Superfund Amendments and Reauthorization Act of 1986 (SARA), " draft prepared by the Center for Policy Research of the National Governor's Association, Mar. 15, 1987.

[55] See, for instance, U.S. Congress, Office of Technology Assessment, *Superfund Strategy,* OTA-ITE-252 [Washington, DC: U.S. Government Printing Office, April 1985).

[56] *Toxics in Your Community Coalition Newsletter,* February/March 1987, p. 5.

[57] One major national organization, the National Campaign Against Toxic Hazards, has already designed model legislation addressing this broader view of toxics use reduction that includes waste reduction. It has been introduced in several States.

Information and analysis from EPA, OTA, and several other studies now available to Congress could support a decision to move ahead with a nonregulatory legislative initiative focused on waste reduction instead of waste minimization, as defined by HSWA. The timing of government action is just as important as its nature. Even though waste reduction is a major change in strategy and thinking, it is also a logical and immediately available next step in the development of a comprehensive environmental protection-waste management system. Waste reduction combines the environmentalism of the 1960s with the economic sensibilities of the 1980s.

Are There Advantages to a Completely New Type of Legislation?

A decision to act legislatively on waste reduction would require a critical choice whether to act within the framework already existing under RCRA, the only environmental statute that has focused some attention on waste reduction, or to establish an entirely new statute.

The following reasons support new legislation:

1. **First and foremost, waste reduction is upstream pollution prevention that is different technically and philosophically from the end-of-pipe pollution control basis of existing statutes.** Almost all of the governmental and industrial apparatus established over many years for environmental protection depend on strategies, technologies, principles, policies, and environmental specialists that are not appropriate for waste reduction.
2. **Tacking waste reduction onto existing legislation, such as RCRA, has not resulted in waste reduction receiving priority.** It has not been defined clearly nor given focus in contrast to waste treatment options. (See figure 2 for an example of how the current regulatory system shifts pollutants among media compounding environmental problems and increasing costs to both government and industry.) waste reduction and even waste minimization are often ignored

Figure 2.—End-of-Pipe Approach: Regulating the Regulations

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part SO

[AD-FRL-3163-61

Standards of Performance for New Stationary Sources VOC From Petroleum Refinery Wastewater systems

AGENCY Environmental Protection Agency **(EPA).**

ACTION: Proposed rule and notice of public hearing.

SUMMARY: The **proposed standards would limit emissons of volatile organic compounds (WC) from new, modified, and reconstructed refinery wastewater systems. The proposed standards implement section 111 of the Clean Air Act and are based on the Administrator's determination that VOC emissions from petroleum refinery fugitive emission sources cause, or contribute significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare. Refinery wastewater systems are part of the refinery fugitive sources category. The intent is to require new, modified, and reconstructed refinery wastewater systems to control emissions to the level achievable by the best demonstrated system of continuous emission reduction, considering costs, nonair quality health, and environmental and energy impacts,**

A public hearing will be **held, if requested, to provide interested parties an opportunity for oral presentations of data. views, or arguments concernin, the proposed standards.**

This example of a proposed regulation shows how controlling, rather than reducing, pollutants can shift pollutants around and become an unending process. In this instance, the petroleum industry was initially required under the Clean Water Act to build wastewater treatment facilities to treat oily water from its refinery process units rather than release the untreated water into the Nation's waterways. Subsequently, it has been discovered that the treatment processes emit volatile organic compounds (VOCs) into the air, and now the VOCs must, in turn, be controlled. Thus, EPA is proposing that new, modified, and reconstructed refinery wastewater systems regulated under the Clean Water Act be further regulated under the Clean Air Act section 111. This proposal will not control those VOCs emitted from *existing* **wastewater systems.**

A *waste* **reduction approach would have been to conduct waste audits of the various refinery processes that generate the oily wastewater and to devise methods of reducing that generation. Many waste reduction case studies have shown that substantial amounts of wastewater produced from process cleaning operations can be reduced by relatively simple changes in those operations. By not generating the oily wastewaters, the VOC problem would not exist and require subsequent attention.**

SOURCE: Federal Register, vol. 52, No. 65, May 4, 1987, p. 16334.

when the RCRA program is examined. The linkage between waste reduction and what many people regard as higher RCRA priorities (e. g., enforcement and compliance issues) is rarely considered. Moreover, should Congress assign a substantial waste reduction program to the Office of Solid Waste (OSW), which implements RCRA, it is likely either that OSW's priority for treatment and disposal programs would interfere with its implementation of waste reduction or that current programs would suffer.

