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Clean Air Act Issues in the 110th Congress: Implementation and Oversight

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Summary

Broad questions regarding the science underlying new ambient air quality standards, the role of federal versus state governments in controlling air pollution, and the appropriateness of economic versus regulatory approaches to controlling emissions are underlying issues as the 110th Congress begins oversight of the Clean Air Act. Oversight hearings are expected early in the new Congress. Specific issues include whether the EPA's new standards for ambient concentrations of fine particulates and its soon-to-be-proposed standards for ozone adequately reflect the state of the science; whether the EPA's recently announced changes in the process for setting ambient air quality standards politicize what traditionally have been scientific judgments; and how best to control emissions of mercury and other pollutants from electric power plants. To some extent, the issues overlap the debate regarding control of greenhouse gases, which is also expected to be the subject of hearings early in the new Congress. Amendments to the Clean Air Act or directives to the EPA through its appropriations may be considered. In addition, the executive and judicial branches and the states are expected to take action on air issues in the coming year.

On October 17, 2006, EPA Administrator Stephen Johnson promulgated revisions to the National Ambient Air Quality Standards (NAAQS) for particulate matter (PM). The new standards will cut the allowable concentration of fine particles (known as $PM_{2.5}$) in the air averaged over 24-hour periods almost in half, avoiding several thousand premature deaths annually. The Administrator left unchanged a separate *annual* standard for fine particles, despite the recommendation of his independent scientific advisory committee (CASAC) that the annual standard also be reduced. The EPA has recently announced changes to the *process* by which NAAQS are set that appear to downgrade the role of CASAC in any future NAAQS-setting. The Administrator is not required by statute to follow CASAC's recommendations. Thus, whether CASAC's role should be changed — either as the EPA recently announced or, by contrast, to strengthen its statutory role — might be at issue in the new Congress.

The regulation of mercury and other pollutants from coal-fired electric power plants is another issue of congressional concern. In 2005, the EPA promulgated new regional cap-and-trade requirements for mercury, sulfur dioxide, and nitrogen oxides from power plants, after the Senate Environment and Public Works Committee did not approve legislation (the Clear Skies Act, S. 131) that would have established similar requirements nationally and modified existing clean air regulations. About 20 states have chosen to proceed with mercury standards stronger than those EPA promulgated, and many health and environmental groups would like to see EPA's rules made more stringent. The costs and benefits of various levels of control, the availability of control technology, and legal issues related to the promulgated standards are among the issues faced by Congress, the courts, and the EPA.

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Introduction

Despite steady improvements in air quality in many of the United States' most polluted cities, the goal of clean air continues to elude many areas. The most widespread problems involve ozone and fine particles. As of March 2006, 158 million people lived in areas classified "nonattainment" for the ozone National Ambient Air Quality Standard[1]; 88 million lived in areas that were nonattainment for fine particles ($PM_{2.5}$).[2]

Air quality has improved substantially since the passage of the Clean Air Act in 1970: annual emissions of the six most widespread ("criteria") air pollutants have declined 160 million tons (53%), despite major increases in population, motor vehicle miles traveled, and economic activity.[3]

Meanwhile, however, scientific understanding of the health effects of air pollution has caused the EPA to tighten standards for ozone and fine particles. (Fine particles, as defined by the EPA, consist of particulate matter 2.5 micrometers or less in diameter, abbreviated as $PM_{2.5}$.) The agency attributes at least 33,000 premature deaths and millions of lost work days annually to exceedances of the $PM_{2.5}$ standard. Recent research has begun to tie ozone pollution to premature mortality as well. Thus, there is continuing pressure to tighten air quality standards: a tightening of the standard for fine particles was promulgated October 17, 2006. Ozone standards are scheduled for review in 2007, with new standards to be proposed by May and a final decision due by February 2008. In addition to the standards themselves, attention has focused on the major sources of ozone and particulate pollution, such as coal-fired power plants and mobile sources.

With this background in mind, this report provides a discussion of several interrelated air issues of interest in the 110th Congress, including revision of the particulate standards, the role of independent scientific review in the setting of air quality standards, multi-pollutant legislation for electric power plants, mercury from power plants, and New Source Review. This report provides an overview of these

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[1] Data for ozone nonattainment areas are from the U.S. EPA "Green Book," at [http://www.epa.gov/oar/oaqps/greenbk/gntc.html].

