United States General Accounting Office

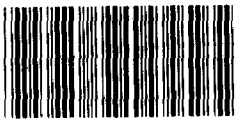
GAO

Report to the Chairman, Subcommittee on Oversight and Investigations, Committee on Energy and Commerce, House of Representatives

November 1988

AIR POLLUTION

EPA's Ozone Policy Is a Positive Step but Needs More Legal Authority



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United States
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-208593

November 23, 1988

The Honorable John D. Dingell
Chairman, Subcommittee on Oversight
and Investigations
Committee on Energy and Commerce
House of Representatives

Dear Mr. Chairman:

At your request we reviewed the Environmental Protection Agency's (EPA) proposed post-1987 ozone policy. This report discusses legal and other problems EPA might encounter in implementing the policy. The report also discusses how the proposed policy addresses problems associated with past ozone programs.

As arranged with your office, unless you publicly release its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. At that time we will send copies of the report to appropriate congressional committees; the Administrator, EPA; and the Director, Office of Management and Budget. We will also make copies available to others upon request.

This work was performed under the general direction of Hugh J. Wessinger, Senior Associate Director. Major contributors are listed in appendix IV.

Sincerely yours,

J. Dexter Peach

J. Dexter Peach
Assistant Comptroller General

Executive Summary

Purpose

Approximately 75 million people live in areas that have not met the national ambient air quality standard for ozone. Ozone, commonly called smog, is linked to reduced lung functions, coughing, chest pain, and a lessened resistance to lung infections.

The 1977 amendments to the Clean Air Act gave states and localities 10 years to meet the national ozone standard, but many areas in the country were unable to meet the final deadline of December 31, 1987. Over the last year the Congress has been considering various legislative proposals to address this situation but had not, as of September 1988, agreed on a solution. In the interim, the Environmental Protection Agency (EPA) proposed a new policy to address ozone and another problem pollutant—carbon monoxide. The Chairman of the Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce, asked GAO to examine the proposed ozone policy focusing on (1) legal authority for the policy, (2) potential problems EPA might encounter in implementing its policy, and(3) whether the proposed policy addresses problems in past ozone programs.

Background

Ozone is not emitted directly into the air but is formed when certain chemicals—primarily hydrocarbons and nitrogen oxides from vehicles and industrial sources—react in the presence of sunlight and heat. EPA's basic strategy for reducing ozone is to control hydrocarbon emissions.

The Clean Air Act Amendments of 1977 required states to identify areas not meeting the ozone standard, and the legislation set December 31, 1987, as the final date to meet the standard. Called nonattainment areas, they consist of cities, counties, and parts of counties. The legislation also required state implementation plans that outlined each area's program for meeting the ozone standard based on an inventory of current and projected hydrocarbon emission sources in the area.

EPA's proposed policy extends the attainment deadlines for meeting the ozone standard, requires areas to submit revised plans, requires a minimum 3-percent annual reduction in hydrocarbon emissions, and outlines economic sanctions to be applied if areas do not develop or implement their plans.

Results in Brief

EPA's proposed policy is a positive step towards addressing the ozone problem; however, in GAO's opinion, EPA does not currently have the proper legal authority to implement it. Putting the policy into effect

without proper legislative authority would make EPA vulnerable to litigation that could frustrate the agency's goal of improving the air quality for millions of Americans. GAO does not believe EPA has authority to extend the attainment deadlines and waive the penalty for not meeting them, withhold highway funds if areas do not submit revised plans, or unilaterally expand the boundaries of nonattainment areas.

Public comments on the proposed policy raised a variety of concerns some of which may affect its implementation. These include (1) costs to state and local governments and (2) the ability of areas to reduce emissions by 3 percent annually.

In GAO's opinion, if the Clean Air Act were amended to provide EPA with sufficient authority, several features of EPA's proposed policy would help to reduce the recurrence of problems identified in an earlier GAO report: it sets specific interim goals and actions if areas do not implement their plans, it requires corrective measures if controls are not working, and it requires greater and more precise data on emission sources.

Principal Findings

Legal Authority

In setting the attainment deadlines, the Congress also provided for a ban on constructing or modifying facilities that would be major sources of pollution in areas that did not fully meet their responsibilities under the 1977 amendments to the Clean Air Act, including the development and implementation of plans that would "provide for attainment . . . not later than December 31, 1987." EPA's proposed policy calls for extending the deadlines 3 to 5 years from EPA's approval of an area's revised plan and waiving the construction ban sanction for those areas who have plans to meet the new timetables. EPA maintains that as long as areas made a persuasive demonstration of their ability to meet the previous deadlines, the ban does not have to be imposed. However, GAO believes that the deadlines were dates for meeting the standard and that the Clean Air Act affords EPA no alternative but to apply the construction ban in those areas that did not meet the deadline.

The 1977 Clean Air Act amendments directed the Secretary of Transportation to withhold federal highway funds to states if EPA found that

states did not submit or make reasonable efforts to submit implementation plans adequate to demonstrate attainment of the ozone standard by the end of 1987. Under the new policy EPA proposes to again impose this sanction against states that do not submit or make reasonable efforts to submit revised plans. However, GAO believes that the Clean Air Act limits the use of the highway funds sanction to those plans that were mentioned in the law itself (those due in 1979 or 1982), and therefore that the sanction does not apply to plans submitted now.

The 1977 amendments also directed states to identify nonattainment areas. EPA is now proposing to enlarge the boundaries of many of these nonattainment areas to include adjacent localities that may contribute to ozone levels in the original nonattainment areas even though the adjacent localities may not exceed the ozone standard. While this proposal has merit, in GAO's opinion, the Clean Air Act does not permit EPA to enlarge the boundaries unless it can show that the added areas actually exceed the ozone standard.

Potential Implementation Problems

Issues, raised in public comments on the proposed policy, may also affect implementation of the policy. Because the proposed policy adds or expands planning and evaluation requirements, many state and local government officials are concerned about the costs of implementation and the financial burden to states and localities. Some said the policy could be implemented only by cutting back on other environmental efforts.

After issuing the proposed policy, EPA developed cost estimates on its implementation. According to these estimates, costs to federal, state, and local governments would increase substantially. Therefore, the question becomes how that burden should be shared; an issue, once the policy is finalized, that EPA and the Congress would have to address during the appropriations process.

Several commenters also expressed concern about the feasibility of meeting the 3-percent annual emissions reduction requirement. They claimed that the rate either could not be met or that it was unfair to areas that have already implemented strict controls. EPA officials believe the 3-percent requirement is feasible, but areas will have to adopt control measures that have been unpopular in the past. Also, EPA has hired a contractor to analyze how three areas could meet the requirement.

Proposed Policy to Address Problems With Past Ozone Plans

In January 1988, GAO reported that three urban areas it studied had not reached planned ozone reductions because, in some cases, planned control measures were not implemented, or those that were implemented were not as effective as anticipated. Also, plans understated the amount of emissions, and areas consequently did not identify enough controls. In addition, GAO concluded that EPA did not fully carry out its oversight responsibilities because it took no action or took action that did not correct the deficiencies it identified in the three areas' ozone programs.

GAO believes that several features of the proposed policy would help to address these problems. The policy would establish timetables for areas to identify and implement substitute measures if they do not implement planned measures, require states and EPA regional offices to evaluate selected control measures to determine if the measures are as effective as anticipated in reducing emissions, and require areas to improve emissions data and to include a greater range of sources. EPA's proposed policy would also require periodic evaluations of an area's progress to help ensure that corrective actions are taken when programs do not achieve planned reductions. In addition, to ensure that the policy is implemented properly once it is finalized, EPA plans to issue guidance on such things as preparing state implementation plans, developing regulations, and preparing and reviewing annual progress reports.

Recommendations

GAO believes that EPA and the Congress need to work together to establish an adequate legislative framework for a policy to address the ozone problem. In its January 1988 report GAO recommended that the legislation should recognize the diverse problems that areas face in reducing ozone and allow flexibility in deadlines for achieving a safe ozone level. GAO also recommended that the legislation clarify the use of economic sanctions used to encourage states and areas to adopt and implement programs to meet the established ozone level. Because the Congress is considering legislation that would amend the Clean Air Act and provide EPA additional authority to implement a post-1987 ozone program, GAO makes no further recommendations.

Agency Comments

GAO discussed the factual material in this report with EPA officials and incorporated their comments where appropriate. However, as requested, GAO did not obtain official agency comments on a draft of this report.

Contents

Abbreviations

CAA	Clean Air Act
CO	carbon monoxide
CTG	control technique guidelines
EKMA	Empirical Kinetic Modeling Approach
EPA	Environmental Protection Agency
GAO	General Accounting Office
MSA/CMSA	Metropolitan Statistical Area/Consolidated Metropolitan Statistical Area
OAQPS	Office of Air Quality Planning and Standards
RACT	reasonably available control technology
SIP	state implementation plan

Introduction

Despite repeated statutory deadlines, many areas in the United States continue to have levels of ozone, a harmful air pollutant commonly called smog, that exceed the national standard. The Environmental Protection Agency's (EPA) latest air quality report shows that approximately 75 million people live in these areas. In January 1988, we reported on several problems that contributed to this condition and recommended that the Congress amend the Clean Air Act (CAA) to better deal with the ozone problem.[1] Shortly before we issued our report, the EPA proposed a policy to address the widespread nonattainment of the ozone standard.[2] The Chairman of the Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce, asked us to evaluate whether the proposed ozone policy addressed the problems identified in our earlier report, and whether it posed any legal or other implementation problems.