3. **Waste reduction must address all hazardous wastes and environmental pollutants or opportunities will open up to shift waste between environmental media.** While it is possible to superimpose waste reduction without conflict on the various environmental programs, it could be difficult to incorporate a multimedia approach solely from within RCRA or any other existing environmental statute. No matter what might make technical and economic sense, if the government said that waste reduction only applied to a narrow class of regulated waste, then much of industry's actions might be similarly focused. The temptation, and perhaps legal need, to address waste reduction comparably among all major environmental statutes would probably delay action.
4. **Waste reduction is best addressed by government policies aimed at assistance, persuasion, and institutional commitment.** Both EPA and OTA have said it is not amenable to traditional regulatory or prescriptive approaches. This is in stark contrast to existing environmental statutes which rely, almost exclusively, on command-and-control regulations. The success of the Ventura County waste reduction program supports the use of technical assistance.
5. **waste reduction bridges the environmental and industrial competitiveness areas of national concern.** The traditional regulatory approach to environmental protection results in increasing costs to government and industry. Waste reduction offers both government and industry a near-term opportunity to reduce their environmental costs and liabilities even as the government finds it necessary to promulgate more environmental regulations.

Reasons for maintaining the RCRA context for a congressional initiative on waste reduction include:

1. Congress can more easily amend an existing statute than create a new one;
2. RCRA, which has already dealt with the subject of waste reduction, is a timely vehicle since it is scheduled for reauthorization in 1988; and
3. RCRA involves fewer committees and subcommittee whereas a waste reduction statute might result in shared jurisdiction with committees with an interest in industrial competitiveness.

Overall, it would seem more effective and efficient for Congress to use new legislation if it chooses to move ahead with a major waste reduction initiative. However, a more modest initiative similar to what now exists could fit into the RCRA framework.

What Could New Waste Reduction Legislation Include?

There are a host of potentially effective policy instruments for Congress to consider.

Assistance to Industry

The environmental and economic benefits of waste reduction can be used to justify technical assistance by government to industry. Such actions by government include:

- **In-plant technical assistance** to deal with site-specific situations. Experts could provide help to identify waste reduction opportunities and techniques, establish waste reduction audit and accounting systems, and suggest organizational changes that foster waste reduction.
- **Information and technology transfer** through passive databases and catalogs of case studies and interactive (expert system)

databases. These would make relevant waste reduction data and information available to plant personnel nationwide.
- **Development and in-plant use of education and training** activities that help build waste reduction expertise among production people.
- **Generic R&D on commonly used processes and materials** that can assist many generators across different industries.

These efforts address existing obstacles in both government and industry and constitute purposeful incentives for waste reduction. They could be funded in part by the Federal Government and implemented mostly through State governments with the help of Federal grants. OTA found that State agencies and other parties close to industrial facilities can more efficiently and effectively implement such an assistance program than can EPA. **Existing State and sometimes local waste reduction programs are a nucleus on which to build a national program.** Their focus on waste reduction and their effectiveness could be rapidly increased through Federal assistance and a common definition, method of measurement, and policy framework.

In January 1987, North Carolina researchers conducted a survey of 50 States. The results on siting hazardous waste management facilities support OTA's findings about the need to stimulate more State activity on waste reduction. Although OTA found only 10 State programs with any focus on waste reduction, this survey revealed that 28 States believe that they have a "statutory mandate or program to encourage nonsiting alternatives, such as waste reduction at the source. "[58] However, when regulatory officials were asked "How much effect do you expect waste reduction measures will have in reducing the need for future siting of facilities?" only 21 States said moderate to significant, 22 said none to very little, and 7 didn't know. This result seems an outcome of: 1) minimally funded State and Federal programs designed to focus on waste reduction, and 2) studies that have often underestimated future waste reduction potential (discussed in detail in the OTA waste reduction report). A Federal grants program to States, therefore, could make waste reduction an ally of siting efforts by reducing siting needs in the near term to publicly acceptable levels.

