



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

**Resources, Community, and  
Economic Development Division**

B-265756

September 22, 1995

The Honorable Joe L. Barton  
Chairman, Subcommittee on Oversight  
and Investigations  
Committee on Commerce  
House of Representatives

Dear Mr. Chairman:

This report responds to your request that we provide you with information on maximum achievable control technology (MACT) standards under title III of the Clean Air Act Amendments of 1990. Specifically, the report discusses (1) the Environmental Protection Agency's (EPA) progress in issuing MACT standards and (2) the costs and benefits identified by EPA in the regulatory impact analyses for three MACT standards and one proposed standard, as agreed with your office.

BACKGROUND

The Clean Air Act Amendments of 1970 required EPA to identify and regulate hazardous air pollutants to protect public health. Over the next 20 years, EPA issued seven such regulations. To speed up the process, the Congress listed 189 hazardous air pollutants, such as lead, benzene, and mercury, in title III of the 1990 amendments and required EPA to determine which industries emitted these pollutants and to issue technology-based MACT standards to control the emissions. EPA subsequently identified 174 industries that emit one or more of the 189 air pollutants. Accordingly, EPA is required to issue 174 separate MACT standards. Title III also included a schedule for EPA to issue these standards, with deadlines of 2, 4, 7, and 10 years after the enactment of the act. EPA was required to issue 40 of the standards by November 15, 1992, and an additional 25 percent by the 1994 and 1997 deadlines, with all standards being completed by the 10-year deadline.

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After EPA failed to meet the deadlines for issuing the 1992 standards and proposing the 1994 standards, as specified in the 1990 amendments, the Sierra Club and the Natural Resource Defense Council sued the agency to force it to comply with a number of the requirements of the 1990 amendments, including the deadlines for the MACT standards. In a March 21, 1994, consent decree, the U.S. District Court for the District of Columbia established revised deadlines for EPA to issue the standards. The revised dates were between February 1994 and March 1996. EPA, subsequently, identified 45 specific source categories for which it planned to issue standards. In addition, EPA is required by the 1990 amendments to issue the remaining 129 standards by the 1997 and 2000 deadlines.

STATUS OF EPA'S EFFORTS  
TO ISSUE MACT STANDARDS

As of August 28, 1995, EPA had met the specified dates for issuing 26 of the 45 standards and had proposed to issue standards for the other 19.<sup>1</sup> According to EPA officials, the agency expects to meet all of the specified dates for issuing the 45 standards. Furthermore, EPA plans to meet the 1997 and 2000 deadlines for issuing the remaining 129 standards. Enclosure I provides additional details on the 26 standards that have been issued, and enclosure II provides information on the proposed 19 standards.

SUMMARIES OF REGULATORY IMPACT  
ANALYSES FOR SELECTED MACT STANDARDS

In an attempt to reform the regulatory process and make it more efficient, the President, in September 1993, issued Executive Order 12866 to require all federal agencies to assess the costs and benefits of all regulations that are estimated to cost \$100 million or more. EPA conducts these assessments through regulatory impact analyses. Among other topics, these assessments identify the one-time capital and annual costs and the environmental and economic benefits of implementing the rules. According to EPA, the agency is not always able to quantify all of the benefits of MACT standards because of limitations in the available data. Furthermore, the assessments identify the number of facilities that are impacted by the rule as well as the number of facilities that may close because of implementing

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<sup>1</sup>The specified dates are based on court orders and extensions of court orders, which were imposed after EPA failed to meet the statutory deadlines.

the requirements. The following sections summarize the costs and benefits identified for three of the MACT standards and one proposed standard.<sup>2</sup>

Hazardous Organic National Emissions Standards for Hazardous Air Pollutants

The Hazardous Organic National Emissions Standards for Hazardous Air Pollutants standard, which was issued in April 1994, regulates about 370 chemical manufacturing facilities in the United States. According to EPA, this standard represents potentially the greatest emissions reduction likely to be achieved by any category of sources that will be regulated under title III. EPA estimates that the standard will cost about \$450 million in one-time capital expenditures and about \$230 million in annual costs. EPA projects that the costs will result in chemical prices' increasing by almost 4 percent but that no facilities will likely be closed because of this standard. The estimated environmental benefits of the standard are reduced emissions of 510,000 tons of organic air pollutants and over 1 million tons of volatile organic compounds (VOC), which are primary contributors to ground-level ozone. Because of the lack of information on individual chemicals, such as the quantity and location of emissions, the regulatory impact analysis did not quantify all the benefits of the standard, such as fewer cases of cancer. Enclosure III provides additional cost and benefit data for this standard.