[2] Data for $PM_{2.5}$ nonattainment areas are also from the U.S. EPA "Green Book," at [http://www.epa.gov/oar/oaqps/greenbk/qntc.html].

[3] See U.S. EPA, "Air Emission Trends — Continued Progress Through 2005," at [http://www.epa.gov/airtrends/econ-emissions.html].

issues; CRS reports that contain additional information and detailed sources are referenced in the appropriate sections.

Revision of the Particulate Standards

On September 21, 2006, EPA Administrator Stephen Johnson signed revisions to the National Ambient Air Quality Standards (NAAQS) for particulate matter. (The standards appeared in the *Federal Register* on October 17.[4]) In developing the revisions, the EPA reviewed 2,000 scientific studies on particulates and found associations between particulates and numerous significant health problems, including aggravated asthma, chronic bronchitis, reduced lung function, irregular heart beat, heart attacks, and premature death in people with heart or lung disease.

The revisions will strengthen the pre-existing standard for particulate matter 2.5 micrometers or less in diameter (known as fine particles, or $PM_{2.5}$), but the standard has not been strengthened to the degree recommended by the agency's staff or scientific advisors. As shown in **Table 1**, the new standard cuts the allowable concentration of $PM_{2.5}$ in the air averaged over 24-hour periods from 65 micrograms per cubic meter ($\mu g/m^3$) to 35 $\mu g/m^3$; the annual standard, set at 15 $\mu g/m^3$, does not change.

EPA's professional staff and the Clean Air Scientific Advisory Committee (CASAC), a group established by the Clean Air Act to provide independent scientific advice to the Administrator, had recommended more stringent standards. CASAC endorsed a 24-hour standard in the range of 30 to 35 $\mu g/m^3$ and an annual standard in the range of 13 to 14 $\mu g/m^3$. Of the 22 CASAC panel members, 20 concurred in the recommendation.[5]

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[4] 71 *Federal Register* 61144. Extensive information related to the standards, including an eight-page fact sheet explaining the standards, and maps and charts with background material, is available at [http://epa.gov/pm/actions.html].

[5] By statute, CASAC consists of seven members chosen by the EPA Administrator. To review the NAAQS for a specific pollutant, CASAC forms a panel that includes as many subject experts as CASAC deems appropriate, in addition to the seven statutory CASAC members. Thus, the PM panel had 22 members.

Table 1. Pre-existing, Recommended, and New NAAQS for $PM_{2.5}$

	Annual Standard	24-Hour Standard
Pre-existing Standards[a]	15 μg/m^3	65 μg/m^3
EPA Staff Recommendation	15 μg/m^3 and mid to lower end of 25-35 μg/m^3 OR 12-14 μg/m^3 and mid to lower end of 30-40 μg/m^3	
CASAC Recommendation	13 to 14 μg/m^3	30 to 35 μg/m^3
Administrator's Decision	15 μg/m^3	35 μg/m^3

a. Although these standards were promulgated in 1997, they are only now coming into effect, because of legal challenges, the need to establish a monitoring network, and various administrative factors. For additional information on implementation of the current standard, see CRS Report RL32431, *Particulate Matter (PM2.5): National Ambient Air Quality Standards (NAAQS) Implementation*, by Robert Esworthy.

In the Administrator's judgment, the science underlying this recommendation was not sufficient, relying primarily on two studies, neither of which "provide[s] a clear basis for selecting a level lower than the current standard...."[6] The Administrator agrees with CASAC that the science shows a relationship between higher levels of $PM_{2.5}$ and an array of adverse health effects, but he believes there is too much uncertainty in the analysis to justify lowering the annual standard.[7] He also noted that the EPA is undertaking substantial research to clarify which aspects of PM-related pollution are responsible for elevated risks of mortality and morbidity, including a multi-million-dollar research program whose timeline should permit the results to inform the Agency's next periodic reevaluation of the $PM_{2.5}$ standard, required by statute within five years. Thus, he concluded, "...it would be wiser to consider modification of the annual standard with a fuller body of information in hand than initiate a change in the annual standard at this time."[8]