California has recognized this concept. It recently passed legislation to facilitate the siting and permitting of hazardous waste facilities. Known as the Tanner process, it includes a provision for local governments to analyze waste reduction potential with the State Department of Health Services providing supporting waste reduction information. [59]

EPA Organization

Creating an Office of Waste Reduction with an Assistant Administrator in EPA would be a major change. Independence from existing EPA pollution control programs is key. This option takes on more importance because EPA has said that a nonregulatory waste reduction program requires institutional advocacy. Waste reduction is not a new idea, but past history also makes clear that if waste reduction is to achieve parity with pollution control as a major means to environmental protection, it must have organizational commitment, public visibility and accountability, and institutional advocacy at the highest levels. EPA is, like any other institution that deals with the environment, a member of the pollution control culture that has developed over 20 years in the United States. **If EPA is to implement an effective waste reduction program, its organization should reflect the primacy of waste reduction.** The lack of such organizational change has already caused waste reduction to be overshadowed by existing regulatory programs, as shown in figure 1.

A major new bureaucracy that would add to the administrative burdens of EPA would be unacceptable and unwise to many. In terms of

[58] Richard N.L. Andrews and Phillip Prete, "Trends in Hazardous Waste Facility Siting and Permitting," Workshop on Negotiating Hazardous Waste Facility Siting and Permitting Agreements, Conservation Foundation, Mar. 11-13, 1987. Emphasis in original.

[59] California State Assembly Bill 2948 (Tanner).

staff, budget, and responsibilities, however, an Office of Waste Reduction would always be a small part of EPA. A nonregulatory program would not have the kinds of responsibilities that define most of EPA's operations. The issue is not one of size but of providing unambiguous institutional commitment to a worthy objective. **With people committed to waste reduction and expert about industrial production, even a small office can supply critically needed national leadership.** A waste reduction program that is submerged within EPA is not likely to have credibility with industry and the public, An Assistant Administrator can explain and promote not only EPA's waste reduction effort but that of the entire Federal Government and of State programs, **Currently, although EPA participates in many conferences and workshops conducted on waste reduction, no senior EPA official represents the agency, is a visible advocate of waste reduction, or is attempting to unite national interest in waste reduction.**

Even though EPA has only a small effort on waste minimization, a lack of coordination and consistency among different groups has already surfaced. EPA itself noted that: "Some waste minimization options may require extensive internal cooperation among EPA programs. "[60] There have already been significant differences among the Office of Solid Waste, the Office of Research and Development, and the Office of Policy Planning and Evaluation that help explain the inconsistencies and ambiguities of EPA's report to Congress on waste minimization. Both ORD and OSW seem to acknowledge the primacy of waste reduction over regulated pollution control activities more than does EPA's policy office. These internal tensions may explain the small fiscal year 1988 budget request for waste minimization that is inconsistent with EPA's report. **With the almost inevitable increase in interest in waste reduction, bureaucratic problems are likely to get worse in the absence of a central EPA office with overall responsibility for waste reduction.**

The activities that an EPA Office of Waste Reduction might undertake to shift the balance between the use of waste reduction and traditional pollution control in industry are many and varied. They are summarized below in order of decreasing priority and need, amplifying the discussion in the OTA report:

- **National Leadership:** A key function of the office would be the administration of waste reduction grants to the States. Emphasis could be placed on expanding existing programs that have shown effectiveness and providing seed money for new programs, setting necessary policies and criteria for selection and funding (including perhaps assisting the formation of State waste reduction boards), establishing standard methods of measurement and a standard definition of waste reduction to focus State actions,[61] evaluating the performance of funded programs, and transferring successful ideas among State programs. The chief objective would be to develop and implement a cost-effective national support system for very large numbers of waste generators (i.e., many tens of thousands).
- **Information Analysis:** The establishment and operation of a national waste reduction database would make it possible to assess progress nationwide. Annual reports could provide information on whether voluntary goals established by Congress are being met nationwide and across all industries and analyze unsatisfactory results. Industry waste reduction plans could be analyzed to see if sufficient commitments are being made to meet national goals. Gross waste generation and environmental spend-

[60] U. S. Environment] Protection Agency, *Report to Congress: Minimization of Hazardous Waste,* op. cit., p, 89.

