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An Executive Summary: 16 Air and Water Pollution Issues Facing the Nation. CED-78-148A; B-166506. October 11, 1978. 43 pp.

Report to the Congress; by Elmer B. Staats, Comptroller General.

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The following legislation was enacted in order to deal with air and water pollution nationwide: the Clean Air Act Amendments of 1970 and 1977 and the Federal Water Pollution Control Act Amendments of 1972 and 1977. Air quality legislation is intended to protect the public health and welfare from air pollution, and water quality legislation is meant to eliminate the discharge of pollutants and to have swimmable and fishable waters. Programs for achieving these goals have resulted in a cleaner environment, but billions have been spent to date on pollution controls; during the period from 1975 to 1984, about $423 billion may be spent by government and industry. Findings/Conclusions: In order to set priorities in achieving environmental goals, some basic questions must be answered, including: How much environmental protection is needed? When is it needed? What is the best way of obtaining it? What price is the Nation willing to pay? The goals of pollution control legislation are basically sound except for the goal to eliminate the discharge of pollutants into waterways. However, regulatory adjustments are needed to resolve certain major issues. Amendments to the legislation have addressed many of the issues. Among major issues to be considered are: energy development, conservation, and independence; environmental protection and improvement; economic growth and stability; economic efficiency and equity; public health and welfare; and inflation. Policies should be coordinated and issues should be considered as a whole rather than separately. Solutions should be sought for the total pollution problem rather than for some parts at the expense of others, but present pollution laws and programs do not usually allow for such tradeoffs. Sixteen major pollution control issues identified by GAO dealt with goals, standards, implementation,

requirements, monitoring, siting, grants management, planning, cost-benefit analysis, and alternatives. (H1W)

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BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

An Executive Summary: 16 Air And Water Pollution Issues Facing The Nation

Controlling air and water pollution could cost the Government and industry $423 billion from 1975 to 1984. Officials in the public and private sectors are raising questions such as:

How much environmental protection is needed?

When is it needed?

What is the best way of getting it?

What price is the Nation willing to pay?

With these thoughts in mind, GAO studied national air and water pollution control goals and strategies to determine strengths and weaknesses and to identify possible alternatives. During its study GAO identified 16 major environmental pollution issues, performed extensive fieldwork, expressed its view on each issue, and recommended congressional and agency action, where appropriate.

This document is the executive summary of the GAO report. The scope and detailed results of the full work are contained in a separate report which includes an appendix with case examples, technical papers, and other supporting material.

CED-78-148A
OCTOBER 11, 1978

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-166506

To the President of the Senate and the
Speaker of the House of Representatives

This report summarizes the results of our study of 16 air and water pollution issues and contains recommendations to the Congress and the Administrator of the Environmental Protection Agency.

We made our review pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

Copies of this report are being sent to the Administrator of the Environmental Protection Agency.

Comptroller General
of the United States

Contents

ABBREVIATIONS

EPA	Environmental Protection Agency
GAO	General Accounting Office
NCWQ	National Commission on Water Quality

I. INTRODUCTION

Federal policy has gradually developed to deal with air and water pollution nationwide, and has culminated in four comprehensive pieces of legislation--the Clean Air Act Amendments of 1970 and 1977 and the Federal Water Pollution Control Act Amendments of 1972 and 1977. This legislation substantially enlarged and strengthened the regulatory and subsidy parts of environmental policy and committed the Nation to ambitious goals for clean air and water.

Air quality legislation is to protect the public health and welfare from air pollution. Water quality legislation is to eliminate the discharge of pollutants and to have swimmable and fishable waters. Programs for achieving the goals of the clean air and water acts have resulted in a cleaner environment; billions have been spent to date on pollution controls, and during the 10-year period from 1975 to 1984 about $423 billion may be spent ($163 billion by government and $260 billion by industry). Consequently, there has been and will continue to be a downward trend in the volume of pollutants being discharged into air and water.

Air pollution control will require $175 billion; the remaining $248 billion of the projected $423 billion will be spent on water pollution control. Public and private investment is, respectively, $6 billion and $169 billion for air-pollution control and $158 billion and $90 billion for water pollution control.

The public and private sectors are becoming increasingly concerned about achieving environmental protection standards in terms of improved environmental quality and fund requirements. Recognizing that the demand for funds may surpass available resources, how can the Nation best identify its priorities to meet its many needs?

--How much environmental protection is needed?

--When is it needed?

--What is the best way of obtaining it?

--What price is the Nation willing to pay?

From those perspectives we studied the national air and water pollution control goals and strategies that have emerged over the past decade. Our objective was to determine strengths and weaknesses in pollution control programs and to identify possible alternative strategies that may be used to achieve air and water pollution control goals.

We believe that the goals of the clean air and water acts, except for the goal to eliminate the discharge of pollutants into waterways, are basically sound. However, regulatory adjustments are needed to resolve major issues that have emerged to continue progress in achieving air and water quality goals in the most cost-effective, efficient, and equitable manner consistent with other national priorities--particularly energy issues. The Congress amended the Clean Air Act in August 1977 and the Federal Water Pollution Control Act in December 1977. These amendments address many of the issues we examined, and in some cases the amendments resolved them. We therefore analyzed the effects the amendments had on our proposed conclusions and recommendations and made appropriate modifications.

The conversion and direct and indirect consumption of energy are major contributors to air and water pollution. Thus, energy and environmental policies are inextricably joined; but it is not clear that this has yet been adequately recognized, either legislatively or institutionally. This has resulted in environmental legislation that increases energy consumption (as with early air pollution controls on automobiles) and energy legislation that sometimes improves or adversely affects the environment--examples are legislation to improve automobile efficiency that also significantly reduces unwanted emissions and the conversion of industrial facilities to coal (which reduces air quality).

It is beyond the scope of this study to analyze the relations of U.S. energy and environmental policies and programs, and make recommendations for improving coordination and comprehensiveness. However, we feel compelled to bring to the attention of the Congress the need for coordination of policies and programs and to stress that a number of recent energy policies exist which have superseded earlier environmental actions to a great extent. In brief, the Nation is facing a number of issues that should be considered as a whole, rather than separately, as is presently being done. These include at least:

--Energy development, conservation, and independence.

--Environmental protection and improvement.

--Economic growth and stability.

--Economic efficiency and equity.

--Public health and welfare.

--Inflation.