Air Quality Regulation

To protect and, in many instances, restore the quality of the air, the Clean Air Amendments of 1970 created a framework under which federal and state governments would control emissions of air pollutants considered harmful to human health and the environment. EPA was to set primary health based national ambient air quality standards for each pollutant, and the states were to prepare state implementation plans (SIPs) showing how each of the standards would be met and maintained. The law made EPA responsible for setting emission standards for new motor vehicles and for issuing information on pollution control techniques for stationary sources. The states were to develop regulations and enforce control measures on stationary sources. Nationwide attainment of the standards was required by mid-1975 with a limited extension possible to mid-1977.

By the time the 1977 deadline arrived, however, many areas in the country had not attained one or more of the six primary national ambient air quality standards, including ozone.[3] Ozone is not emitted directly into the air but is formed when hydrocarbon emissions react with nitrogen oxides in the presence of heat and sunlight. Ozone causes reduced lung

[1] Air Pollution: Ozone Attainment Requires Long-term Solutions to Solve Complex Problems (GAO/RCED-88-40, Jan. 26, 1988).

[2] The proposed policy also covers carbon monoxide (CO); however, our review was primarily directed at those aspects applicable to ozone.

[3] Also called criteria pollutants, primary national ambient air quality standards have been set for six pollutants that endanger human health. They include CO, lead, nitrogen dioxide, particulates, sulfur dioxide and ozone (previously photo chemical oxidants).

functions which can impair breathing and cause coughing and chest pain. Studies using animals have linked ozone to reducing the lung's ability to resist infection.

In the Clean Air Act Amendments of 1977, the Congress recognized the states' difficulties in meeting the primary national ambient air quality standards including the ozone standard and extended the attainment deadline to December 31, 1982, with a possible extension to December 31, 1987, for areas where ozone and CO problems proved particularly intractable. These amendments also required each state to submit a list to EPA of all areas that did not meet the ozone and other standards. When the list was promulgated by EPA, these areas were designated as nonattainment areas. Nonattainment areas had to submit additional SIP revisions and implement stricter control measures in order to qualify for the extensions to 1982 and 1987. As originally promulgated, the list of nonattainment areas included major metropolitan areas, cities, counties, and parts of counties. EPA now believes larger geographical areas made up of several counties/cities is the most effective scale for air quality planning purposes.

GAO Report on Attainment Progress

As the 1987 deadline drew near, the Chairmen of the Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce, and the Senate Committee on Environment and Public Works asked us to examine how the nation was progressing toward meeting the ozone standard, looking particularly at three urban areas that had not attained the standard earlier. We found that most ozone areas that were listed as nonattainment under the Clean Air Act Amendments of 1977 had still not attained the ozone standard by the beginning of 1987. In the Los Angeles, California, area, we found that some control measures the area expected to use, turned out to be too expensive or the technology was not sufficiently developed. In the Charlotte, North Carolina, area, some measures were not enforced, and in both Charlotte and Houston, Texas, the implementation plans did not provide for sufficient controls because of problems with the modeling used to project needed emissions reductions. Finally, we found that EPA did not always use the tools available under the CAA such as economic sanctions to get areas to correct deficiencies in their ozone programs. For example, EPA can apply economic sanctions such as suspending clean air or sewage treatment grants to encourage states and areas to adopt and implement programs to meet the established primary national ambient air quality standards.

To deal with the difficulties EPA and states were experiencing in trying to reduce ozone levels, we recommended that the Congress amend the CAA and (1) set new and different deadlines for areas based on the severity of their ozone problem and (2) specify the conditions under which sanctions should apply. The Congress has been considering three legislative proposals that would address these issues but had not, as of September 1988, passed any final legislation. These proposals are discussed in appendix I.

EPA's Proposed Ozone Policy

Despite the impending deadline, the Congress was not able to agree on amendments to the CAA to address continuing nonattainment after December 31, 1987. Consequently, in November 1987, EPA proposed a policy for a new round of planning to bring those areas into attainment with both the ozone and CO standards. Recognizing that the existing CAA does not contain a post-1987 program for areas that did not meet the standards, EPA nevertheless believed that it had sufficient authority under the current statute to set new attainment dates, utilize sanctions, and set measures of interim progress toward attainment.

Under the proposed policy:

- The areas are to develop and submit new SIPs within 2 years to produce attainment of the ozone standard within 3 years after EPA approves the plan and, for some areas, within 5 years of EPA's approval. EPA expects to approve the SIPs within 1 year of submission.
- EPA will impose a ban on construction or modification of facilities that would be major sources of pollution in those areas that cannot demonstrate attainment within at least 5 years of EPA's approval of the SIP.
- EPA will prescribe some minimum pollution controls to be included in the SIPs.
- EPA will require that areas reduce hydrocarbon emissions by 3 percent a year, in addition to federal control measures and measures already implemented.

To determine whether an area has attained the ozone standard, EPA relies on air quality monitoring data. Under the proposed policy, areas seeking attainment designation would have to provide EPA with 3 years of data showing no more than three exceedances of the ozone standard. EPA also proposed that before being designated as in attainment, areas be required to demonstrate in their SIPs that the standard will be maintained for at least 10 years. As of September 1988 EPA was assessing the

public comments on its proposed policy and expects to publish the final policy in late 1988 or early 1989.

Objectives, Scope, and Methodology

Because EPA issued its proposed policy after we had concluded our earlier audit work, we were not able to include an analysis of the policy in our January 1988 report. Subsequently, the Chairman of the Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce, asked us to examine the proposed ozone policy focusing on

- legal authority for the policy,
- problems EPA might encounter in implementing the policy, and
- whether the proposed policy would correct the problems identified in our earlier report.

The Chairman also asked us to comment on the effect that the House bill (H.R. 3054, 100th Cong. 2nd Sess.) would have on the use of modeling in air quality planning. Our response is included in appendix II.

To determine how the proposed policy addresses past problems in attaining the ozone standard, we discussed the policy with EPA officials at headquarters in Washington, D.C.; the Office of Air Quality Planning and Standards (OAQPS) in Durham, North Carolina; and the Motor Vehicle Emissions Laboratory in Ann Arbor, Michigan. We also examined EPA's comments on how its proposed policy would address the problems identified in our January 1988 report, furnished to the Subcommittee Chairman at his request.

Our legal analysis of EPA's proposed policy was based on a review of the CAA, its legislative history and judicial interpretations, as well as a review of EPA policy statements, and our own prior legal opinions.

To identify other potential problems with implementing the proposed policy, we relied on public comments submitted to EPA by state and local governments, environmental groups, companies and industry associations, and other interest groups. After analyzing the comments for major areas of concern, we discussed the issues raised with OAQPS officials, who in some cases furnished us with additional information. In addition to the implementation issues discussed in chapter 4, a summary of public comments on other issues is provided in appendix III.

We conducted our audit work between February and May 1988 following generally accepted government auditing standards. We discussed

with EPA officials various aspects of the proposed policy addressed in this report and have included their comments where appropriate. However, as requested, we did not obtain official agency comments on this report.

Elements of Proposed Policy Exceed EPA's Authority

Although the final deadline for attainment of the ozone and CO standards has passed, EPA can still call for additional revisions to the existing nonattainment area SIPs and require that these new SIP revisions meet the same specifications as earlier SIPs. EPA should not try to use the highway funds sanction to promote submission of these additional SIP revisions, however, because that sanction is no longer available. Meanwhile, during the SIP revision process, EPA cannot legally waive the CAA's mandatory sanctions for nonattainment and nonimplementation. EPA can designate some new areas as nonattainment, thereby subjecting them to more stringent requirements than they would otherwise have to meet. However, there is no authority to expand the boundaries of existing nonattainment areas to include nearby localities, if those localities are not experiencing violations of the standards.

These findings mean that before the proposed post-1987 ozone policy could be put into effect, the CAA would have to be amended to permit those actions that are currently unauthorized. Failure to secure proper legal authority before implementing the policy would invite litigation, with the consequence of delay and possible frustration of EPA's commendable goal of expediting progress toward attainment of the ozone standard.

Congress Structured the Clean Air Act to Produce Attainment by December 31, 1987

The original CAA's final deadline for attaining the primary national ambient air quality standards, which include the standards for ozone and CO was mid-1977. In preparing for that deadline, states were divided into air quality control regions and required, under section 110 of the act, to submit SIPs that would identify and implement the control measures necessary to produce attainment by the deadlines. Many areas of the country failed to meet the original deadline and, as a result, were placed under construction restrictions that severely hurt the economy.