[61] BIA need for a standard definition to focus implementation is made clear by a recent example from New York State. An April 1987 staff report of the Joint Legislative Commission on Toxic Substances and Hazardous Wastes, "Hazardous Waste Reduction: Obstacles and Incentives, " contains a clear definition of *waste reduction* that is consistent with OTA's definition and discusses the need to address obstacles to increase waste reduction in the State. Several bills have been introduced in the State legislature as a result of the report. One bill (S. 5192) sets waste reduction as the preferred hazardous waste option in New York, Two others (S. 5190 and S. 5191) establish loan guarantee and waste audit programs. Their stated purpose is to encourage waste reduction but the bills are inconsistent with the definition and priority given waste reduction, They allow appropriated waste reduction funds to be spent on recycling and treatment, options that can divert industry's attention from waste reduction,

ing data could be analyzed to detect whether waste reduction is having a positive impact on waste management nationwide. Use of information gathered from other EPA programs would also be examined.

- **Information Transfer:** Industry would be assisted, directly or through State programs, either by the establishment of an accessible database of technical information on waste reduction or by fostering nationwide use of an existing system. The office could design an expert system (i.e., an interactive computer system that provides answers to questions) to assist waste generators explore waste reduction options. Information would be obtained from the grants program and from past and ongoing technical activities outside the Federal effort. **Information transfer is not a substitute for in-plant technical assistance (provided by States) because the mere availability of information provides no certainty that a generator will obtain it and be able or willing to act on it effectively.** The first priority of this Federal information transfer effort would be to provide support for State (or even county) programs and secondly to assist individual companies.
- **Outreach:** A major obstacle to waste reduction is convincing **people** that it is a viable, near-term option. This obstacle would be overcome if the office played a lead role in outreach programs, such as workshops, to educate industry, regulatory officials, and the public at large about waste reduction. The office could also publicly recognize industries that practice waste reduction and encourage still more waste reduction by others. An ongoing, high level industry liaison group to provide major guidance to the office could be established. A similar liaison group for the educational community could promote the introduction of waste reduction principles into engineering and business management curricula. A third liaison group of the general public, environmental, public health, labor, and public interest groups would provide important input to the Federal program.
- **Regulatory Analysis:** Elements of the current environmental regulation system serve as obstacles to waste reduction but also sometimes move industry slowly in the direction of waste reduction. A critical need is to purposefully seek ways to use existing regulatory programs to promote waste reduction. For example, permits could be made contingent on explicit commitment to waste reduction. Such measures are not likely to be a high priority of regulatory programs. Independent expertise on waste reduction would be needed in any event. Regulations to force waste reduction in industry are a potential for the future. The office could analyze the impact of the current system on waste reduction, work closely with EPA's enforcement and regulatory programs to help define and analyze opportunities for regulatory concessions to ease the adoption of waste reduction, and study the feasibility of waste reduction regulations in case information should show that the nonregulatory efforts to promote waste reduction are not successful. By analyzing and reporting on the waste reduction impacts of regulatory actions within the formal regulatory activities of EPA, the office could prevent the creation of more obstacles to waste reduction. This should be a high priority of EPA, and the office could provide the necessary technical expertise and objectivity for this task. Bias for waste reduction from this office would, at the least, balance the existing bias for pollution control within current regulatory programs. (See box F for a current example; the agency's decisions on regulating industrial furnaces and boilers for burning hazardous waste).
- **Research and Development:** The office could provide and monitor funding to EPA's Office of Research and Development, as the current regulatory programs do, for waste reduction research identified as necessary to reduce significant amounts of waste. It could also disseminate R&D results from EPA and other sources to industry. R&D would also be possible through the State grants program.