The PM NAAQS also addresses slightly larger, but still inhalable, particles in the range of 10 to 2.5 micrometers. These are referred to as *thoracic coarse particles*, or $PM_{10\text{-}2.5}$. In its last review of the particulate standards (in 1997), the EPA had regulated these as particles 10 microns or smaller (PM_{10}), a category that overlapped the $PM_{2.5}$ category. Challenged in the D.C. Circuit Court of Appeals, the PM_{10} standard was remanded to the EPA, the court having concluded that PM_{10} is a "poorly matched indicator" for thoracic coarse particles because it includes the smaller $PM_{2.5}$ category as well as the larger particles. In response, in January 2006, the EPA proposed a 24-hour standard for $PM_{10\text{-}2.5}$. The standard would have been set at a level of 70 μg/m^3, compared with the current 24-hour PM_{10} standard of 150 μg/m^3. The final standards promulgated in October reversed course, leaving in place

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[6] U.S. EPA, National Ambient Air Quality Standards for Particulate Matter, Proposed Rule, Preamble, 71 *Federal Register* 2651, Jan. 17, 2006.

[7] See discussion beginning at 71 *Federal Register* 61172, Oct. 17, 2006.

[8] 71 *Federal Register* 2652, Jan. 17, 2006.

the current form of the standard (PM_{10}) and the current level (150 $\mu g/m^3$). The only change to the PM_{10} standard was the revocation of its *annual* component. The agency argues that it has provided more thorough reasoning in support of the use of PM_{10} as its coarse particle indicator, and believes that its explanation will satisfy the court.

CASAC's Views. The Administrator's decisions represent the first time in CASAC's nearly 30-year history that the promulgated standards fall outside of the range of the scientific panel's recommendations. In a letter dated September 29, 2006, the seven members of CASAC objected to the Administrator's actions, both as regards PM_{10} and $PM_{2.5}$. With regard to $PM_{2.5}$, the letter stated: "CASAC is concerned that EPA did not accept our finding that the annual $PM_{2.5}$ standard was not protective of human health and did not follow our recommendation for a change in that standard."[9] The letter noted that "*there is clear and convincing scientific evidence that significant adverse human-health effects occur in response to short-term and chronic particulate matter exposures at and below 15 $\mu g/m^3$*," and noted that 20 of the 22 Particulate Matter Review Panel members, including all 7 members of the statutory committee, were in "complete agreement" regarding the recommended reduction: "*It is the CASAC's consensus scientific opinion that the decision to retain without change the annual $PM_{2.5}$ standard does not provide an 'adequate margin of safety ... requisite to protect the public health' (as required by the Clean Air Act) ....*"[10]

With regard to PM_{10}, the letter stated that CASAC was "completely surprised" at the decision to revert to the use of PM_{10} as the indicator for coarse particles, noting that the option of retaining the existing daily PM_{10} standard was not discussed during the advisory process and that CASAC views this decision as "highly problematic."

The Administrator is not required by statute to follow CASAC's recommendations; the Act (Section 307(d)(3)) requires only that the Administrator set forth any pertinent findings, recommendations, and comments by CASAC (and the National Academy of Sciences) and, if his proposal differs in an important respect from any of their recommendations, provide an explanation of the reasons for such differences. Courts, in reviewing EPA regulations, generally defer to the Administrator's judgment on scientific matters, focusing more on issues of procedure, jurisdiction, and standing. Nevertheless, CASAC's detailed objections to the Administrator's decisions and its description of the process as having failed to meet statutory and procedural requirements could play a role if the standards are challenged in court.

Impacts of the New Standard. The EPA is prohibited from taking cost into account in setting NAAQS, but to comply with an executive order, the agency has produced a Regulatory Impact Analysis (RIA) analyzing in detail the costs and

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[9] Letter of Rogene Henderson et al. to Hon. Stephen L. Johnson, EPA Administrator, Sept. 29, 2006, available at [http://www.epa.gov/sab/pdf/casac-ltr-06-003.pdf].

[10] Ibid. Italics in original.

benefits of the new PM standards.[11] The agency estimates that compliance with the new $PM_{2.5}$ standard will prevent 1,200 to 13,000 premature deaths annually, as well as substantial numbers of hospital admissions and missed work or school days due to illness.[12] The agency actually produced three sets of benefit numbers, based on three different studies. The study on which the agency seems to have placed the greatest emphasis, conducted for the American Cancer Society, was used to estimate that 2,500 premature deaths would be avoided. The other two studies would have produced higher benefit numbers. The Harvard Six-City Study, for example, was used to estimate a reduction of 5,700 premature deaths annually, and an "Expert Elicitation"[13] produced a mean estimate of 7,000 premature deaths reduced. Critics of the rule argue that as many as 30,000 premature deaths could be avoided annually if the Administrator had chosen the more stringent standards endorsed by CASAC.[14] The higher estimate is based on the agency's Expert Elicitation.