To remedy that situation and to restructure the law so that massive nonattainment would not occur again, the Congress enacted the CAA Amendments of 1977. The amendments required state governors to identify the nonattainment areas in their states and created new requirements for SIPs in the nonattainment areas under Part D of the CAA. Part D was added to and entwined with the SIP requirements that already existed in section 110.

Part D generally extended the attainment deadlines for all the primary national ambient air quality standards to December 31, 1982, with a second extension allowed for ozone and CO to December 31, 1987. To obtain

the extensions, states had to file revisions to their SIPs and implement specific control measures listed in the statute. Among other items these mandatory control measures included were (1) producing a steady volume of emissions reductions, calculated to attain the standard by the applicable deadline (Reasonable Further Progress); (2) adopting all EPA-identified Reasonably Available Control Technology (RACT); and (3) setting an enforceable schedule for implementing a vehicle inspection and maintenance program to obtain the final extension. The main difference between Part D and section 110 is that, under Part D, the specific control measures listed in the law were absolutely required, whereas under section 110, EPA could not require a state to implement any particular control measure such as vehicle inspection and maintenance, unless the state agreed that it was necessary.

To complement the new requirements in Part D, the Congress also enacted two relevant changes in section 110. In section 110(a)(2)(I), the Congress temporarily suspended the existing construction ban on the condition that the nonattainment areas would comply fully with all of their responsibilities under Part D. Also, the Congress added language to section 110(a)(2)(H) of the act which would allow the Administrator to call for unscheduled SIP revisions to comply with the requirements of Part D in addition to calling for revisions any time an existing SIP was found to be "substantially inadequate" to produce attainment.

At the time the 1977 amendments were enacted, it was thought that adherence to Part D would produce attainment by the final 1987 deadline. When attainment was reached, Part D could be disengaged, and the permanent authority in section 110 for maintaining the standards through continued SIP implementation, enforcement, and (when needed) revisions would reengage. Part D and the 1977 amendments were designed to produce attainment, and not to respond to the recurrent situation of massive nonattainment which exists today.

EPA Does Not Have Authority to Waive Sanction and Extend Attainment Deadlines

With the December 1987 deadline fast approaching, EPA found that many areas still exceeded the ozone and CO standards. Since the CAA does not address the problem of continued nonattainment, and the Congress had not completed work on revised clean air legislation, EPA proposed its own comprehensive policy in November 1987 for responding to post deadline ozone nonattainment. The proposed policy does not contemplate reimposing the construction ban that had been temporarily suspended by section 110 (a)(2)(I) but calls for another round of planning

to attain the standard around 1994 or 1996 instead. In our view, the construction ban must be reimposed.

EPA's post-1987 policy proposal would administratively extend the deadline in lieu of imposing the statutorily-required construction ban. We infer from this proposal that EPA does not view the statutory requirement to "provide for attainment as expeditiously as practicable, but not later than December 31, 1987" as creating a true deadline for attainment of the standard. In fact, EPA says in the proposal that historically it has interpreted the CAA to set requirements for states to produce plans that persuasively demonstrate attainment of the standards by the statutory dates—not a requirement that areas actually attain the standards by those dates. Using this interpretation EPA states that it would not impose the construction ban on areas that failed to meet the standard as long as they had approved Part D SIPs. Consistent with this interpretation, EPA's policy proposes imposing construction bans now on those areas that did not have approved Part D SIPs.[1]

For those areas that did have SIPs approved under Part D, but did not meet the standard by the deadline, EPA proposes waiving the construction ban, extending the deadline, and allowing another 2 years to submit additional SIP revisions that demonstrate attainment within 3 to 5 years after EPA approves the new SIP revision. In a related action, EPA also proposed to impose the construction ban now on areas that, because of the severity of their ozone/CO pollution problems, cannot submit a SIP revision under the policy that make a "persuasive demonstration of attainment" within at least 5 years after EPA's approval. The reason for this is those areas would not be able to produce an approvable SIP.

When the first Part D deadline passed on December 31, 1982, EPA originally announced a hard line policy on the applicability of the construction ban and would have imposed it in every nonattainment area that missed the deadline. In a legal opinion we prepared in April 1983,[2] we agreed and took the position that the statutory date was a deadline for actual attainment, not merely a planning target.

Our reasoning was that when the Congress suspended the construction moratorium in section 110(a)(2)(I) of the act, it was on the condition that an area would comply with Part D, which, in turn, required that the

[1]On August 31, 1988, a construction ban became effective in the Los Angeles, California, area because EPA disapproved the area's Part D SIP.

[2]See our legal opinion B-208593, April 21, 1983.

revised implementation plans "provide for attainment . . . not later than December 31, 1982" (or December 31, 1987, if a second extension were secured). In our view, fulfilling the requirements of Part D meant providing for attainment in the real sense, not projecting attainment on paper. A SIP that did not produce attainment did not sufficiently provide for attainment and therefore would not qualify for continued suspension of the construction ban on the grounds that it fully met the requirements of Part D.

Later in 1983, EPA decided that it would be more productive to work with the states to make improvements in their SIPs rather than to impose the construction ban. As a result, in November 1983 it waived the sanction and called for more planning instead. The post-1987 ozone policy represents a continuation of that same philosophy. We see the practical merits of this approach to the nonattainment problem, but despite the considerable latitude EPA enjoys as the agency charged with administering the CAA, imposing the construction moratorium remains an action that is required by the existing law.

The effect of deferring the nonattainment sanction required by law to be imposed is equivalent to administratively extending the deadline. Because the deadline is statutory, we believe that EPA does not have the authority to extend it beyond the date set by the Congress. As stated in an earlier report,[3] if EPA wishes not to impose construction bans in continued nonattainment areas, it must seek changes to the CAA that would relieve the agency of this responsibility.

EPA No Longer Has Authority to Impose the Highway Funds Sanction

In addition to the construction ban, Part D of the CAA also enumerated other sanctions. One section of Part D directed the Secretary of Transportation to withhold federal highway funds from states if the EPA Administrator found that the state had not timely submitted, or was not at least making reasonable efforts to submit, a Part D SIP revision, containing all the specific control measures (such as RACT and vehicle inspection and maintenance) required by the law. Moreover, the law identifies the specific SIP revisions it applies to by their due dates; July 1, 1979, and July 1, 1982.

EPA proposed in the post-1987 ozone policy to use the highway funds penalty if future SIP revisions are not submitted complete and on time. Thus, under the proposed policy, states that do not submit or do not

[3]EPA's Policy Is Not Consistent With the Clean Air Act (GAO/RCED-85-121, Sept. 30, 1985).

work toward submitting implementation plans that can demonstrate attainment by 1994 or 1996 would face a cutoff of federal highway funds.

We believe the highway funds sanction is no longer available. In a legal opinion we issued in February 1986, we found that this sanction was only available for promoting submission of the SIP revisions mentioned in the law itself, which are the Part D SIP revisions due on July 1, 1979, and July 1, 1982. It follows that any SIP revision called after the expiration of the Part D deadlines is not subject to the highway funds sanction, and EPA cannot preserve the availability of this sanction by deciding that SIP revisions called under the post-1987 policy would be "under Part D."

EPA is also proposing to use the highway funds sanction in areas with extremely severe long-term problems to promote compliance with what the agency considers to be "reasonable efforts attainment dates." These flexible attainment dates are proposed to apply to areas that cannot persuasively demonstrate attainment within 3 to 5 years after a new SIP is approved, and would be calculated by factoring a mandatory percentage of annual emissions reductions and the total reductions needed to produce attainment. We would have serious reservations about this proposed use because in our view, the highway funds sanction was very limited in its application, and, in any event, is no longer available.

EPA Cannot Waive Sanction for Nonimplementation

Under another provision of the CAA, the EPA Administrator cannot make any clean air grants to states that are not implementing all the control measures in an approved SIP. This sanction applies both to Part D SIP revisions and to revisions under section 110. Clean air grants are made for state administration of air quality improvement programs. As we stated in an earlier opinion,[4] the clean air grants sanction is not discretionary but is required whenever the Administrator makes a finding of nonimplementation.

In its post-1987 ozone proposal, however, EPA has stated its intention not to invoke this sanction, arguing that cutting off funds that are intended for implementation would be counterproductive and would create effects probably not intended by the Congress.

[4]B-208593, April 21, 1983.

Instead of using the clean air grants sanction, EPA announced its intention to require nonimplementing areas to reject requests for new construction permits in the area. Mandatory construction permits are a control measure required under Part D, and denying them in nonimplementing areas is indeed a secondary option to penalize nonimplementation, but it has some drawbacks. The principal drawback is that the sanction is only effective where the nonattainment area is not already under a construction ban for some other reason. Moreover, we believe the CAA does not permit the Administrator to waive the air grants sanction where nonimplementation is determined.

Specific Control Measures Can Be Required in New SIP Revisions

EPA should enforce the 1987 deadline and impose the construction moratorium, but that is not all it can do in the post deadline phase of the CAA. There is authority in section 110(a)(2)(H) of the CAA to call for additional unscheduled SIP revisions now. This section permits the Administrator to call for unscheduled SIP revisions whenever he determines that the existing SIP is substantially inadequate to achieve attainment. The fact that an area has not attained the standard after the expiration of the deadlines obviously indicates that such action is appropriate.