Petroleum Refinery

The petroleum refinery standard, which was published in August 1995, will regulate 192 refineries in the United States and reduce emissions of hazardous air pollutants and VOCs. EPA estimates that the standard will cost about \$213 million in one-time capital costs and about \$79 million in annual costs. The increased costs are expected to result in slightly higher prices for refinery products (0.2 to 0.5 percent), decreased refinery outputs (0.1 to 0.5 percent), and the possible closure of a limited number of refineries. EPA estimates the annual benefits of the rule to be over \$150 million from decreased acute health problems and increased agricultural yields due to lower ozone levels. Enclosure IV provides additional cost and benefit data for this standard.

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<sup>2</sup>We did not evaluate EPA's methodology for projecting the cost and benefit data in the regulatory impact analyses.

Coke Oven Batteries

EPA initially proposed the coke oven batteries standard in 1987 but decided to put it on hold because of anticipated changes to the Clean Air Act.<sup>3</sup> The standard, which was developed with the consensus of industry, states, environmental organizations, and other interested parties, was issued in October 1993. The standard regulates emissions of particulate matter and organic gases, such as benzene, arsenic, and beryllium. Existing coke oven batteries must comply with the MACT standard by December 1995. However, facilities that meet certain voluntary controls for reducing emissions have until January 2020 to fully comply with the MACT standard. To qualify for the deferred compliance, coke oven operators were required to achieve certain short-term emissions reductions by November 1993. In addition, to qualify for the delay in complying with the standard, the operators must meet other emissions control standards to attain the lowest achievable emissions rates by January 1998. EPA estimates that the standard will cost about \$66 million in one-time capital costs and about \$25 million in annual costs. Furthermore, if the operators elect to meet the standard for the lowest achievable emissions rates, the estimated one-time capital costs are \$510 million, and annual costs are about \$84 million. EPA also predicts that three facilities could close as a result of this standard. The annual benefits of reduced mortality, morbidity, and household soiling<sup>4</sup> due to reduced emissions of particulate matter and organic gases are estimated to be between \$3.3 million and \$20.7 million. Enclosure V provides additional cost and benefit data for this standard.

Pulp, Paper, and Paperboard

The pulp, paper, and paperboard standard, which was proposed in December 1993, will regulate the emissions of hazardous air pollutants, VOCs, and sulfur from 565 facilities in 42 states. Unlike the other standards, which control or will control the emissions of air pollutants, this one will reduce the emissions of pollutants via two

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<sup>3</sup>Coke oven batteries are furnaces with common sidewalls that convert coal into coke, a fuel that is used in the production of iron.

<sup>4</sup>Household soiling is the deposition of particulate matter emissions from coke ovens in homes, which increases the time and cost of house cleaning.

media--air and water. EPA estimates that the combined costs for reduced emissions in both media will be about \$600 million and that the combined benefits will range between \$160 million and \$987 million. The regulatory impact analysis projects that as many as 11 to 13 plants would face closure, resulting in 2,800 to 10,700 lost jobs. The standard also estimates a reduction of 5 to 35 cases of cancer per year but does not attach a monetary value to this benefit. Numerous comments have been presented to EPA on the proposed standard, including extensive new data submitted by the industry. According to EPA officials, the agency is performing additional analysis of the new data and plans to announce the availability of the analysis and to solicit public comments by December 1995. According to EPA, changes to the standard, affecting the portions concerning air and water pollutants, are expected to result from this analysis. In view of EPA's continuing analysis, we are not including an enclosure that shows additional costs and benefits for this standard.

AGENCY COMMENTS

We provided copies of a draft of this report to EPA for its review and comment. We met with EPA officials, including the Director, Emissions Standards Division, Office of Air Quality Planning and Standards, Office of Air and Radiation, who generally agreed with the information in this report. EPA provided a few clarifications, which we have incorporated where appropriate.

SCOPE AND METHODOLOGY

In conducting our work, we obtained documentation and interviewed officials from EPA's Office of Air Quality Planning and Standards on the status of the agency's efforts to issue MACT standards. We selected three standards and one proposed standard on the basis of input from your staff and the potential impact of the standards. We reviewed the regulatory impact analyses and final regulations for the standards and summarized the cost and benefit data in these documents.

We conducted our work from June through September 1995 in accordance with generally accepted government auditing standards.

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As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to the Administrator of the Environmental Protection Agency and other interested parties. We will also make copies of the report available to others upon request.

Please contact me at (202) 512-6111 if you or your staff have any questions.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'Peter F. Guerrero', with a long horizontal flourish extending to the right.