We also believe that the Congress should begin examining comprehensive ways to solve the total pollution problem rather than solving a part at the expense of the whole. Air and water pollution control laws require dischargers to install facilities that capture and concentrate pollutants which must then be disposed into the air, water, or land. Unfortunately, air and water pollution laws and programs have such rigid single-purpose control requirements that pollution control tradeoffs among air, water, and land are not usually considered.

We identified 16 major environmental pollution abatement issues in this study, performed extensive fieldwork, expressed our views, and recommended resolutions. There are other valid views on the issues. But for each issue we based our view on an independent, objective analysis of facts and opinions. Where appropriate, recommendations stemming from our anlaysis were made. We obtained comments from the Environmental Protection Agency (EPA) on our draft report; these comments are reflected in the final report. (See app. I of main report.) The 16 major issues are listed on the next page.

The scope and detailed results of our work are contained in a separate report, "16 Air and Water Pollution Issues Facing the Nation." The report (CED-78-148B, the main report) includes an appendix with case examples, technical papers, and other supporting material. Instructions for obtaining the main report and appendix are shown on the inside back cover of this Executive Summary.

16 MAJOR AIR AND WATER POLLUTION ISSUES

Issue	Subject	Area
1	GOALS AND TIMETABLES-- Should They Be Changed?	
2	AMBIENT AIR QUALITY STANDARDS-- Do They Need Refinement?	
3	STATE IMPLEMENTATION PLANS-- Are They an Effective Implementing Mechanism?	Air
4	AUTOMOBILE EMISSION REQUIREMENTS-- Should They Be Revised?	
5	TRANSPORTATION CONTROL PLANS-- Are They Feasible or Beneficial?	Quality
6	SULFUR DIOXIDE-- Should It Be Continuously Controlled?	
7	PARTICULATES-- Should Nonpoint Sources Be Controlled?	(9 Issues)
8	MONITORING-- Is It Effective?	
9	SITING OF NEW ENERGY FACILITIES-- Is EPA's Offset Policy Reasonable?	
10	WATER QUALITY GOALS-- Are They Reasonable?	
11	REQUIRED TREATMENT LEVELS-- Are They Cost-Effective or Beneficial?	Water
12	MUNICIPAL CONSTRUCTION GRANT PROGRAM-- Is It Being Effectively Managed?	Quality
13	AREAWIDE PLANNING-- What Role Now?	(4 Issues)
14	POLLUTION CREATED BY POLLUTION CONTROL	Multimedia
15	FEASIBILITY OF USING COST/BENEFIT ANALYSIS	General
16	ALTERNATIVE STRATEGIES FOR CONTROLLING POLLUTION	General

II. AIR POLLUTION ISSUES

There has been serious concern about air pollution in U.S. cities since the end of World War II, when some States began controlling air pollution. The Congress followed with legislation providing a framework for a concerted, comprehensive cleanup of the Nation's air. The Clean Air Act of 1967 and its 1970 and 1977 amendments were the most important of these Federal laws.

The 1970 amendments provided for developing and enforcing two kinds of ambient air quality standards--"primary" standards to protect health and "secondary" standards to protect welfare, including property and esthetics. The 1970 amendment was to achieve primary standards nationwide between 1975 and 1977.

The amendments also set forth a two-part strategy for attaining this goal: first, EPA was to establish air quality standards for major pollutant classes. EPA issued these standards in November 1971 that covered particulates, sulfur oxides, hydrocarbons, carbon monoxide, oxides of nitrogen, and photochemical oxidants.

Next, the States were to develop implementation plans that indicated how they intended to achieve the standards. Typically, each implementation plan is a compilation of State air pollution statutes, regulations, and pollution control strategies that includes emission limitations, land use controls, and transportation controls. EPA is required to either approve the State implementation plans (thus making them part of Federal law) or amend them in conformance with its criteria for attaining ambient air standards.

The 1970 amendments were intended to minimize pollutant emissions from new sources. EPA established emission standards for major new stationary sources (such as powerplants, factories, and refineries) and for new mobile sources (such as automobiles and trucks that had not yet been produced). The amendments also required a 90-percent reduction in major pollutants from automobiles within 5 years.

The Clean Air Act was amended on August 7, 1977; this was when we had completed our fieldwork and were drafting our report. We, therefore, analyzed the effects the amendments had on our conclusions and recommendations and made modifications, where appropriate. The 1977 amendments addressed many of the issues we examined and, in some cases, resolved them.

The amendments, among other things, e ended the timetables for achieving air quality and automc le emission standards, required refinement of ambient air quality standards, required EPA to establish a national air quality monitoring system, and required a study of the effects of particulates on health and whether control technology is available.

Issue #1: GOALS AND TIMETABLES--Should They Be Changed?

Background:	Issues:
The Clean Air Act is to protect public health and welfare from the effects of air pollution. This goal was to be achieved by mid-1975. This timetable was not met, and the Clean Air Act Amendments of 1977 extended the timetable to December 31, 1982. In case of severe pollution problems, States may be granted extensions to December 31, 1987. No firm date has been set to protect the public's welfare.	—Are the goals achievable? —Are the timetables reasonable?

GOALS AND TIMETABLES (Continued)

Our view:	Congressional and EPA action:
The goal to protect human health and welfare is laudable, but the current air quality standards probably will not be achieved in all regions of the country by 1982 or 1987, as required by the 1977 amendments. This being the case, EPA should have the flexibility to establish interim achievable standards and extended timetables for those regions where it is clear that the mandated goals and timetables cannot be achieved. This will assure continued progress in reducing air pollution levels and will encourage States to prepare realistic control strategies with firm compliance dates. Otherwise, States will prepare or EPA will dictate control strategies that cannot be achieved in reasonable periods of time in certain regions of the country (such as the Los Angeles area).	**Congressional** The 1977 amendments extended the timetable to achieve primary ambient air quality standards to December 31, 1982, with extensions to December 1987 for severe pollution problems. However, even the 1987 deadline may not be achievable in some regions of the country. Therefore, the Congress should require EPA to periodically report on States achieving mandated air quality standards and, if warranted, propose alternatives such as waivers, interim standards, and extended timetables. **EPA comments** EPA said that the Congress would not be receptive to further consideration of goals and timetables. We agree that goals and timetables were deliberated on by the Congress when considering the 1977 amendments to the Clean Air Act. We are proposing that, in future deliberations, the Congress consider giving EPA greater flexibility to avoid the adoption of unrealistic or unreasonable control strategies to assure continued progress. Reference: Main Report, pages 6 to 10.

Issue #2: AMBIENT AIR QUALITY STANDARDS--Do They Need Refinement?