- **Implementation of Related Federal Activities:** Congressionally mandated activities that relate mostly to waste reduction could be implemented by the office. An example is the information gathering aspects of the new Superfund program (Title III of SARA) having to do with crude mass balances of some industrial facilities. (Note, however, that these new data reporting requirements will not provide the government with a measure of national waste reduction because waste generation will be reported in several broad ranges only. Moreover, waste generation will not be reported in terms of production output. In addition, data on only some 300 chemicals from a fraction of industry are to be collected.) Another example is the Superfund requirement for State assurances for long-term hazardous waste treatment or disposal facilities of State wastes. Implementation will require an ability to review and assess such assurances and the analytical bases used. Waste reduction is a key variable that should be included in such State analysis.
- **Federal Government Coordination:** By working with other branches of the Federal Government, the office could promote and measure waste reduction at Federal facilities;[62] remove obstacles to waste reduction, such as inflexible procurement and product specification policies of the Department of Defense and the Food and Drug Administration that prevent waste reduction; and use waste reduction performance as a criterion to select vendors and contractors. Coordination with agencies such as the Department of Commerce could help to establish waste reduction as part of economic growth and industrial competitiveness.
- **Issue Development and Liaison:** Government has, for the most part, avoided the issue of toxic and dangerous materials in non-food and non-drug products. The office could play a lead role in EPA and work with other Federal agencies and the public on this issue and that of expanding waste reduction to solid waste (i. e., household and commercial garbage). Toxics use reduction is rapidly becoming a broadly supported concept.

As difficult as organizational change can be, creating an independent Office of Waste Reduction offers advantages over several other options and what the EPA report says has been a problem for the agency—the administration of nonregulatory programs. For example, an expanded waste reduction effort within EPA's Office of Solid Waste would face tough competition from existing OSW programs. Credibility would also be a problem, particularly for establishing a national database on waste reduction, since in 10 years OSW has not established a reliable database on RCRA waste generation. Establishing a separate waste reduction division within EPA's solid and hazardous waste program comparable to OSW would hamper developing a multimedia basis for waste reduction and, here too, would face very strong competition from existing hazardous waste management efforts. Creating a waste reduction effort within each major regulatory program (air, water, and waste) would also likely result in duplication of effort, overwhelming competition from existing regulatory programs, and great difficulties in achieving expeditious and consistent actions.

Another alternative, already receiving some attention within EPA, merits discussion. The Office of Research and Development (ORD) has shown increasing interest in waste reduction.[63]

[62] As in industry, the Department of Defense readily acknowledges that "the financial and legal incentives to reduce or entirely eliminate the generation of hazardous wastes are becoming more attractive. " However, it too uses waste minimization that includes waste treatment and also speaks of the need to reduce "volume or toxicity" of wastes, thus allowing actions that reduce volume and concentrate hazardous components. [Michael J. Carricato, et al., "Department of Defense Hazardous Waste Minimization, " *Proceedings of the National Conference on Hazardous Wastes and Hazardous Materials* (Silver Spring, MD: Hazardous Materials Control Research Institute, March *1987),* p. *328.]*

[63] As this special report was near completion, the Hazardous Waste Engineering Research Laboratory of ORD released a proposal in April 1987 to develop a program to "contribute to the reduction of technical barriers . . . impeding the adoption of waste minimization , . . " [U.S. Environmental Protection Agency, "Waste Minimization Strategy, " undated.] A funding level of about $3 million for 1988 has been discussed. The major shortcoming of the ORD proposal is a lack of attention to and support of in-plant technical assistance to increase the use of existing waste reduction information and technology.

There is undoubtedly a role for ORD in overseeing and carrying out waste reduction research and development and perhaps in the development and establishment of necessary central information systems, as discussed above. To have the EPA waste reduction activity centered in ORD, however, is not an effective way to overcome present obstacles to the use of waste reduction in industry. A program operated by ORD could not conduct a full range of activities and would not have the organizational stature of an agencywide Office of Waste Reduction. ORD has no experience in managing nonregulatory programs, such as in-plant technical assistance. Some problems and limitations of ORD taking the agency lead in waste reduction are:

- technology per se is not the limiting factor for more widespread industrial waste reduction and ORD has little experience in addressing nontechnical obstacles and problems;
- no study of waste reduction has revealed any particular need for a major government technology demonstration program for waste reduction;
- ORD would have difficulty in establishing credibility and effectiveness for a nonregulatory program aimed at assisting industry, because its experience is mainly in end-of-pipe pollution control, not in upstream manufacturing processes, and its work is mostly in support of regulatory programs; and
- there could be a tendency for ORD to carry out lengthy **studies on waste** reduction, rather than to actively assist industrial waste generators of all types to use existing technology through onsite technical assistance.

Reporting and Planning Requirements

Even though nonregulatory programs do not require extensive, detailed data to function, information on correctly measured waste reduction and the cost savings relative to pollution control is necessary. Eventually, EPA will have to evaluate the effectiveness of a Federal program and will need such data to do so.