The agency's RIA estimates the cost of meeting the new standards at $5.4 billion annually in 2020 and, as shown in **Table 2**, provides a range of benefit estimates (from $8 billion to $76 billion annually, depending on the number of avoided deaths, the choice of discount rate, and other factors). A more stringent alternative (reducing the annual standard to 14 $\mu g/m^3$) would increase the cost by about 50%, to $7.9 billion annually, according to the agency, but would nearly double the estimated benefits.[15] Thus, the benefit-cost ratio would be more favorable, according to the agency's analysis, had the Administrator chosen the more stringent standard.

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[11] [http://epa.gov/pm/actions.html].

[12] See "Regulatory Impact Analysis of EPA's Final Revisions to the National Ambient Air Quality Standards for Particle Pollution (Particulate Matter)," Fact Sheet, p. 2, at Ibid.

[13] In response to recommendations made in a 2002 National Academy of Sciences (NAS) report, "Estimating the Public Health Benefits of Proposed Air Pollution Regulations,"the EPA has been exploring ways to improve the characterization of uncertainty in its analyses of the health benefits of regulations affecting air quality. One suggested method for doing so was through the use of expert judgment. To solicit such judgment, the EPA used a wide range of nomination methods to assemble a group of 12 leading experts (8 epidemiologists, 3 toxicologists/health scientists, and 1 clinician) to respond to a question regarding the change in mortality associated with a defined change in $PM_{2.5}$ concentration. For additional information, see Industrial Economics, Incorporated (for U.S. EPA, Office of Air Quality Planning and Standards), *Expanded Expert Judgment Assessment of the Concentration-Response Relationship Between $PM_{2.5}$ Exposure and Mortality*, Sept. 21, 2006.

[14] "Stronger Soot Rule Could Avert 30,000 Premature Deaths — EPA Report," *E&E News PM*, Sept. 22, 2006.

[15] U.S. EPA, *Regulatory Impact Analysis of the 2006 National Ambient Air Quality Standards for Fine Particle Pollution (PM2.5)*, Table ES-1, available at [http://epa.gov/pm/actions.html].