Background:

The Clean Air Act Amendments of 1970 required EPA to promulgate both primary and secondary ambient air quality standards. States are required to achieve these standards by requiring polluters to reduce emissions from stationary sources and by reducing pollutants from automobiles by restricting their use. Automobile manufacturers must also reduce mobile source emissions by meeting congressionally mandated standards.

In 1971, EPA promulgated standards for six pollutants—sulfur oxides, total suspended particulates, carbon monoxide, photochemical oxidants, hydrocarbons, and nitrogen oxides.

Issues:

—Was the health effects research sufficient as a basis for developing ambient air quality standards?

—If not, is there a need for additional research to modify the standards?

AMBIENT AIR QUALITY STANDARDS (Continued)

Our view:	Congressional and EPA action:
EPA should as soon as possible perform the necessary health effects research to determine at what levels ambient air quality standards should be set. There is much uncertainty as to whether the EPA standards are correct. This uncertainty exists because EPA has not adequately expanded the information base through research to either adequately support and/or modify national ambient air quality standards. As a result, the standards have not been reviewed and updated by EPA.	**Congressional** The 1977 amendments require EPA to not later than December 31, 1980, and at 5-year intervals thereafter, make a thorough review of the criteria and standards and make revisions where appropriate. EPA is also directed to appoint an independent scientific review group to assist in the review. **Administrator, EPA** To proceed with the review of criteria and standards in a logical and timely manner, we recommend that the Administrator, EPA, determine the funding and staffing needed to expand the information base to determine whether the standards should be revised and to provide this information to the Congress in its budget requests. **EPA comments** EPA commented that through zero base budgeting our recommendation would be implemented. Reference: Main Report, pages 10 to 17.

Issue #3: STATE IMPLEMENTATION PLANS--Are They An Effective Implementing Mechanism?

Background:

To implement the Clean Air Act, EPA and the States formed a partnership to control air pollution. Under this arrangement, EPA set national ambient air quality standards and divided the country into 247 air quality control regions. Each State prepared and submitted to EPA for approval a State implementation plan.

These plans showed in detail how the air quality standards would be attained and maintained in each air quality control region within each State, subject to a 3-year deadline (after approval) for primary standards and as soon as practicable thereafter for secondary standards. Generally, States had to have their plans approved in mid-1972 and had until mid-1975 to meet the primary standards. The Clean Air Act Amendments of 1977 extended the timetable until 1982, with extensions in certain cases until 1987.

Issue:

--Are State implementation plans the right mechanism to effectively implement air pollution control programs within the framework of national policy?

STATE IMPLEMENTATION PLANS (Continued)

Our view:

The basic concept of State implementation plans is good--individual States are implementing air pollution control programs within the framework of national policy to control pollution based upon State or local conditions. States have not been able to develop implementation plans to achieve ambient air quality standards within the timeframe established by the Clean Air Act Amendments of 1970. A major reason for this was the EPA inability to recognize nonattainment of the standards within the mandated timeframes.

We also noted the following problems:

EPA had not delegated enough authority to States and had not been overinvolved in the daily operations of State air pollution control agencies.

Individual States were unable to develop strategies to control pollution caused by sources outside their boundaries but were held accountable for achieving ambient air quality standards. The States therefore had been unable to adopt plans to achieve the standards.

Air quality control regions were too broad and, in some cases, did not relate to State implementation plans. Therefore, they were ignored by some States but EPA still used them for reporting and classification.

Congressional and EPA action:

Congressional

The 1977 amendments state as an objective a greater role and greater assistance for State and local governments in the administration of the Clean Air Act. It also authorizes the Governors (subject to EPA approval) to revise the boundaries of control regions to improve air quality maintenance.

Administrator, EPA

In addition to congressional action taken, we recommend that the Administrator, EPA:

--Develop an interstate strategy to control transportable air pollutants and present the strategy to the Congress for approval and implementation authority.

EPA comments

EPA said our recommendation was commendable, but fails to note the complexity of the transportable pollutant problem and that the development of interstate pollution control strategies should await the results of long-term research programs.

We agree that the problem is complex; however, the transportation of air pollutants has been well documented, and EPA should start to develop interstate pollution control strategies now.

Reference: Main Report, pages 17 to 25.

Issue #4: AUTOMOBILE EMISSION REQUIREMENTS--Should They Be Revised?

Background:	Issue:
Motor vehicles are responsible for virtually all emissions of carbon monoxide in all areas of the Nation. They also account for variable proportions of hydrocarbons (27 to 87 percent) and nitrogen oxides (25 to 65 percent), the precursor of oxidants. Although the strategy for motor vehicle emissions controls is to place the burden for control on the manufacturer, vehicle owners are expected to maintain the control devices for the life of the vehicle. Timetables for compliance have been postponed several times, the most recent through the Clean Air Act Amendments of 1977.	--Technological problems in developing pollution control systems and uncertainty as to the effect of automobile emissions on air quality are the primary issues.

AUTOMOBILE EMISSION REQUIREMENTS (Continued)

Our view:	Congressional and EPA action:
There have been improvements in urban air quality as a result of the automobile emission controls instituted to date. However, there have been technological problems in developing automobile emission control systems to meet mandated standards. Most importantly, the relationship between achieving the final emission standards and the resulting air quality is largely unknown. Further, the performance of automobile emission systems is questionable and highly dependent on continuous engine maintenance by the vehicle owner. (See Issue 5.)	**Congressional** The 1977 amendments: —Extend the 1977 standard for 2 to 3 years. —Change the final standard for nitrogen oxides. —Require final standard achievement in 3 to 4 years. —Allow waivers in certain circumstances. **Administrator, EPA** We recommend that the Administrator, EPA: —Press for timely completion of existing research, and perform additional research if necessary before the next deadline, to more adequately define the relationship between automobile emissions and air quality. —Propose, if warranted, revised automobile emission standards to the Congress. **EPA comments** EPA stated that it has underway about $5 million of research on automobile emissions and that additional research may not be necessary. We agree that there may not be a need for new research, but there is a need to complete current research before the next automobile emission deadline to guide development of new policies and standards. Reference: Main Report, pages 25 to 30.

Issue #5: TRANSPORTATION CONTROL PLANS--Are They Feasible or Beneficial?

Background:

Transportation control plans are required where EPA determines that direct controls over stationary and mobile sources will not be adequate to achieve and maintain national standards. These plans are primarily directed at reducing automobile emissions by reducing vehicle miles traveled through such strategies as improved traffic flow, parking bans, mass transit improvements, and carpooling. However, many other measures became part of these plans: inspection and maintenance programs, gasoline limitations (rationing), retrofit programs, vapor loss controls at gasoline service stations, petroleum storage and transfer facilities, and dry cleaners.[1]

[1]The 1977 Clean Air Act Amendments allow for suspension of gasoline limitations (rationing) and retrofit programs.