One of the key obstacles to waste reduction within companies is that it is not usually a high priority with top management. Some people in industry are troubled by a policy option suggested in OTA's report that would compel publicly owned companies to inform investors, through reports filed with the Securities and Exchange Commission, of their waste reduction efforts and progress. It raises the spectre of yet another burdensome government requirement to gather more detailed information. However, that same information is necessary for companies to evaluate waste reduction possibilities and, in more detailed form, could be reported to EPA and serve useful purposes for national policy implementation and evaluation.

New industry reporting requirements—on past waste reduction actions and detailed plans for future efforts-is another policy option suggested by OTA that would require new legislation. *Government required plans could stimulate the kind of attention that would make waste reduction a commonly used option in industry. Plans must specify what actions generators will examine and take in the future to maintain the priority of waste reduction.*

However, reporting and planning requirements by themselves do not address lack of interest, poor information, and lack of technical resources to reduce waste. Nor would they be effective unless there was a standard way of measuring waste reduction based on the need to put changes in waste generation on a production output basis for specific processes and facilities. Without in-plant technical assistance and other active efforts by government and other organizations, a generator may be complacent or incorrectly assume that there are no additional waste reduction opportunities. Therefore, **reporting and planning requirements are best seen as but a part of a more comprehensive government program that identifies and removes obstacles to waste reduction and assists industry to reduce waste.** But reporting and planning requirements are important for government programs to assess progress and for motivating and maintaining the interest of generators.

Voluntary Goals

Another option, a 10 percent *year-to-year* voluntary goal over 5 years for waste reduction, has not been suggested as a surrogate or antecedent to regulatory requirements.[64] Setting goals would draw attention to waste reduction and provide a simple way to measure progress and justify actions.

Some are unconcerned about such a goal because they already use goals for the same reasons. Moreover, OTA arrived at an annual goal of 10 percent by using data from several companies that showed such a level of performance over the past few years.

Nevertheless, some people are nervous that voluntary goals might presage regulations and might penalize innovative and progressive companies that have already substantially reduced waste, Since the first waste reduction opportunities tend to be the cheapest and easiest, companies that have not adopted waste reduction could quickly make progress that might prove difficult for those with a long-standing commitment to waste reduction. However, companies whose commitment to waste reduction preceded the adoption of national goals would be able to show that they have already significantly reduced their generation of hazardous waste.

A Long-Term Option: Flexibility in the Regulatory System

Companies who pursue waste reduction beyond the first easy and inexpensive opportunities face increasing technical complexities and costs. The current regulatory system imposes costs and places demands on a company that can limit its resources for waste reduction. This may be a significant problem for large companies that generate and manage large amounts of waste onsite and therefore, can face substantial capital costs for pollution control facilities to comply with regulatory requirements. To address these two obstacles to continuing, comprehensive waste reduction, OTA presented the concept of regulatory concessions, an option that could be implemented in 3 to 5 years, rather than immediately.

Waste reduction might achieve more of its technical potential if flexibility were introduced into the current regulatory system. Trade-offs between pollution control regulatory requirements and specific waste reduction plans and actions could facilitate the expenditure of industrial resources on waste reduction, which provides more certain environmental protection and enhanced industrial competitiveness. Concessions, such as delayed regulatory compliance, would be granted only for projects that would provide a net gain in environmental protection and public health. Valid concerns arise about this policy creating opportunities to avoid or escape regulatory compliance. These concerns and ways to deal with them are discussed in the OTA report.[65]

In its study of environmental protection and technological change OECD came to important conclusions about regulatory flexibility:[66]

> . . . flexible enforcement of the regulations according to a time schedule and procedures negotiated between industry and government are largely responsible for the firm's technological reaction.
>
> A certain flexibility and adjustment to the special circumstances of each industry can pay in the long run.
>
> It is better to have regulations that are strict but flexibly enforced, than undemanding regulations hastily enforced.
>
> An exemption which allows industry sufficient time and latitude to develop new technologies is usually favorable for technological change. There may, however, be a conflict

[64] There has been some confusion over the 10 percent annual voluntary goal figure, Note that over *5* years a year-to-year 10 percent level of waste reduction, where each year's generation serves as the basis for the following year's goal, results in a total of 41 percent reduction relative to the amount generated at the start of the 5-year effort and 65 percent after 10 years. Because the base is declining, waste reduction in terms of amount of waste per unit of production output is declining also, This means that if production levels remain constant, progress seen as changes in the the total amount of waste generated slows down.