Considering that section 110 SIPs do not include the mandatory Part D control measures, the question arises whether the statutory Part D control measures (RACT, reasonable further progress, vehicle inspection and maintenance and the construction permit system) can be required in the unscheduled SIP revisions called under section 110(a)(2)(H).

EPA indicated in the post-1987 policy that many of the SIP revisions called will be under Part D, but others will be under section 110(a)(2)(H).[5] For the SIP revisions EPA considers to be under Part D, it will naturally require the Part D control measures to be continued, but it also indicated that it intends to require the Part D control measures in the unscheduled SIP revisions under section 110(a)(2)(H). EPA cited only presumptive congressional intent as the source of authority to require those control measures in the unscheduled SIP revisions. We agree that the Part D control measures can be required in the next round of SIP revisions under section 110(a)(2)(H), but for somewhat different reasons.

[5]In February 1986, we found that the proper authority to call for any and all SIP revisions after the expiration of the deadlines was section 110(a)(2)(H), not Part D. B-221421, Feb. 28, 1986.

Section 110(a)(2)(H) itself provides the authority to include Part D control measures in the SIP revisions called under its authority. The Administrator is authorized to make unscheduled SIP calls whenever he finds that

"the plan is substantially inadequate to achieve . . . the standard which it implements or to otherwise comply with any additional requirements established under the Clean Air Act Amendments of 1977. . . ." (Emphasis added.)

The 1977 amendments established Part D, which mandated that particular control measures (among them RACT, reasonable further progress, and vehicle inspection and maintenance) be included in all SIP revisions submitted under Part D. The statutory control measures required for Part D SIPs are certainly "requirements established under the Clean Air Act Amendments of 1977," that can be included in a SIP call under section 110(a)(2)(H). The quoted language effectively built the Part D requirements into section 110(a)(2)(H) for all nonattainment areas subject to an unscheduled SIP call because their previous SIPs did not create attainment.

EPA Has Limited Authority to Redesignate Areas as Nonattainment

Our conclusion that EPA has authority to require the Part D control measures to be included in new SIP revisions called under section 110(a)(2)(H) of the CAA has strong implications for areas currently considered attainment that might be designated as nonattainment now or in the future. Through section 110(a)(2)(H) SIP revisions, such areas can be required to comply with the more demanding control measures of Part D. In an August 1988 legal opinion,[6] we agreed that EPA would be permitted to "take appropriate steps" to designate some new areas as nonattainment under authority in the Fiscal Year 1988 Continuing Resolution. This means newly designated nonattainment areas can be compelled to include the Part D control measures in any unscheduled SIP revisions.

Under its ozone policy EPA is also proposing to enlarge the boundaries of some existing nonattainment areas to include nearby localities that may not violate the standards themselves but contribute to pollution in the adjoining nonattainment area by commuter automobile traffic or upwind stationary sources. In the same August 1988 opinion, we found that EPA has no authority to list an area as nonattainment if it in fact meets the standards, regardless of its residents' possible contributions to

[6]B-208593.3, August 2, 1988. The opinion analyzed EPA's designation authority under section 107 of the CAA and under the Mitchell-Conte amendment to the Fiscal Year 1988 Continuing Resolution.

the pollution of another area. While courts have upheld EPA's authority to refuse to upgrade the designation of a nonattainment area in such circumstances, initial designation is a different matter altogether. There is no basis for EPA to modify the current status of an attainment area unless monitoring/modeling or other reliable information shows a violation. EPA's additional authority in the continuing resolution to designate some new areas as nonattainment, only extends to those areas "failing to attain" the standards.

We believe that in principle, enlarging nonattainment areas is a sound method of securing further progress toward attainment (see ch. 3). However, it would take legislative action to redefine the term "nonattainment area" and to change the current designation process in order to expand the boundaries of the existing nonattainment areas to include adjacent jurisdictions where the standards have been met. Since annexed areas cannot be properly redesignated under the act, it follows that the Part D control measures cannot be imposed on those areas through a section 110(a)(2)(H) SIP revision.

Conclusions

On the whole, we are sympathetic to EPA's attempts to improve air quality for the millions of Americans living in areas that still do not meet the ozone standard. And as we discuss in chapter 3, some aspects of the proposal, for which we believe EPA lacks authority under the current CAA, including expanding nonattainment areas, are actions that would address some of the problems identified in past ozone programs.

Desirable or not, however, certain features of the proposed policy are not authorized by the CAA. At the same time, as discussed in appendix I, the Congress is considering proposals that would provide authority for a post-1987 ozone program by setting new attainment dates, clarifying the use of sanctions—actions we recommended in our January 1988 report—and adjusting boundaries of nonattainment areas. For these reasons we believe that EPA and the Congress should work together to establish the legislative framework needed for a new ozone policy.

Proposed Policy Is Designed to Prevent Reoccurrence of Some Past Problems

In our January 1988 report, we found that some areas did not reach planned ozone reductions because (1) they did not implement all the measures in their SIPs, (2) some measures that were implemented were not as effective as anticipated, (3) their inventories and modeling estimates understated the amount of control needed to reduce ozone, and (4) EPA was not taking adequate steps to ensure that areas corrected identified deficiencies.

In addition, we said other factors, such as the scientific uncertainties in ozone formation, weather patterns, inventorying sources, modeling, and determining the amount of control needed, plus the enormity of the problem, all contributed to the deadlines being unachievable. While more effective program implementation and stronger oversight by EPA could have led to correction of some of the problems, larger issues needed to be addressed first. Accordingly, we recommended that the Congress amend the CAA to deal with these difficulties by setting new and different deadlines for areas based on the severity of their ozone problem and specifying the conditions under which sanctions should apply.

Subsequent to our report, the Chairman of the Subcommittee on Oversight and Investigations asked the Administrator of EPA to provide his views on the report, including whether the problems we identified would be any less under EPA's proposed policy. In a May 5, 1988, response, the EPA Administrator said the report was generally factual except for our position on imposing the construction ban sanction[1] and that the reasons for ozone nonattainment were identical to EPA's findings. He outlined steps EPA would be taking under the proposed ozone policy to correct past problems and said our recommendations were compatible with the direction of EPA's proposed policy. The following sections discuss the past problems identified in our report and how the proposed policy is designed to prevent them from recurring.

[1] As discussed in chapter 2, we have continually maintained that the construction ban is the mandatory penalty for nonattainment after the attainment deadline passes. On the other hand, EPA maintains that the Administrator does not have to impose the ban solely because an area failed to meet the standard by the legislative deadline.

Problems With Implementation and Effectiveness of Control Measures

We reported that reductions in ozone levels were not as great as anticipated because some control measures were not implemented and measures implemented were not as effective as anticipated. This applied to measures for reducing emissions from stationary sources as well as mobile sources. Stationary-source control measures had not been implemented because the control technology was not fully developed or the local air quality board considered the measures too costly. In addition, we said areas did not always view implementation of control measures as a high priority if the measures involved changes in lifestyles or industrial or business development.

To ensure that control measures to reduce emissions are implemented as planned, EPA proposes to approve SIPs only where some minimum form of adoption has taken place. This policy is designed especially for those control measures that take a long time to implement and require approval from various governments, such as transportation related measures. The form of adoption must be sufficiently binding on the state to assure that the measure will, in fact, be implemented as scheduled in the plan. In the past, according to agency officials, EPA gave some plans conditional approval without requiring some form of adoption. In addition, the proposed policy calls for a tracking program to ensure that emissions are reduced as planned and that adopted control measures are implemented on schedule. Areas must show progress in reducing emissions each year and, at the same time, report on the implementation status of control measures. If emissions have not been reduced as planned because some measures have not been implemented, additional measures must be submitted within 9 months in a revised SIP, and the reduction must be achieved within 2 years. The policy also calls for EPA to impose sanctions if an area does not make reasonable efforts to bring about the emissions reduction.

In its May 5, 1988, letter to the Chairman, EPA said the net annual 3-percent emissions reduction requirement would help to address the problem of reluctance to implement control measures that affect lifestyles or economic development. To meet this reduction, EPA said that some areas will be forced to choose such measures. Further, EPA said that it is devoting substantial amounts of time and effort to the task of getting information on the proposed policy to state and local officials as well as to the general public.

Previously, areas were allowed to assume that planned control measures were 100-percent effective. EPA found, however, that this was not the

case. To address the problem of overestimating the effectiveness of control measures, EPA is proposing an 80-percent effectiveness rule. Under this approach, areas will not be able to assume that planned controls are more than 80-percent effective in obtaining expected emission reductions. However, if an area can demonstrate that a control measure is more than 80-percent effective, EPA will allow a higher credit for reducing emissions. In addition, the proposed policy would require states and EPA regional offices to annually evaluate selected regulations and programs contained in their SIPs to determine whether they are achieving their intended effect. An area's annual reporting must summarize the results of the evaluations and outline any corrective action that is needed, along with an implementation schedule.