Issues:

—Are transportation plans feasible?

—Are the plans too costly?

—Do the plans significantly improve air quality?

TRANSPORTATION CONTROL PLANS (Continued)

Our view:

Air quality improvements from implementation of transportation plans are largely unknown; none have been implemented in their entirety. Most inspection maintenance programs are not working because of (1) a lack of enforcement, (2) imited geographic coverage, or (3) a refusal to implement such a program.

The rationale for requiring transportation controls must be based on an objective procedure that accurately predicts what improvement in air quality can be expected from imposing the controls. This includes predicting the effect of transportable pollutants on air quality. Modes to do this have been under development for many years and must be completed and used to develop rational transportation controls.

While inspection and maintenance programs may reduce the levels of carbon monoxide in urban areas, there is no way to quantify the effect they will have on photochemical oxidants because automobile pollutants are easily transported. To be effective, regional inspection and maintenance programs cutting across political boundaries are needed.

Congressional and EPA action:

Congressional

The 1977 amendments:

—Direct EPA to publish guidelines on transportation controls, including an assessment of their worth.

—Suspend, until January 1, 1979, retrofits on noncommercial vehicles, gas rationing, and the reduction of onstreet parking space.

—Require implementation of certain aspects of transportation control plans after 1982 to meet the 1987 compliance date.

—Require automobile manufacturers to develop new propulsion systems and emission control technology, which could include maintenance-free or tamper-proof emission control systems.

Administrator, EPA

We recommend that the Administrator, EPA:

—Encourage the development of transportation controls, including inspection and maintenance programs, which take a regional (including multi-State) rather than city approach.

—Enforce regional inspection and maintenance programs.

—Press for timely completion of existing research and conduct new research, if necessary, to quantify the relationship between transportation controls and ambient air quality.

EPA comments

EPA had no comments on our recommendations.

Reference: Main Report, pages 30 to 37.

Issue #6: SULFUR DIOXIDE--Should It Be Continuously Controlled?

Background:

Sulfur dioxide, a byproduct of combustion of oil and coal containing sulfur, is emitted primarily by electric powerplants, steel plants, and smelting plants (copper smelters). Other emitters include sulfuric acid plants, sulfur recovery plants, sulfite pulp mills, and metal processing industries.

Strategies used by States to control sulfur dioxide include:

- Restricting the use of fuels with high sulfur contents.
- Requiring fuel-burning plants to remove sulfur from stack gas.
- Prohibiting the burning of high sulfur content fuel during periods when air quality conditions may become bad (supplementary controls).

In all but a few regions of the country, sulfur dioxide levels are well below the ambient air quality standards. One would assume then that there are no conflicts over controlling sulfur dioxide.

EPA policy, however, requires constant emission controls to reduce nationwide the total amount of sulfur dioxide being emitted. EPA contends that the long-term health effects of sulfur dioxide are not known and that every effort should be made to reduce emissions.

Issues:

- Should pollution control be just good enough so that ambient air quality standards are not violated? Or, should pollution control be as stringent as possible even when ambient standards are met by less rigorous and less costly controls?
- Under what circumstances should the continuous control of sulfur dioxide be required?

Our view:

Supplemental control systems should be allowed, provided that adequate air quality monitoring networks and emission control systems are used to guard against violation of health-related air quality standards. The benefits of constantly controlling sulfur dioxide are largely unknown and most parts of the country are achieving the national ambient air quality standards. Because the cost—estimated to be in the billions of dollars—of constant emission controls are great and the benefits largely unknown, EPA should not require schedules calling for immediate compliance until it has done the research to determine whether they are necessary.

Much more needs to be learned about the benefits of constantly controlling sulfur dioxide (and indirectly, sulfates) before requiring costly controls on existing sources. The purpose of the Clean Air Act is to achieve and maintain ambient air quality standards. If sulfur dioxide standards can be achieved and maintained by using supplemental controls, then they should be allowed.

Supplemental control systems use the assimilative power of the atmosphere to disperse pollutants to prevent violation of air quality standards. Under these conditions, higher sulfur dioxide emissions could be allowed. EPA stated that an air quality monitoring system would be needed and that existing smelters do not have adequate monitoring feedback controls to prevent violations. We agree that an air quality monitoring network would be required in the vicinity of the source to monitor compliance with the health-related air quality standards and to provide feedback to the control system that varied the emission rates. Such a system would need to include a dispersion model that accepts weather forecasts and real-time monitoring data to predict the allowable emission rates; this provides lead time for the control system. The responsibility for acquiring and maintaining such a system should be the sulfur dioxide source. One copper smelter plant and one large powerplant we visited had such a system.

Congressional and EPA action:

Congressional

The 1977 amendments require imposition of continuous emission controls as final compliance strategies. However, the amendments allow for 10 years enforceable supplemental emission reduction strategies for existing nonferrous smelters, as may be necessary to achieve and maintain air quality standards when the alternative is plant closure.

Administrator, EPA

We recommend that the Administrator EPA, should, as required by the 1977 amendments, complete a review of criteria and standards for sulfur dioxide to determine whether it is necessary, from a long-term health effects viewpoint (including the transports/sulfate problem) to proceed with its policy of requiring the installation of constant emission control technology for sulfur dioxide. Use of supplemental controls should be allowed until the review is completed. This review is required to be completed by December 31, 1980.

EPA comments

EPA says that, under the Clean Air Act, it must require constant emission controls except for nonferrous smelters, and only if the alternative is plant closure and the recommendation has limited applicability. Even though required by the Act, implementation and compliance schedules for installing continuous controls are policy issues under the jurisdiction of EPA. We are suggesting that such equipment be required to be installed no earlier than is required by the Clean Air Act Amendments of 1977. We are recommending a "go slow" approach until it can be confidently said that the required controls are commensurate with the expected benefits. To follow the opposite course could result in needless disbenefits that would be detrimental to the economy.

Other EPA comments and our evaluation are included on pages 42 and 43 of main report.

Issue #7: PARTICULATES--Should Nonpoint Sources Be Controlled?

Background:

Suspended particulates come from two sources: emissions from stationary sources (such as powerplants, steel mills, and municipal incinerators) and nonpoint sources (such as salt spray, road dust, forest fires, and dust-producing activities such as construction, unpaved roads, and farming operations).