Peter F. Guerrero  
Director, Environmental  
Protection Issues

Enclosures - 5

MACT STANDARDS ISSUED  
(as of August 28, 1995)

<b>MACT standard</b>	<b>Number of source categories</b>	<b>Statutory date</b>	<b>EPA's planned issue date<sup>a</sup></b>	<b>Issue date</b>
Dry cleaning	5	11/15/92	09/13/93	09/13/93
Hazardous organic pollutants	1	11/15/92	02/28/94	02/28/94
Chromium electroplating	6	11/15/94	11/23/94	11/22/94
Coke oven batteries	1	12/31/92	10/27/93	10/23/93
Commercial sterilizers	2	11/15/94	11/23/94	11/22/94
Degreasing organic cleaners	2	11/15/94	11/15/94	11/15/94
Industrial cooling towers	1	11/15/94	07/31/94	07/30/94
Magnetic tape	1	11/15/94	11/23/94	11/22/94
Polymers & resins II	2	11/15/94	02/28/95	02/28/95
Stage I gasoline market	1	11/15/94	11/23/94	11/23/94
Aerospace industry	1	11/15/94	07/31/95	07/31/95
Marine vessels	1	11/15/92	07/29/95	07/29/95
Petroleum refineries	1	11/15/94	07/28/95	07/28/95
Secondary lead smelters	1	11/15/94	05/31/95	05/31/95
<b>Total</b>	<b>26</b>			

Note: Maximum achievable control technology (MACT).

<sup>a</sup>EPA's planned issue dates are based on court orders, extensions of court orders, and internally set priorities.

MACT STANDARDS NOT YET ISSUED  
 (as of August 28, 1995)

<b>MACT standard</b>	<b>Number of source categories</b>	<b>Statutory date</b>	<b>EPA's planned issue date*</b>
Off-site waste treatment	1	11/15/94	11/15/95
Printing/publishing	1	11/15/94	03/15/96
Polymers & resins I	9	11/15/94	05/15/96
Polymers & resins IV	6	11/15/94	03/15/96
Shipbuilding	1	11/15/94	11/15/95
Wood furniture	1	11/15/94	11/15/95
Total	19		

\*EPA's planned issue dates are based on court orders, extensions of court orders, and internally set priorities.



SUMMARY OF COSTS AND BENEFITS OF THE HAZARDOUS ORGANIC NATIONAL  
EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS MACT

Dollars in millions

	Costs		Benefits and impacts	
	One-Time	Annual		
Hazardous Organic National Emissions Standards for Hazardous Air Pollutants	\$450	\$230	<b>Annual environmental benefit:</b> Reduction of • organic air pollutant emissions • VOC emissions Improved health and welfare benefits are not quantified	510,000 tons 1 million tons Data not available
			<b>Annual economic impact:</b> • increase in price of chemical compounds • decrease in output of chemical compounds • number of chemical manufacturers closing	0.1% - 3.9% 0.1% - 4.0% None

Note: Volatile organic compounds (VOC).

SUMMARY OF COSTS AND BENEFITS OF THE PETROLEUM REFINERY MACT

Dollars in millions

	Costs		Benefits and impacts	
	One-time	Annual		
Petroleum refinery standard	\$213	\$79	<b>Annual environmental benefit:</b> Reduced emissions of hazardous air pollutants and VOCs	60%
			<b>Annual economic benefit:</b> • VOC reductions • increased agricultural yields	\$108.5 \$44.9
			<b>Annual economic impact:</b> Cost to society due primarily from increases in price of refined petroleum products, decreases in output levels, changes in domestic shipments, and possible refinery closures	\$95

SUMMARY OF COSTS AND BENEFITS OF THE COKE OVEN BATTERIES MACT

Dollars in millions

	Costs		Benefits and impacts	
	One-time	Annual		
Coke oven batteries standard (MACT)	\$66	\$25	<b>Annual environmental benefit</b> Reduced emissions Benefits from reduced	80 - 98%  \$2.8 - \$14.7 <\$0.1 - \$2.9 <\$0.1 - \$0.4
			<b>Annual economic impact:</b> • increase in price of furnace coke • increase in price of foundry coke • facility closings	0.2% 1.1% 0
Coke oven batteries standard for the lowest achievable emissions rates (Costs for the MACT standard are included in the costs for this standard.)	\$510	\$84	<b>Annual environmental benefit:</b> Reduced emissions Benefits from reduced	90%  \$3.2 - \$17.0 <\$0.1 - \$3.0 <\$0.1 - \$0.4
			<b>Annual economic impact:</b> • increase in price of furnace coke • increase in price of foundry coke • facility closings	0.7% 2.5% 3

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