Overall, EPA's approach should help address past problems of unimplemented and ineffective control measures. How effective the changes will be is difficult to predict. As discussed in chapter 4, many parties commenting on the proposed policy question whether the 3-percent annual emissions reduction requirement can be met. Also, as discussed in appendix III, some parties question the appropriateness of the 80-percent rule and the value of effectiveness evaluations.

Problems With Emissions Inventories

EPA's basic strategy for reducing ozone is to control hydrocarbon emissions. As part of the planning process, areas conduct an inventory of the level of hydrocarbons emitted (current and for the period covered by the plan) and their sources. This information is used to determine how many tons of hydrocarbons need to be reduced to reach the ozone standard. If the inventory understates the level of emissions, an area will likely not identify all controls necessary to reduce ozone levels sufficiently.

Techniques for compiling emissions inventories are inexact, ranging from questionnaires to models that project emissions from mobile sources. In the past, EPA required all major sources—plants and facilities emitting 100 tons per year—to be inventoried individually, while emissions from smaller sources could be inventoried individually or collectively as area sources. Information on major sources typically comes from questionnaires, plant visits, and permit data, while small source emissions are determined from individual plant information, local surveys to determine the amount and type of hydrocarbon-emitting products that are sold and used in an area, and per capita estimates using emission factors developed by EPA.

We reported that one of the major reasons for the lack of progress in attaining the ozone standard was an understatement of hydrocarbon emissions. In some cases, emissions were excluded from inventories because their sources were not originally considered significant. Inventories were also low because areas understated vehicle miles traveled and emissions from small sources, and used faulty assumptions in their modeling efforts.

While techniques for gathering emissions data will continue to be inexact, EPA is proposing actions to make emissions inventory data more accurate. They include

- expanding the geographical boundaries of planning areas and including other sources that contribute to ozone formation, such as publicly owned sewage treatment plants and hazardous waste treatment, storage, and disposal facilities;
- requiring detailed process and emissions data on all sources emitting 10 tons or more rather than only for sources emitting 100 tons or more;
- including all major sources 25 miles adjacent to urban planning areas; and
- allowing more time to gather emissions data and more time for EPA to review the data.

EPA is also proposing to refine and standardize emission factors and collection methods for area sources. Further, EPA has updated and developed guidance for regions, states, and local air quality agencies to use in developing and reviewing inventory data, according to OAQPS officials. Finally, as discussed in the following section, EPA has made several changes in the emission factors in its mobile-source emissions model to improve the model's accuracy.

While the proposed changes should help improve emissions data, inaccuracies in the inventories are inherent in the system because the collection process uses inexact methods such as questionnaires, local surveys, emission factors, and modeling. In addition, although EPA can review inventory data, the accuracy of the figures is difficult to verify because of the methods used to collect data and the significant costs required to determine emissions from hydrocarbon sources through the use of air monitors.

Problems With Models

EPA has developed various models for areas to use in ozone planning. To estimate emissions from vehicles, EPA developed a series of models, the

latest of which is called Mobile 4. EPA has also developed models to estimate the percentage of total emissions reduction needed to attain the standard and the specific reductions that will occur from implementing various control measures. According to EPA's proposed policy, the preferred model for estimating the amount of control needed is the Urban Airshed Model, a photochemical grid model. The second acceptable model, called the Empirical Kinetic Modeling Approach (EKMA), is less costly to run and was widely used by states in the 1980s.

Because modeling is not an exact science, estimates from models are uncertain. In our January 1988 report, we state that these uncertainties were exacerbated in the three areas we reviewed because of assumptions used in the models and, in some cases, incorrect data. We also said evaluations of the Urban Airshed and EKMA models showed that results from these models generally varied from actual by plus or minus 30 percent. For the EKMA model this percentage may vary depending on the complexity of the data. In addition, we said that the amount of vehicle emissions estimated in a SIP will vary depending on which mobile model is used. Although uncertainties will continue with the use of models, EPA has made some changes to improve the estimates from the Mobile 4 and EKMA models.

Changes in the Mobile 4 Model

Mobile models use a series of emission factors to estimate evaporative and exhaust emissions, and most recently in Mobile 4, refueling emissions from various types of vehicles.[2] The models are based on actual emissions measurements of vehicles operated by the public and other key data such as vehicle miles traveled and new vehicle replacement rates. Although EPA has not evaluated error factors associated with the mobile models, it continually tests vehicles to gather more emissions data to update the factors in the mobile model. EPA also makes improvements in the model on the basis of user comments as well as other information developed on the vehicle fleet.

The most significant changes in Mobile 4 factors are those for evaporative emissions. The following describes some of the changes in Mobile 4 emission factors and how they affect the emission estimates:

[2]On the basis of a request from the Chairman of the Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce, we plan to examine the adequacy of the testing performed to develop the emission factors and other inputs used in the Mobile 4 model.

- Because of changes in the formulas for diurnal emissions (those that occur when the vehicle is sitting and the temperature rises) and hot soak emissions (those that occur immediately after the vehicle is shut off), evaporative emissions estimates will increase. The new formulas were based on new data showing that trips per day and miles driven per day vary by age of vehicle. Using the new values to get an idea of the impact of the changes, one staff analysis found that evaporative emissions estimates for the model year 1988 were 26 percent higher than previous estimates.
- Unlike earlier models, Mobile 4 will use actual average minimum and maximum temperatures and actual gasoline volatility levels based on the 10 highest ozone days in each nonattainment area.[3] This change will increase emissions estimates, especially in areas where temperatures and volatility levels are high. For example, tests at a temperature of 75 degrees Fahrenheit showed that emissions increased by 5 to 24 percent (depending on the vehicle model year) when volatility levels rose from 9.0 pounds per square inch reid vapor pressure to 11.5 pounds per square inch.
- Based on new vehicle registration data, the new vehicle replacement rate used in Mobile 4 will be lower than the rate used in Mobile 3. According to EPA officials, this means emissions have been understated because a lower replacement rate means a larger number of older vehicles are on the road than assumed in the previous model, and they emit substantially higher levels of pollutants then newer vehicles.

Even with these changes, however, Mobile 4 did not account for all hydrocarbon emissions from vehicles according to EPA officials. They claim that testing had shown that significant evaporative emissions, referred to as "running losses," can occur while vehicles are operating. Neither the earlier mobile models nor Mobile 4 account for these running losses, because the models assume either that emissions do not occur or are captured. As of September 1988, EPA had not developed emission factors to account for running losses because the tests were conducted under worst-case circumstances of high gasoline volatility and high temperatures. However, an EPA official told us additional testing was taking place and factors would be developed before Mobile 4 is finalized in January 1989. Further, the official stated that accounting for running losses would increase hydrocarbon emissions estimates substantially, the exact amount, however, was not yet known.

[3]The volatility of a liquid is a measure of its tendency to evaporate. Reid vapor pressure—the most common measure of gasoline volatility—is a measure of a fuel's vapor pressure when tested at 100 degrees Fahrenheit, which is in the usual range of temperatures found in vehicle fuel tanks during the summer.

Changes in the EKMA Model

Once the emissions inventory is completed, areas can use the EKMA model to estimate the percentage of total emissions reduction needed to attain the standard. According to officials, EPA has made changes to the EKMA model to improve the model's estimate. The newer EKMA version will substitute actual hourly temperatures in an area for the fixed temperatures that were used in the older version. Because temperature variations can affect ozone levels even with constant emission levels, actual temperature data should make the model's estimates more precise. The newer version is also more sensitive to different chemical types and their reactivity, making the model more useful for developing control strategies. Overall, EPA officials estimate that the newer EKMA version will demonstrate a need for greater emissions reduction than the older version. EPA has a contractor comparing the newer version with the older version to determine how much impact the changes will have in terms of additional emission reductions.

EPA is also assisting some ozone nonattainment areas in getting better data on hydrocarbon/nitrogen oxide ratios. These data are used in EKMA to determine the percentage of total hydrocarbon emissions reduction needed to reach the standard. Generally, as the ratio increases, the percentage increases. As we reported in January 1988, the ratios used in the EKMA model for some of the areas' SIPs were lower than subsequent data showed. As a result, the SIPs did not identify enough controls.

Problems With EPA Oversight

EPA's oversight responsibilities in controlling ozone include reviewing and approving SIPs, including the inventory data, reviewing annual progress reports to determine if an area is demonstrating reasonable progress in reducing hydrocarbons to ensure that planned ozone reductions will be met, calling for revisions to SIPs when major deficiencies are identified, and imposing sanctions if requirements are not met. In January 1988, we reported that EPA did not fully carry out its oversight responsibilities in the three areas we reviewed because it took no action or took action that did not correct the deficiencies it had identified in the ozone programs.