With few exceptions, all States have enforceable particulate emission limitations for stationary sources which require either the installation of control devices on stacks or changing the processes. But suspended particulate levels are above mandated standards in most areas of the country. Why? More than half the areas did not achieve the standards because of particulates from nonpoint sources (fugitive dust) which are difficult and costly to control.

Issue:

—Should EPA require States to control nonpoint sources of particulates?

Our view:

Nonpoint sources of particulates are almost impossible to control, and it is not known what the benefits would be even if they were controlled. Also, since the ambient air quality standard does not distinguish between harmful and harmless particulates, some areas of the country are classified as noncompliant because of possible harmless nonpoint sources. Consequently, growth in these areas is subject to the EPA nonattainment offset policy discussed in Issue 9.

Before requiring the control of nonpoint sources of particulates, EPA needs to determine whether it is feasible, necessary, or cost-effective. No one, as far as we know, has estimated the cost of how to effectively control nonpoint sources of particulates. It is therefore questionable whether States will ever be able to fully comply with the existing standard.

Congressional and EPA action:

Congressional

The Clean Air Act Amendments of 1977 require EPA, in cooperation with the National Academy of Sciences, to study (1) the relationship between the size, weight, and chemical composition of suspended particulate matter and the nature and degree of the endangerment to public health or welfare presented by such particulate matter, and (2) the availability of technology for controlling such particulate matter. EPA is required to report to the Congress on the results of its study by March 1979.

Administrator, EPA

We recommend that the Administrator, EPA, should *not*:

- Require States to control particulates from nonpoint sources until it has completed its study required by the 1977 amendments.
- Apply the offset policy in areas where nonattainment is due to nonpoint sources of particulates.

EPA comments

EPA said that because of the potential toxic nature of urban fugitive dust, its policy is to require States to develop control programs for urban fugitive dust (nonpoint sources) to the extent necessary to achieve the national ambient air quality standards.

Reference: Main Report, pages 43 to 47.

Issue #8: MONITORING--Is It Effective?

Background:

Monitoring activities are indispensable to effective regulation and enforcement. Sources must be monitored to verify compliance and the ambient air must be monitored to assess strategy effectiveness and trends. Also, control strategies are based upon monitoring results, which must be accurate to assure an efficient allocation of scarce resources.

Issues:

- Are there enough monitors in the right locations to accurately reflect the air quality situation?
- Are the techniques used scientifically valid and consistent?
- Is there enough good data, gathered over a sufficient period of time, to show whether the pollution control strategies are working or not?

Our view:

In many instances monitoring is too sparse or biased by local conditions to give accurate indications of air quality. Further, some of the monitoring techniques themselves leave much to be desired. Some are being corrected, but others are still highly suspicious. Given these difficulties, trend analyses of pollutants becomes more a guessing game than a reasonable assessment. Even where corrections have taken place, the necessary data base for trends will stretch out for years.

Monitoring techniques must be refined or corrected so that air quality can be accurately measured and improvements ascertained. Until monitoring reaches the state where it is an accurate indicator of air quality, EPA should be exceedingly cautious in applying costly and disruptive controls. Where the severity of the problem or even the existence of a problem is also uncertain the end effect becomes riddled with doubt.

Congressional and EPA action:

Congressional

The Clean Air Act Amendments of 1977 required by August 1978 that the Administrator, EPA, promulgate regulations establishing an air quality monitoring system throughout the United States that:

—Utilizes uniform air quality monitoring criteria and methodology and measures such air quality according to a uniform air quality index.

—Provides for air quality monitoring stations in major urban areas and other appropriate areas throughout the United States to provide monitoring such as will supplement (but not duplicate) air quality monitoring carried out by the States required under any applicable implementation plan.

—Provides for daily analysis and reporting of air quality based upon such uniform air quality index.

—Provides for recordkeeping for such monitoring data and for periodic analysis and reporting to the general public by the Administrator for air quality based upon such data.

Reference: Main Report, pages 47 to 53.

Issue #9: SITING OF NEW ENERGY FACILITIES--Is EPA's Offset Policy Reasonable?

Background:

Many areas of the country have not attained ambient air quality standards. New energy conversion sources of pollution, such as petroleum facilities wishing to locate in these areas, may add to the pollution problem. Within a few years coal and oil shale gasification and liquefaction plants will need to be considered.

EPA, in order to allow flexibility for industrial gorwth, established on December 21, 1976, an offset policy setting forth the conditions under which new or expanded major emitting facilities could be allowed in nonattainment areas while conforming to the requirements of the Clean Air Act.

EPA emission tradeoff policy provides that a new source is permitted to locate in a nonattainment area if the new source:

- Applies the best available control technology.
- Has all of its other facilities in the same air basin in compliance with emission limitations.
- Does not increase pollutant emissions at any location presently exceeding national ambient air quality standards.
- Can decrease total emissions in the area sufficiently below total emissions that existed before the construction request, to represent reasonable progress toward attaining applicable air quality standards.

The Clean Air Act Amendments of 1977 allow waivers to the offset policy if a State can demonstrate that it can reduce total allowable emissions equal to reductions under the offset policy.

Issues:

- Is there an alternative to requiring a private company to pay the cost of controlling pollution of other private companies?
- Should interpollutant offsets be allowed?
- Should exceptions to the nonattainment provisions of the Clean Air Act be allowed in cases where energy petroleum facilities are urgently needed?

SITING OF NEW ENERGY FACILITIES (Continued)

Our view:

The EPA nonattainment offset policy is a good idea but, as a practical matter, it should be revised and exceptions allowed on a case-by-case basis.

A private company should not have to pay the cost of pollution control of other private companies. EPA, States, and local governments should be responsible for taking regulatory actions to control air pollution from any source. Placing the burden on a company to find ways to reduce emissions in a nonattainment area from sources it does not control is poor policy and not conducive to well-planned economic development. EPA and the States should identify potential emissions tradeoffs and use incentives to improve pollution control to make possible the entry of new firms

Also, EPA guidelines do not allow interpollutant tradeoffs, although there appears to be technical justification for certain interpollutional trades.

Siting new petroleum facilities in nonattainment areas may be crucial in helping to solve the national energy crisis and could be part of a national energy program when enacted by the Congress.

Congressional and EPA action:

Congressional

New petroleum facilities are having trouble locating in nonattainment areas because they cannot meet EPA or State offset policies. If such facilities are needed to help solve the national energy crisis and are part of a national energy program, then the Congress may want to amend the Clean Air Act to allow on a case-by-case basis exceptions to the nonattainment provisions, provided the companies use the lowest achievable emissions rate and provided the increase in pollution does not impose on residents health risks significantly above acceptable levels.