[65] Concessions are not a new idea. Both the Clean Water Act and the Clean Air Act have had such provisions; they are also discussed in the OTA report.

[66] Organization for Economic Cooperation and Development, *Environmental Policy and Technical Change,* **op. cit.**

between the desire to facilitate technical change [what OTA calls waste reduction] and the urgent need to protect the environment, which often means a conflict between urgent short-term measures and greater efficiency in the longer term.

OTA concludes that as difficult as it may be to introduce flexibility into the regulatory system, the long-term environmental and economic benefits of doing so may more than justify the attempt. As the earlier discussion of U.S. industry's relative competitive disadvantage showed, other nations seem to have done a better job of introducing regulatory flexibility. Historically, there have always been reasons for granting some U.S. companies regulatory concessions, but waste reduction may be the best reason.

A Long-Term Option: State Waste Reduction Boards

To deal with concerns about implementing regulatory concessions and **a** number of other **waste** reduction policies, OTA suggested that State waste reduction boards, similar **to exist**ing State hazardous waste siting and management boards, assess waste reduction benefits and work with regulatory agencies **on** regulatory concessions. State boards could also play a major role **in implementing any Federal grants program and could provide expert panels to help answer a key question: has a company already made a good faith, documented effort to reduce generation and does it have a plan to do more? Since the OTA report, the Michigan Toxic Substances Control Commission has recommended the creation of a State waste reduction board.[67] Some existing State waste management boards as well as some States' active divisions that focus on waste reduction could, of course, be alternatives to new organizations.**

[67]The Michigan Toxic Sustance Control Commission, "White Paper: Investigations and Recommendations for the Development of a Comprehensive Michigan Program in Hazardous Waste Reduction," prepared by Waste Systems Institute of Michigan, Inc., October 1986.

What Might Be an Effective Level and Source of Funding?

Even **at** the earliest stages of discussion about **waste** reduction programs, **current budget deficits make it necessary to deal with financing of a Federal waste reduction program. It is important to see a Federal waste reduction program as different from a traditional regulatory program. To overcome inertia and smooth a path from pollution control to pollution prevention** may *not* require major, long-term funding.

Considering the environmental priority of waste reduction, a small percent of the normal operating program budget of EPA might be reallocated to establish and operate an Office of Waste Reduction. As an example, 2 percent of EPA's fiscal year 1988 budget request of $1.5 billion (excluding Superfund, underground storage tanks trust fund, and construction grants programs) would provide $3o million for waste reduction.

A funding level of $3o million, achieved by a 2 percent **cut in all of EPA's existing programs and operations, would be small enough not to threaten the effectiveness of those other efforts. The cut might be across the board, or it might be made at the discretion of EPA, or Congress might direct that cuts be made in certain areas.**

This method of funding could generate $255 million for a 5-year program by increasing the figure to 3 percent in the second year and 4 percent ($60 million annually in terms of the fiscal year 1988 request) in the subsequent three years. This level of funding might seem too low in comparison to the benefits of expeditious and systematic waste reduction. However a new, separate Federal waste reduction program could encourage and assist in a national transformation carried out by industry and would not be an activity where the government has a major operational role. Thus, these figures are consistent with government action that stimulates widespread private actions in the public good.

Federal waste reduction grants to States probably would account for most (80 to 90 percent) of the money appropriated. EPA has said:

> . . . only the States have the close knowledge of local industry that would be necessary to **ensure successful implementation of non-regulatory programs.**[68]

This level of funding to States is equal to about 10 percent of current grants to States in pollution control regulatory programs. Yet it would provide about 10 times the money now being spent by some States on waste reduction, making a 10 percent matching fund requirement a feasible option. It would increase in-plant assistance from a tiny fraction of the Nation's waste generators to between 50,000 to 100,000 companies over five years. From the national perspective, spending $200 million for 5 years on State waste reduction grants could result in annual savings by industry of billions of dollars in avoided waste management costs.[69] As has been shown by a federally supported energy conservation technical assistance program, increased tax revenues from corporate profits resulting from waste management savings would likely be greater than the Federal cost of the waste reduction grants.[70] Thus, as with the energy conservation technical assistance program, Federal spending **on waste** reduction might pay for itself. Moreover, the savings from waste reduction **are more certain than from energy conservation because waste management costs increase steadily while energy costs sometimes decrease. Hence, increased tax revenues are more certain from a Federal waste reduction program.**

Spending for other than the State grants could be limited to $5 million to $10 million annually (including funding of ORD efforts), equivalent to about 10 to 20 fulltime equivalent (FTE) employees. This FTE level is consistent with the tasks described above for an Office of Waste Reduction.