EPA regional officials indicated a variety of reasons why more action was not taken to correct the deficiencies identified in the plans. In addition, one regional official identified the need for more specific guidance from EPA. In one area, although it identified a major deficiency in the SIP, EPA did not require revisions because it assumed the area would meet the standard under its existing plan. Further, EPA did not require this area to report on its progress in reducing emissions. EPA identified a

major deficiency in another area, but it did not call for a revised SIP because regional officials believed more data were needed. Finally, the third area did not implement a significant number of control measures and did not identify substitute measures, resulting in inadequate progress toward reducing emissions as planned. In this case, regional officials were reluctant to use sanctions to get more action and could not require substitute measures because the plan did not require substitute measures. On the basis of its experience, the region recommended that the post-1987 policy specify action required when areas do not demonstrate adequate progress in implementing their plans, such as implementing additional control measures, developing a new SIP, or invoking sanctions.

While the proposed ozone policy does not indicate significant changes in EPA's oversight activities, EPA officials believe regional oversight should be improved because the policy is much more prescriptive than past ozone policies, specifying detailed requirements, timetables for meeting the requirements, and actions EPA may take if the requirements are not met. For example, if an area's emissions have not been reduced as planned because some measures have not been implemented, the policy specifically requires that additional measures be submitted within 9 months in a revised SIP and that the needed emissions reduction be made up within 2 years. Further, the policy states that EPA may impose sanctions if an area does not make reasonable efforts to bring about the needed emissions reduction.

Also, to help determine if programs are achieving planned reductions, the proposed policy would establish additional actions that areas must take to evaluate progress. In addition to the annual reporting of reductions in hydrocarbon emissions, areas would also have to compare their emissions reductions from year to year with ozone levels as indicators of the effectiveness of their control programs. Further, areas would be required to prepare a detailed emissions inventory every 3 years and compare it with the base inventory contained in its SIP to determine if the emissions are decreasing as planned. Finally, areas that reach attainment must redemonstrate attainment every 6 years using updated inventory data, modeling techniques, emission factors, and air quality data (for ozone, hydrocarbons, and nitrogen oxides).

Finally, to ensure that the policy is implemented properly once it is finalized, the agency will issue additional guidance documents to

regional offices and state and local air quality agencies at various prescribed stages and at other times on an as needed basis. Guidance documents have been issued on developing emission inventories and EPA plans to issue more guidance on such things as preparing SIPs, developing regulations, and preparing and reviewing annual progress reports. EPA will also hold various workshops on how to implement the policy.

Conclusions

EPA's proposed policy is more prescriptive than past policies and it sets out procedures and requirements that should help to reduce the recurrence of some of the past problems in ozone programs. Most importantly, the policy strengthens evaluation requirements that areas must follow for determining progress in reducing emissions to reach the standard and specifies corrective actions an area must take if planned reductions are not being met. Because of the imprecision associated with ozone planning and control, it is especially important for areas to continually assess their progress and take any necessary corrective steps.

Although the policy is designed to address past ozone problems, as discussed in chapters 2 and 4, there may be significant impediments to implementing and enforcing the policy because of the absence of sufficient legal authority to carry it out, the costs of implementing it, and the feasibility of its proposed annual emissions reduction rate.

Potential Problems With Implementation

Based on public comments on EPA's proposed policy, two of the most formidable problems with implementing EPA's proposed policy are likely to be its high costs and its annual emissions reduction requirement. State and local governments believe that the costs of implementing EPA's policy may prove to be a significant financial burden and could require agencies to divert funds from other important programs. In addition, many state and local governments believe that EPA's proposed annual emissions reduction rate of 3 percent is either difficult to achieve or inequitable. (App. III discusses other implementation issues raised in public comments.)

Post-1987 Policy Will Increase Costs

In its ozone policy, EPA proposes a number of new or expanded requirements for state and local governments. These include

- developing detailed inventories of hydrocarbon emission sources every 3 years that will include detailed data on smaller sources (10 or more tons per year instead of 100 or more) and cover a larger planning area;
- implementing control measures that will require complex planning or review efforts, such as transit system improvements and the use of alternative fuels;
- reviewing the effectiveness of implemented control measures; and
- redemonstrating attainment every 6 years after areas have met air quality standards or while they are attempting to meet the standard.

After issuing its proposed ozone/CO policy for public comment, EPA estimated the costs increases for state and local governments, EPA headquarters, and regional offices to implement the policy. EPA did not identify separate implementation costs for ozone and CO. According to these estimates, for the 5-year period from fiscal year 1989 to fiscal year 1993, the average annual costs for state and local ozone/CO control programs will be about $120.5 million, about 53 percent over the fiscal year 1989 budgeted level of $78.7 million. The annual costs for EPA headquarters and regional offices will average about $41.7 million,[1] 184 percent over the fiscal year 1989 budgeted level of $14.7 million. EPA's estimated cost increases would be for more technical assistance to the states and an increased workload at both headquarters and regional offices. An EPA official stated that the fiscal year 1989 budgeted level

[1]These estimated costs do not include the costs of EPA's Office of Mobile Sources. An official in this office indicated that no estimate was developed for the cost to implement the ozone/CO policy because there was no expectation that additional funding would be provided.

was used as the comparison figure because it is about the same as the current spending level.

EPA developed these costs by identifying each activity or subactivity necessary to implement the ozone/CO policy and by estimating the staff time and contracting costs needed to perform these activities. Staff year figures were converted to costs on the basis of an average salary of $40,000 for state and local personnel and $50,000 for EPA employees.

In the fiscal year 1989 budget, EPA requested an increase of approximately $4.6 million to implement its ozone/CO policy: $2.4 million for grants (Section 105) to the states and $2.2 million for EPA headquarters and regional offices. The $2.4 million increase would restore grant funds to the fiscal year 1987 level of about $95 million. State clean air grant funds were cut from $94.6 million in fiscal year 1987 to $92.7 million in fiscal year 1988 due to governmentwide budget reductions.

These increases in costs may be difficult for some state and local governments to bear. Fifty-seven parties of the 246 parties commenting on EPA's post-1987 ozone policy expressed concern about the financial burden that would be placed upon state and local governments because the policy does not provide for additional federal financial assistance. Some believe that unless EPA provides additional funding, the policy can be implemented only by cutting back on other public needs, including environmental programs such as resource recovery and air quality enforcement.

Three-Percent Annual Emissions Reduction Requirement May Be Difficult to Meet

Another area of concern to state and local governments is EPA's proposed requirement that areas reduce emissions annually by at least 3 percent. To demonstrate "expeditious attainment" all nonattainment areas, except for those that EPA views as being close to meeting the standard, must begin to reduce emissions by 3 percent a year beginning in 1988. The reductions achieved must be in addition to reductions achieved by federally implemented control measures, such as the federal emissions controls on motor vehicles, and state control measures adopted (or required to be adopted) by their current SIPs. According to EPA officials, by not allowing reductions from prior measures to be counted, nonattainment areas are placed on a more even footing. Excluding reductions from federally implemented control measures also prevents some areas from "coasting" over the next few years as federal motor vehicle emissions controls show effects.

According to EPA, the 3-percent reduction rate is technically achievable using available but not yet implemented control measures, some of which have been politically unpopular. Such measures include carpools and other transportation controls. For example, EPA estimates that a basic inspection and maintenance program for motor vehicle tailpipe emissions controls could reduce emissions by 4 percent; 30 of the 68 ozone nonattainment areas have not adopted such a program. EPA is also proposing certain enhancement features, such as testing vehicles now exempt, which it estimates would result in an additional 2-percent reduction. EPA also estimates that applying reasonably available control technology to the largest uncontrolled industrial sources could reduce emissions by another 5 to 6 percent. EPA also has suggested controlling additional sources of hydrocarbon emissions, such as consumer and commercial products that are relatively small sources individually, but are large when considered in the aggregate because of the large number scattered throughout the population. Architectural coatings, industrial maintenance paints, consumer and commercial solvents (hair sprays, cleaners, etc.), and agricultural pesticides are examples of such products, which few areas regulate. EPA estimates reductions of 3 percent to 6 percent by reformulating or controlling up to one-half of all consumer solvents.

As a long-term measure, EPA suggested that areas with serious problems can require motor vehicles to convert from gasoline to other fuels, such as methanol, that emit hydrocarbons that are less reactive and result in lower ozone levels. EPA estimates that areas that require half of their motor vehicles to convert to methanol could realize a 6-percent reduction in emissions.

An OAQPS official explained that the 3-percent rate was not based on a detailed analysis, but that EPA believes it is a reasonable rate because it demonstrates continued progress and would allow the worst area, Los Angeles, about 20 years to reach attainment. However, EPA has hired a contractor to determine how New Jersey, Massachusetts, and the San Francisco Bay Area in California can meet the 3-percent requirement.

Over one-third of the 246 parties who commented on EPA's post-1987 ozone policy expressed concern about the 3-percent annual emissions reduction requirement. Many of these commenters questioned the acheivability of the rate or stated that the rate was an unreasonable burden. Some pointed out, for example, that annual growth in emissions from such sources as increases in vehicle miles traveled would have to be included in the total required reduction in addition to the 3-percent

reduction. Some government agencies also believe that the rate was unfair to areas that have implemented and, in some cases, in their opinion surpassed all reasonably available control measures. These areas would be required to implement difficult, technology-forcing measures requiring greater time and effort to develop and implement, whereas areas that have made little progress in controlling emissions can easily meet the 3-percent requirement by implementing available control measures. Some said that a single rate applied to all areas was unrealistic and that EPA should allow states to establish an appropriate rate for each area based on local conditions.