The Congress may also want to deliberate the possibility of providing economic incentives to existing firms in nonattainment areas to reduce pollutant levels sufficiently to allow the entry of new firms.

Administrator, EPA

We recommend that the Administrator, EPA

- Clearly place the responsibility on EPA regional offices and the States to identify firms where emissions offsets can be obtained;
- Encourage States to provide economic incentives to industries located in nonattainment areas to reduce air pollution, to reduce total emissions and show a continuous improvement in air quality, and to obtain a waiver under the Clean Air Act; and
- study and, if feasible, develop criteria for interpollution tradeoffs.

EPA comments

EPA said that it cannot require States to find offsets; offsets are an option that States and industry have to permit new sources to operate. This may be true but EPA has the responsibility of establishing overall guidance on how its nonattainment offset policy should be implemented.

EPA said the feasibility of interpollutant tradeoffs must await the completion of air pollution health effect studies.

Reference: Main Report, pages 53 to 59.

III. WATER POLLUTION ISSUES

The national program to prevent, reduce, and eliminate water pollution is carried out under the Federal Water Pollution Control Act Amendments of 1972, which established a national program to combat water pollution. It continued and expanded the water quality standards program initiated in 1965 and extended the national program from interstate waters to all navigable waters in the United States. It created a system of national effluent limitations and performance standards for industries and publicly owned waste treatment plants. Also, a new national system of permits for discharges of pollutants into national waters replaced the 1899 Refuse Act permit program and the discharge of any pollutant without a permit became a violation of Federal law.

To assist publicly owned treatment facilities, the amendments established a grant program which pays 75 percent of the eligible costs for planning, design, and construction.

To promote a coherent, integrated, and comprehensive approach to pollution control and effective use of the construction grant funds, the amendments established an areawide planning process. Finally, recognizing that the 1972 Amendments were a venture into an area of many unknowns, the Congress created the National Commission on Water Quality (NCWQ) to evaluate the long-term implication of the requirements in time to make any necessary midcourse corrections. In March 1976 NCWQ provided its general assessment of the water pollution control program and recommended several specific midcourse corrections.

NCWQ addressed many of the issues we analyzed in this evaluation. In this regard, the Congress amended the Federal Water Pollution Control Act in December 1977 and essentially resolved some of the issues. The water pollution issues we analyzed and our views and recommendations follow.

Issue #10: WATER QUALITY GOALS--Are They Reasonable?

Background:	Issues:
The Federal Water Pollution Control Act Amendments of 1972 established an interim goal to achieve by 1983 fishable/swimmable waterways wherever attainable and a final goal to eliminate the discharge of pollutants into national waterways by 1985. By July 1, 1977, municipalities were to install at least secondary treatment and industries were to install the best practicable treatment.	- Should the 1983 interim goal be applied to all waterways? - Is the 1985 national goal reasonable?

WATER QUALITY GOALS (Continued)

Our view:

The "wherever attainable" provision of the 1983 interim goal should be used to exclude from the goal waterways that are seriously affected by natural conditions, nonpoint sources, or immense control costs.

EPA, therefore, should determine the need, the desirability, and the cost of achieving the 1983 goal for all waterways. This effort should be coordinated with State and local government agencies concerned with the use of national waterways. It may be desirable or more cost-effective to have portions of waterways below the 1983 standards. However, such decisions must be coordinated with State and local governments, as they will be responsible for implementing water quality control programs.

The 1985 goal to eliminate the discharge of pollutants is unrealistic, inefficient, costly, and provides little added benefits in water quality.

Having such an idealistic goal prohibits a cost-benefit approach for evolutionary improvements in water quality, and implies that the Nation should make no use of the capacity of water bodies to assimilate certain amounts of organic pollutants, foregoing the use of an economically valuable natural resource. Furthermore, total elimination of discharge is, in many instances, very likely to increase electrical and other energy requirements, thus wastefully using nonrenewable energy resources and shifting the pollution problem from water to air.

Congressional and EPA action:

Congressional

In future deliberations the Congress should consider doing away with the 1985 goal to eliminate the discharge of pollutants, or modifying it to stress water conservation and re-use of resources.

Administrator, EPA

We recommend that the Administrator, EPA

–determine the need, desirability, and cost of achieving the 1983 fishable/swimmable goal for all waterways and

–based on this determination exclude from the goal waterways seriously affected by natural conditions, nonpoint sources, or immense control costs which provide little or no benefits.

EPA comments

EPA did not agree with our recommendation.

We believe that within the constraints of limited resources, funds should be spent for those projects which give the greatest water quality benefits. Where natural or nonpoint sources determine the quality of water, advanced waste treatment processes to control point sources of discharges generally provide few additional benefits in terms of improved water quality. We are *not* recommending that *all* waterways seriously affected by natural conditions, nonpoint sources, or immense control costs be excluded from the goal—*only* those for which expenditures will provide little or no benefits.

Reference: Main Report, pages 61 to 68.

Issue #11: REQUIRED TREATMENT LEVELS--Are They Cost-Effective or Beneficial?

Background:

In the past, authorities looked to the quality of lakes, rivers, and streams as the basis for abatement and enforcement actions. States analyzed the water, attempted to determine the sources of pollution, and tried to develop a plan to restrict pollution discharges. This method was slow, cumbersome, difficult to enforce and often inequitable between similar industries on different bodies of water.

To remedy these difficulties the Congress, with the Federal Water Pollution Control Act Amendments of 1972, chose uniform national technology-based effluent limitations as the primary tool for cleaning up waterways. Also, the Congress retained the concept of water-quality-based limitations where the technology-based limits would not be adequate.

Issues:

—Are the required treatment levels necessary to achieve water quality objectives?

—Should exceptions and extensions be given to municipal and industrial dischargers?

REQUIRED TREATMENT LEVELS (Continued)

Our view:

Great progress has been made in controlling water pollution. Billions have been spent by the public on treatment plants to achieve secondary treatment and by the private sector to comply with the requirement to install the best practicable control technology treatment works.

The legislative requirements, however, for secondary treatment levels by municipalities is not the most effective method of using limited Federal and local pollution control funds when water quality data are available that convincingly demonstrate the lack of need for higher levels of treatment, especially when more effective alternatives have been identified for funding. Likewise, imposition of inflexible best practicable treatment requirements on industry where conditions do not warrant such imposition is a waste of resources. Waivers from such treatment requirements should be allowed, providing that the discharger could prove to EPA that a waiver should be granted on the basis of water quality data.