The $255 million total for a 5-year waste reduction program to prevent pollution and, ultimately, the creation of more Superfund sites amounts to about 3 percent of the $8.5 billion that Congress has recently appropriated for the second 5-year Superfund program. Cleaning up a few major Superfund sites can cost several hundred million dollars. The Governor of New Jersey has recently made the connection between the role of government in waste reduction and cleanup costs, saying:

> **Right now we are spending billions on hazardous waste cleanup and on regulating the storage and handling of hazardous substances. Yet we don't spend anything on programs to reduce the production of waste in the first place.**[71]

New Jersey's recent initiatives to promote waste reduction include a proposal for fees on waste generation, creation of an information transfer program, and a review and revision of regulations that limit waste reduction.

Finally, 5 years of Federal grants might be enough. Once waste generators get direct technical assistance, overcome major obstacles, and learn how to implement waste reduction, they will know how beneficial waste reduction is to them, economically. After 5 years, a smaller Federal effort (e.g., $10 million annually or less than 1 percent of EPA's operating budget for

[68] U.S. Environment] Protection Agency, *Report to Congress: Minimization of Hazardous Waste,* op. cit., p. 124.

[69] This estimate is based on the 2-year experience of the Ventura Country waste reduction program, which cost the county **$1.50,000** and reduced hazardous wastes by an estimated 40,000 tons. Given land disposal costs of $250 per ton, for every dollar spent by Ventura County, its industry is saving $67 annually. An unknown portion of the initial savings was spent on one-time capital investments in waste reduction technology and processes. The estimated savings is conservative, however, since it is based on only reducing RCRA hazardous wastes and only those shipped offsite and does not account for other economic benefits that accrue from waste reduction such as avoided liabilities and energy and raw materials savings. These factors offset the fact that some wastes probably became treated onsite instead of being reduced or eliminated and the fact that some of the tonnage decrease came from cuts in industry production. A $10 billion annual savings nationwide would result from only about 10 percent waste reduction for RCRA wastes (50 million tons annual reduction). See also footnote 30.

[70] The Department of Energy's Energy Analysis and Diagnostic Centers, which offer similar in-plant technical assistance, have resulted in a federal government internal rate of return of 56 to 101 percent per year because manufacturers' savings become taxable incremental earnings. For every Federal dollar spent industry has saved over $5 annually, Despite the high positive revenue return to the Federal government, in 10 years the program has only managed to assist 1,750 plants because of its limited budget, which for fiscal year 1987 totals $1.5 million. [See the University City Science Center's "Energy Analysis and Diagnostic Centers Fact Sheet," January 1987.]

[71] Thomas *H.* Kean, *Annual Message to the New Jersey State Legislature,* Jan, 13, 1987, p. **23.**

nongrant activities including R&D) might be enough to ensure that waste reduction is pursued to its limits, incorporated into new industrial operations, and perhaps extended to municipal waste and consumer products. In the initial years, States will also learn how to run effective waste reduction programs that assist economic growth. An effective 5-year grants program, therefore, might permanently alter how American industry functions. It can be explicitly established as a seed program to demonstrate that waste reduction is an effective complement to our current regulatory system. The experiences of companies like 3M and Dow Chemical indicate that **once the waste** reduc**tion lesson is learned first-hand by production people, government can play a smaller role. EPA has said:**

> **One** critical benefit of technical **assistance is that it can be started immediately and can show at least some benefits within months of enactment.**[72]

OTA agrees, because limited State programs have started **to show** this. If technical **assistance is good, then should it not be made available to American industry nationwide as part of a major Federal effort to encourage waste reduction?**

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[72] U.S. Environmental Protection Agency, *Report to Congress: Minimization of Hazardous Waste,* op. cit., p. 117.