A few public health and environmental groups claimed that the 3-percent rate was too low because there are control measures available that could reduce emissions by substantially greater proportions.

A recent staff study by the Office of Technology Assessment suggests that while control measures are available for areas to further reduce emissions, a 3-percent annual reduction rate that does not include federal control measures may be too high.[2] The study projected that nonattainment areas could reduce hydrocarbon emissions by about 20 percent by 1993 (based on 1985 emissions), compared with the 15-percent emissions reduction that would be required by the 3-percent rate by that date. However, some of the study's calculated reductions were related to federal control measures, including 6 percent for gasoline volatility, 1 percent for "on-board" controls, and less than 1 percent for tightened tailpipe emissions standards for highway vehicles. However, the study did not analyze transportation control measures and recognized that additional reductions may be possible.

Conclusions

In addition to the question of the legality of EPA's proposed policy, financing its costs would be an issue in its implementation. According to EPA's estimates, the costs to all levels of government would increase; therefore the question becomes how that burden should be shared and the extent to which federal funds may be necessary for the policy to be carried out. EPA and the Congress would clearly have to wrestle with this question as they entered the appropriations process.

The other major issue facing implementation of EPA's policy is its proposed annual emissions reduction requirement. Some argue that the 3-

[2]Urban Ozone and the Clean Air Act: Problems and Proposals for Change, Office of Technology Assessment, April 1988.

percent rate is too high and unfair to areas that have already worked hard to control their air pollution problems. As discussed in chapter 3, EPA believes that a 3-percent rate may be necessary to force states and localities to adopt politically unpopular measures, a problem we pointed out in our January 1988 report. We note, however, that EPA has apparently relied largely on its judgment to determine what the annual rate of reduction should be, rather than on an analysis of what is achievable in different areas. The contract analysis the agency now has underway for three areas should provide a better indication of whether areas can meet the 3-percent a year reduction. In addition to the public comments received on the 3-percent issue, the results of EPA's current analysis should provide a firmer, more defensible basis for whatever annual reduction rate EPA may eventually require.

Legislative Proposals to Address the Ozone Problem

The Congress has been considering three major legislative proposals that are in various stages of development. These proposals would address the ozone problem as well as amending other aspects of the CAA. Senate bill S. 1894 was approved by the Environment and Public Works Committee in October 1987. In the House two legislative proposals are being studied: H.R. 3054, introduced in July 1987, and the so-called "Group of Nine" proposal developed by an ad hoc clean air group consisting of nine congressmen, and initially announced in March 1988.[1] The following discusses various aspects of the three proposals.

Attainment Deadlines

All three proposals would establish different schedules for attainment depending on the severity of an area's ozone problem:

- The Group of Nine proposal defined four classifications—moderate area class I, moderate area class II, serious area and severe area—and extends the attainment dates no later than 3, 7, 9, and 17 years.
- S. 1894 does not specifically classify areas by name but extends the attainment dates by 3, 5, 10, and 15 years.
- H.R. 3054 would have three classifications—moderate health endangerment area, serious health endangerment area, and severe health endangerment area—with attainment dates of 3, 5, and 10 years after the legislation is enacted.

Planning Requirements

Each of the three proposals would require areas to submit revised SIPs; the Group of Nine proposal, however, would exempt areas that can meet the standard within 3 years. The time allowed for submitting the revisions range from 9 months under H.R. 3054 to about 3 years under the Group of Nine proposal. All three proposals would require areas submitting SIPs to use current inventories of emissions or to update the inventories.

Control Measures

All three proposals would establish national controls limiting emissions from sources such as consumer and commercial solvents and from architectural and traffic marking coatings. S. 1894 and H.R. 3054 would also include emissions from pesticide applications.

[1]The Group of Nine proposal was recently introduced in the Congress on October 5, 1988, as H.R. 5469.

In addition, all three proposals would require controls to reduce emissions from motor vehicles by

- lowering the standards that limit hydrocarbon tailpipe emissions from passenger cars and light duty trucks;
- lowering the standards that limit nitrogen oxide tailpipe emissions from passenger cars and light duty trucks;
- requiring all light duty motor vehicles to have on-board controls to recover hydrocarbon emissions from refueling motor vehicles at gasoline service stations;[2] and
- limiting gasoline volatility levels.

Further, the proposals would require EPA to develop additional control technique guidelines (CTGs) on uncontrolled emission sources. For example, S. 1894 lists 11 categories of emission sources, such as bakeries, wood furniture coating facilities, and autobody refinishing facilities, and requires EPA to issue CTGs no later than 2 years after enactment. H.R. 3054 requires EPA to identify and issue four CTGs per year on 12 categories of uncontrolled sources believed to contribute most to ozone formation. The Group of Nine proposal would require EPA to develop CTGs within 2 years for 11 categories of uncontrolled sources.

Sanctions

All three proposals would continue to use economic sanctions now in the CAA for failure to comply with planning and control requirements, including withholding highway funds and prohibiting construction of sources increasing pollution. While there are similarities among the proposals, they do differ somewhat on when sanctions apply and the type of sanction. For example, for failure to submit a revised plan on time, the Group of Nine proposal would impose a construction ban on stationary sources emitting 50 tons or more of hydrocarbons, while S. 1894 would impose a ban on such sources emitting 25 tons or more. H.R. 3054 would require the withholding of highway funds in nonattainment areas for failure to submit a revised plan on time.

In addition, the three proposals would assess monetary emissions penalties. The Group of Nine proposal would assess a noncompliance penalty of $2,000 per ton of emissions on all stationary sources emitting 25 or

[2]The Group of Nine proposal, however, states that if the EPA Administrator finds that on-board controls are not feasible or desirable then equipment should be installed at the gasoline pumps to recover refueling emissions in all nonattainment areas.

more tons of hydrocarbons if a disapproved SIP is not brought into compliance within 4 years.

S. 1894 also has excess emissions penalties that would apply to major stationary sources that did not meet specified emission reduction requirements. The fee would be assessed on a per ton basis up to the cost of controlling the emissions or the economic benefit the source received from not controlling emissions, but not less than $5,000 per ton. S. 1894 would also impose an emissions fee of not less than $100 per ton on all stationary sources emitting hydrocarbons or nitrogen oxides in nonattainment areas starting no later than January 1, 1993.

H.R. 3054 would require emissions penalties under two conditions. First, in the most severely polluted areas, an emissions fee will be assessed after January 1, 1990, against each source that has volatile organic compound[3] or nitrogen oxide emissions of 25 tons or more per year. In addition, if EPA does not issue CTGs on the 12 categories, in accordance with the bill, an emissions fee of $5,000 per ton would be applied to each source in the 12 categories emitting 10 or more tons per year of hydrocarbons or nitrogen oxides. The fee would apply to each ton emitted and would commence after January 1, 1991.

[3]Volatile organic compounds include methane hydrocarbons and nonmethane hydrocarbons. Since methane is considered only negligibly reactive in ambient air, the volatile organic compounds of importance as oxidant precursors are called nonmethane hydrocarbons often referred to as hydrocarbons.

Use of Models in Developing Air Quality Control Strategies

Traditionally, models have been used in the ozone planning process to estimate hydrocarbon emissions reduction needed to reach the ozone standard and to estimate the impact of control measures. The use of models has been controversial because of the uncertainties surrounding modeling estimates and because of costs. In his January 27, 1988, letter, the Chairman of the Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce, asked us to comment on those aspects of H.R. 3054 which seek to avoid the use of modeling and which were reportedly based on recommendations of the State and Territorial Air Pollution Program Administrators and the Association of Local Air Pollution Control Officials.

In recommendations to amend the Clean Air Act, the two associations suggested that a technology-based strategy be substituted for the current SIP process, which includes inventorying emission sources, estimating the percentage of total emissions reduction needed to meet the standard by modeling, identifying control measures to meet the needed reductions, and implementing those control measures. Under a technology-based approach, all areas of the country would be classified, according to ozone monitoring data, into three categories—attainment, moderate nonattainment, and severe nonattainment—with a specific set of control measures mandated for each classification to ensure maintenance and attainment of the standard. If a moderate area does not reach attainment by the specified date, it would be reclassified as a severe area and would then have to adopt the additional specified control measures.

Because the current SIP process is resource intensive and has generally underestimated the amount of controls needed, due in part to the inaccuracies in modeling estimates, the two associations believe time and resources could be better utilized by implementing control measures immediately under a technology-based approach rather than planning for 1 or 2 years.

While H.R. 3054 says states shall not be required to use air quality models to demonstrate compliance with the standard, it does not eliminate the need for modeling. The bill calls for EPA to specify the annual percentage emissions reduction each area must achieve to attain the standard by the mandated deadline. As long as this requirement exists, it would seem modeling is necessary. The only way EPA can estimate percentages of emissions reduction needed is through modeling.