Congressional and EPA action:

Congressional

The Congress amended the Federal Water Pollution Control Act on December 27, 1977, which allows:

- Extension of the July 1977 requirement until July 1983 for municipal treatment works where construction cannot be completed or where Federal funds have not been made available.
- Extension of the July 1977 requirement for industrial discharges under certain circumstances.
- Waiver from the secondary treatment requirement for municipal discharges into marine waters if water quality standards can be met and maintained.
- Waiver of best available technology requirements for industrial discharges where it can be shown that the reduction in pollution that can be expected from new equipment does not bear a reasonable relationship to equipment cost.

The amendments, however, do not allow for waivers from secondary treatment requirements for municipalities discharging into fresh waters nor do they allow for waivers from best practicable treatment requirements for industrial dischargers. Such waivers should be allowed on a case-by-case basis to recognize and take advantage of the large assimilative capacity of national waterways. The discharger would have to prove to EPA that a waiver should be granted on the basis of water quality data.

The Congress in future deliberations may want to further amend the Federal Water Pollution Control Act to allow EPA more flexibility on treatment requirements.

EPA comments

EPA disagreed with our congressional proposal, saying that it does not want to revert back to the time when EPA had to prove a discharger was violating water quality standards in order to take enforcement actions. This is not what we are calling for. We are proposing waivers from treatment requirements where the discharger can prove it should be granted; not a reversal to water-quality-based effluent limitations.

Reference: Main Report, pages 68 to 76.

Issue #12: MUNICIPAL CONSTRUCTION GRANT PROGRAM--Is It Being Effectively Managed?

Background:

The Federal Water Pollution Control Act Amendments of 1956 (Public Law 84-660) created the waste treatment construction grant program. The act authorized grants for constructing waste treatment facilities to prevent untreated or inadequately treated sewage or other waste discharges into waterways. The grant recipient--usually a municipality--received Federal assistance of 30 percent of the project costs. Subsequent amendments to the act increased the Federal share of project costs up to a maximum of 55 percent, and the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500) established the Federal share at a flat 75 percent of allowable project costs. Under the 1977 amendments municipalities can receive up to 85 percent for treatment works involving new and innovative technology.

The Congress authorized $44 billion for fiscal years 1973 through 1982 for constructing waste treatment facilities. From fiscal year 1957 to March 31, 1977, Federal funds totaling about $19.9 billion had been obligated under the waste treatment construction grant program.

Issue:

--Has the construction grant program been effectively managed?

MUNICIPAL CONSTRUCTION GRANT PROGRAM (Continued)

Our view:	Congressional and EPA action:
The construction grant program has been unnecessarily slow and cumbersome, replete with financial and administrative control problems. Over the years we have identified many program deficiencies, and EPA has taken action to correct most of them. But if past experience is an indication of future problems, EPA will continue to be plagued with program deficiencies unless it continues to give priority to improving the management of the program. **EPA comments** EPA disagreed with our conclusion that the construction grant program is not effectively managed. EPA agreed, however, that it should give priority attention to improving program management. Reference: Main Report, pages 76 to 80.	None, beyond the recommendations contained in several of our prior reports on the construction grant program.

Issue #13: AREAWIDE PLANNING--What Role Now?

Background:

In drafting the Federal Water Pollution Control Act Amendments of 1972, the Congress expressed the belief that the principal cause of inefficiency and poor performance in the management of waste in metropolitan regions was the incoherent and uncoordinated planning and management that prevails in many areas. Therefore, Section 208 of the Act established a mechanism to provide planning and management throughout each State. All pollution sources within a region were to be considered in the plan; and time frames established required completion of all plans by mid-1976.

Issues:

--Has areawide planning accomplished the intended objectives?

--If not, what should its role be now?

AREAWIDE PLANNING (Continued)

Our view:	Congressional and EPA action:
EPA, States, and 208 local planning agencies have been slow in implementing the areawide planning requirements. Consequently, comprehensive plans will not be completed in many areas until well after 1978. If facility project plans had been completed, areawide planning would contribute little to point source control. The greatest potential effect of areawide planning agencies is that of planning for the control of nonpoint sources of water pollution. Significant unanswered questions require that nationwide research and analysis be done by areawide planning agencies in order to develop effective control strategies that address all pollution sources; only then can cost-effective comprehensive control strategies be developed. Unless this is done a recurrence of the point source areawide planning shortcomings could well occur, wherein deadlines for issuance of permits and obligations of funds supersede and negate comprehensive planning.	**Administrator, EPA** We recommend that the Administrator, EPA, –emphasize the need for areawide planning agencies to obtain the water quality data necessary to plan for the selection and implementation of cost-effective controls of nonpoint sources having the greatest water quality benefits. **EPA comments** EPA had no comment on our recommendation. Reference: Main Report, pages 80 - 84.

IV. MULTIMEDIA AND GENERAL ISSUES

One clearcut observation stemming from this study is that congressional legislation and EPA directives do not adequately consider the interrelationship among air, water, and solid waste pollution control measures. Nor do the laws and directives adequately consider the economic effects that are imposed on industry and consumers and the added requirements for energy and other scarce natural resources.

We are particularly concerned that air and water pollution control legislation, regulations, and enforcement actions--when considered separately--may have important effects on other media areas. A classic example is the potentially large volume of water-polluting sludge that is generated when sulfur scrubbers are required for coal-burning fossil energy steam-electric powerplants, process steam plants, etc. Scrubbers are also presently prone to failure, reduce plant efficiency, and require a sizable investment. Have all the pros and cons of scrubbers been weighed objectively? Have all alternatives been adequately investigated (such as solvent-refined coal or other techniques)? Also, what costs will the Nation pay in the short term for the benefits that might be gained in the long term, if only best practicable sulfur control measures are used for the next few years while alternative methods are being researched?

In general, these questions should be answered as definitively as possible before the Nation embarks on multibillion dollar decisions that have inseparable environmental, energy, and economic consequences that may last over several decades. The three issues contained in this section address the problem of comprehensively considering the environment, economics, and energy.

Issue #14: POLLUTION CREATED BY POLLUTION CONTROL

Background:	Issue:
The strategy to control air and water pollution is to require dischargers to install control equipment to remove pollutants from wastewater effluents and air emissions. The pollutants that are removed have to be disposed of somewhere. Where? They can be disposed only in the air, in water, or on the land.	--Have Federal decisionmakers adequately considered disposing of pollutants captured by pollution control devices?

POLLUTION CREATED BY POLLUTION CONTROL (Continued)

Our view:

The problems surrounding this issue can be attributed primarily to the single-purpose legislation and administration. The situation often arises where compliance with one law or regulation violates another. Unfortunately, environmental protection laws and programs have such single-purpose rigid control requirements that pollution control tradeoffs are not allowed.

The pollution control requirements for industries and municipalities in the Clean Air Act (as amended) and Federal Water Pollution Control Act (as amended) will increase the amounts of waste residue. EPA estimates that the volume of sludge produced by municipalities will double by 1985 from the current estimated level of 100 million wet tons per year.

Traditionally, most municipal sludge has been either incinerated or dumped in the oceans. Current laws, however, either prohibit or severely restrict these modes of disposal; thus land disposal has increased. This has caused problems, especially for large urban areas, because of high costs, unavailability of land, and unknowns concerning its effects on drinking water and food products. Similar situations exist for sulfur sludge resulting from the installation of scrubbers on electric powerplants.

Congressional and EPA action:

Congressional

The Congress should start studying ways to solve the total pollution problem. In future deliberations the Congress ought to consider a multimedia approach to environmental protection by

- —giving EPA the authority to use alternative control strategies that solve the total pollution problem in the most efficient and effective way—not just one part (such as water pollution) and
- —requiring EPA to analyze the environmental effect of pollution control decisions and select the least environmentally damaging alternative.

EPA comments

EPA stated that there are cross-media effects from certain pollution control techniques, and these issues need to be considered by Federal agencies and the Congress. EPA officials also said that EPA is attempting to address multimedia pollution problems under existing legislation, but further effort in this area is required.

Reference: Main Report, pages 85 to 90.

Issue #15: FEASIBILITY OF USING COST/BENEFIT ANALYSIS

Background:

One shortcoming we noted throughout our review was that the primitive state of cost/benefit analysis generally precluded Federal decisionmakers from comparing air and water pollution control costs with benefits. Existing environmental controls were generally established in response to public pressure and concern over the seriousness of the pollution problem. Now, however, there is increasing concern in the private and public sectors about whether the economic and social costs of achieving current environmental protection standards and requirements are worth the degree that the environmental quality is improved.

Cost/benefit analysis is a formal procedure for comparing the costs and benefits of alternative programs and for solving other problems of choice. It has been used by Federal decisionmakers in the area of highway safety to choose alternative solutions.

Issue:

Can cost/benefit analysis be used by Federal decisionmakers to assist them in establishing or revising air and water pollution control goals, policies, standards, and control requirements?

FEASIBILITY OF USING COST/BENEFIT ANALYSIS (Continued)

Our view:	Congressional and EPA action:
The primitive state of cost/benefit analysis in the environmental area has resulted in its limited utility. Research which attempts to advance the state of the art is needed, along with the development and further application of existing technologies. A better relationship between improved environmental quality and reduced physical, biological, and medical damage needs to be developed. Also, these damage functions estimates by themselves can help evaluate pollution control programs, even if the benefit estimates cannot be made in dollars. Finally, the analytical framework of costs and benefits itself can help order existing information and identify areas of uncertainty.	**Administrator, EPA** We recommend that the Administrator, EPA: –Support basic research designed to advance the state of the art of cost/benefit analysis. –Within a reasonable period of time report to the Congress on the feasibility of using cost/benefit analysis to assist Federal decisionmakers in evaluating the need to revise air and water pollution control policies, goals, standards and requirements. **EPA comments** EPA agreed that more research is needed but that it would be a long time before cost/benefit analysis can be used by decisionmakers. Reference: Main Report, pages 91 to 97.

Issue #16: ALTERNATIVE STRATEGIES FOR CONTROLLING POLLUTION

Background:

The Congress adopted regulatory strategies to control air and water pollution. The strategies center on a standard-setting monitoring enforcement regulatory process, coupled with uniform effluent and emission limitation requirements. This process requires complicated interactions between (1) the Congress, which establishes policies, goals objectives, requirements, and the basic structure of the regulatory processes, (2) administrative agencies, which define and implement the regulatory processes, and (3) the courts, which review the administrative implementation of environmental protection laws at the request of opponents and proponents.

Implementing air and water pollution control programs has been beset with many problems. Consequently, the adopted regulatory approach has come under attack from some segments of the private and public sectors.

Issue:

—Are there alternative strategies to control air and water pollution that may be more efficient, cost-effective, and equitable, and that also conserve or minimize additional energy requirements?

ALTERNATIVE STRATEGIES FOR CONTROLLING POLLUTION (Continued)

Our view:	Congressional and EPA action:
Several alternative regulatory strategies have been proposed—primarily by economists. The more prevalent alternative strategy is to use effluent and emission fees or the polluter pays principle. When properly used, effluent and/or emission fees might be able to secure economically efficient pollution cleanup. European countries have endorsed the polluter pays principle, which includes standards and charges. However, few standards have been set and charges to date have not been effective because —they are too low to encourage polluters to take pollution reduction measures, or —their implementation has been delayed until the 1980s, or —there is considerable disagreement on how and in what form the charges should be implemented. The United States has endorsed the polluter pays principle through two international organizations but has yet to establish national policies and programs to develop and implement the principle. It is unlikely in the near term that the Congress will substitute a fee system for the regulatory approach in view of the lack of operational experience with effluent and emission charges. But in the long run a fee system may be, if not the most viable and cost-effective, the most administratively efficient alternative to achieve and maintain the high levels of environmental quality the American people expect. The Congress, in amending the Clean Air Act, directed the Administrator, EPA, to study the feasibility of using emission fees as a means of air pollution control. EPA, under its research and development programs, should experiment with alternative strategies to control pollution in addition to the polluter pays principle.	**Administrator, EPA** Recognizing that the Congress recently directed the Administrator, EPA, to study the feasibility of using emission fees to control air pollution, we recommend that the Administrator, EPA: —Also explore the feasibility of developing alternative regulatory strategies to control other sources of pollution. —Work with foreign countries and international organizations on further developing the polluter pays principle. **EPA comments** EPA agreed with the basic thrust of our view that alternative regulatory strategies should be explored, and has ongoing studies in this area. EPA said that before implementing our second recommendation regarding working with foreign countries and international organizations to promote the polluter pays principle, it appears reasonable to await the results of the ongoing EPA studies. The United States will be in a much stronger position to use moral persuasion if it has a few success stories for examples. Reference: Main Report, pages 98 to 104.

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