Also, H.R. 3054 would require modeling in dealing with ozone transport problems. The bill requires EPA to establish criteria for determining the amount of ozone that is transported from one area to another. The bill states that the criteria should require the best available air quality monitoring and modeling techniques.

Finally, as discussed in appendix III, some of the parties commenting on the proposed policy suggested that EPA eliminate or reduce the use of modeling. A few suggested that a technology-based approach be used in place of modeling.

Public Comments on EPA's Proposed Ozone Policy

EPA received 246 statements concerning the ozone portion of its proposed post-1987 ozone/CO policy, most of them from state and local government agencies.[1] (See table III.1.) Apart from those implementation issues discussed in chapter 4, the following sections summarize the public comments covering EPA's proposed effectiveness rule, timetables, planning area sizes, sanctions, federal control measures, and modeling.

Table III.1: Types of Organizations Providing Comments on EPA's Proposed Post-1987 Ozone Policy

Organizations	Number of parties
State transportation/highway agencies and commissions	28
State environmental/health agencies	29
State legislators	8
Local governments and local air pollution control agencies	36
Local planning organizations: metropolitan planning organizations, councils of government	38
Federal agencies and officials	19
Industrial associations and companies	46
Individuals	25
Health, environmental, and other organizations	17
Total	**246**

Proposed Effectiveness Rule

Fifty-one parties questioned the reasonableness of EPA's proposed requirement to limit assumed emission control effectiveness to 80 percent rather than allowing states to assume 100-percent effectiveness, as in the past. EPA believes that one reason ozone levels have not declined as much as expected is that reductions from control measures have not been as high as projected. EPA is therefore proposing to allow a state to assume a higher than 80-percent effectiveness rate only if it can demonstrate greater effectiveness.

About one-half of those commenting on this proposal claimed that the 80-percent requirement was arbitrary or not supported. Some suggested that EPA should be responsible for identifying regulations that are less than 100 percent effective or that EPA should evaluate regulations during its audits of state air pollution control programs. Some stated that the required effectiveness evaluations of rules were too costly given the

[1] Although EPA documented the receipt of 285 statements on its post-1987 ozone/CO policy (52 F.R. 45044, November 24, 1987), these included 8 duplicate statements, 12 statements that discussed the CO problem only, and 19 statements that only requested extension of the comment period.

reductions expected to be achieved. Two national associations of air pollution control agencies stated that "the time-consuming, resource-intensive [evaluation] required if a state wishes to contest the assumed level of effectiveness for any given regulation places an inordinate and, in some cases, impossible burden on states."

Reasonableness of Timetables

Parties offered a variety of comments concerning the reasonableness of time the policy would allow to complete certain requirements, such as the 2-year planning period from EPA's call for a SIP revision to submission of the revision to EPA, the time given for submission of the initial draft inventory (12 months after SIP call), and the time allowed for submission of an updated inventory every third year (9 months after the end of the third year).

Of the 17 parties commenting on the planning period, 10 indicated that the states should be given more time, 5 claimed the states were given too much time, and 2 indicated that the 2 years was reasonable. Five of the 10 believed that areas needed more time in order to use the Urban Airshed Model. In addition, 11 commenters (most were individuals) claimed that EPA's policy allowed too much delay in attaining the ozone standard, and 8 believed that the policy did not provide enough time to complete the initial and updated inventories.

Expansion of the Planning Areas

Fifty-nine parties disagreed with EPA's proposal to expand the planning area to the entire Metropolitan Statistical Area or Consolidated Metropolitan Statistical Area (MSA/CMSA), instead of limiting it to the area that exceeds air quality standards. According to EPA's proposed policy,

> "By definition, a MSA contains a large urban center together with adjacent communities that have a high degree of social and economic integration with that population center. Counties included within an MSA have similar population densities and percentages of commuters to the urban core and, hence, large transportation systems and associated vehicular emissions."

EPA believes that attainment of the ozone standard in these urban cores may not be fully met unless vehicular emissions as well as stationary source emissions originating from all counties within the MSA/CMSA are included in the control strategy.

Many commenters were opposed to expanding the present air basins in California that were established on the basis of air currents, weather,

and topography of the area. Some questioned using MSAs/CMSAs in western states because of their large counties and the significant portion of rural areas within the counties. Some commenters noted the difficulties in coordinating with more organizations in the expanded planning areas and the additional costs to expand inventories. Thirteen of those objecting to the expanded planning areas specifically disagreed with the inclusion of Kenosha County, Wisconsin, in the Chicago planning area. The parties expressed concern that restrictions would be placed on Kenosha affecting its growth when the problem is the lack of an effective ozone program in Illinois. Nine commenters agreed with expanding the planning area, but five of them believed that, unlike EPA's proposal, all areas in the MSA/CMSA should be required to implement the same controls as the urban areas.

Thirty commenters raised objections to the EPA proposal to include in an area's inventory, large sources within the 25 mile area surrounding the MSA/CMSA, citing a number of different reasons, including the lack of authority to control such sources.

In a June 6, 1988, proposed rulemaking on the designation of attainment status (53 FR 20722), EPA said it would consider alternatives to MSA/CMSA as the planning area for ozone. EPA therefore requested comments on the criteria to be used in defining an alternative planning area.

Use of the Highway Funds Sanction

Eighty-seven parties commented on EPA's proposed use of sanctions in the post-1987 ozone policy, primarily on EPA's application of the highway funds sanction. Forty-six commenters, primarily state transportation agencies and local planning agencies, disagreed with EPA's contention that the highway funds sanction is available in the post-1987 period, some of them mentioning our legal decision of February 28, 1986 (B-221421), as support. Some commenters said that the highway funds sanction was counterproductive because highway projects generally result in improved traffic flow and reduced emissions. Only four parties agreed with EPA's use of the highway funds sanction in the post-1987 period.

The following were comments on EPA's sanctions policy:

- Nineteen parties were concerned about EPA's policy to automatically apply construction bans on areas with long-term ozone problems, some noting that the policy would encourage areas to develop unrealistic SIPs, as has been done in the past.

- Twelve parties agreed with EPA that sanctions should not be applied against areas that did not attain the standard by the required date but should be applied only to those that fail to develop and submit SIPs or fail to implement required control measures.
- Six parties believed that EPA should apply sanctions against jurisdictions within an MSA/CMSA that do not implement required controls and not against the entire MSA/CMSA.

As discussed in chapter 2, we continue to believe that the highway funds sanction is not available to EPA in the post-1987 period.

Use of Federal Control Measures

About one-third of all those commenting believed that EPA needed to implement various additional control measures at the federal level. EPA's proposed policy summarized various federal control initiatives currently under consideration and requested comments on other measures it should consider.

In the case of mobile sources, 59 people recommended that EPA implement one or more of the following federal control measures:

- Reducing motor vehicle emissions during refueling with onboard controls.
- Reducing volatility of fuels to control evaporative emissions.
- Setting more stringent hydrocarbon exhaust emissions standards for motor vehicles.
- Enhancing inspection and maintenance programs for motor vehicles.

In addition, 34 commenters suggested that EPA regulate hydrocarbon emissions from various consumer and commercial products, including commercial paints, architectural coating materials, industrial maintenance coatings, adhesives, and consumer solvents (hair sprays, deodorants, etc.). Some of the commenters said federal regulation was necessary because these products are manufactured and marketed throughout the nation and regulating them on an area-by-area basis would be difficult.

Approximately half of those who commented on federal controls suggested that EPA define reasonably available control technology and issue CTGs for the largest remaining uncontrolled stationary source categories, such as wood furniture coating and autobody refinishing plants, waste treatment, storage and disposal facilities, sewage treatment plants, bakeries, and vapor recovery systems on gas pumps. These commenters

believed that EPA-developed CTGs were preferable to state or local ones because (1) it is more efficient to have EPA develop requirements than for each state to do so, (2) EPA-developed CTGs would be more consistently applied, and (3) states have faced fewer difficulties and have had more success with EPA-developed CTGs.

As summarized in appendix I, three major legislative proposals addressing the ozone problem would direct EPA to implement a number of these control measures.

Uncertainties Associated With Modeling

The accuracy of models was another area of concern raised in public comments. Thirty-five people were concerned about inaccuracies in previously used models and about the limitations of the EKMA model. Some suggested that EPA eliminate or reduce the use of modeling and require plans to be developed on a technology-based approach in which controls would be imposed on the largest remaining uncontrolled source categories. Some of those concerned about the limitations of the EKMA model suggested that nonattainment areas should be required to use the Urban Airshed Model. According to EPA's proposed policy, the Urban Airshed Model is the preferred model for estimating the amount of emission reduction needed to attain the standard, and the EKMA model is an acceptable alternative. As discussed in chapter 3, EPA has made some changes to improve the emissions reduction estimates from the EKMA model.

Major Contributors to This Report

Resources, Community, and Economic Development Division, Washington, D.C.	Richard L. Hembra, Associate Director, (202) 252-0600 William F. McGee, Group Director Larry A. Goldsmith, Evaluator-In-Charge Ronald G. Morgan, Evaluator Donna J. Hubbard, Secretary
Office of General Counsel	Margie Armen, Senior Attorney

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