Table 2. Estimated Costs and Benefits of the EPA's New $PM_{2.5}$ Standards

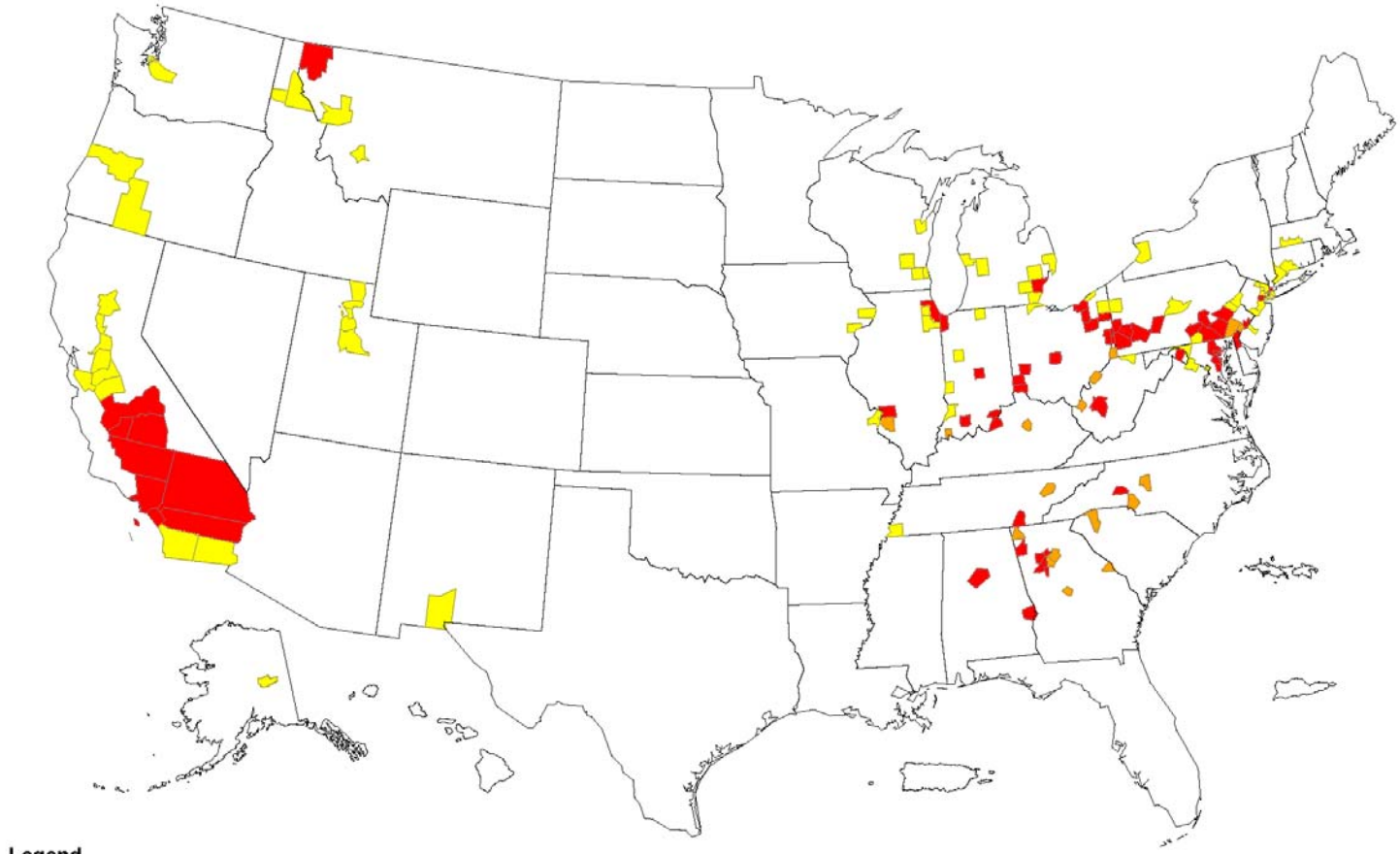
($ billion)

Basis of Benefit Estimate	Cost	Benefits
American Cancer Society Study	$5.4	$15 - $17
EPA Expert Elicitation	$5.4	$8 - $76

Source: EPA Regulatory Impact Analysis.

Using the most recent available monitoring data, the agency identified 143 counties where air quality is worse than allowed under the new standards. Observed on a map (**Figure 1**), these areas can seem small compared with the approximately 3,000 counties in the United States, but two factors make the impact of the standards far larger. First, the number of counties where emissions will need to be controlled may be two or three times the number of those exceeding the standard, because "nonattainment areas" include both counties where pollutant concentrations exceed the standard and those that *contribute* to exceedance of the standard in adjoining counties. Entire metropolitan areas tend to be designated nonattainment, even if only one county in the area has readings worse than the standard. Second, the nonattainment counties tend to have larger populations than those in attainment: 88 million people (about 30% of the U.S. population) live in the 208 counties designated nonattainment for the current standard. The new standard may affect an even larger percentage of the population.

Figure 1. Counties Exceeding Revised $PM_{2.5}$ Standards, Based on 2003-2005 Monitoring Data



Source: U.S. EPA.

Implementation of the NAAQS. A NAAQS does not directly limit emissions; rather, it represents the EPA Administrator's formal judgment regarding the level of ambient pollution that will protect public health with an adequate margin of safety. Promulgation of NAAQS sets in motion a process under which states and the EPA first identify nonattainment areas. After these areas are formally designated (a process the EPA estimates will take until April 2010 for the revised $PM_{2.5}$ standard), the states have three years to submit State Implementation Plans (SIPs) that identify specific regulations and emission control requirements that will bring the area into attainment. Attainment of the revised standard is to be achieved by 2015, according to the EPA, with a possible extension to 2020.

Issues. A number of issues were raised during consideration of the proposed standards, and most remain in the wake of the Administrator's decision. Those who would like to see stronger standards (including a number of states and environment and health groups) have focused on the agency's disregard of CASAC's recommendation that the annual $PM_{2.5}$ standard be strengthened. Some industrial and agricultural interests, on the other hand, are questioning the agency's strengthening of the standard for *all* fine particles, without distinguishing their source or chemical composition. The agency's response to this is that "... studies suggest that many different chemical components of fine particles and a variety of different types of source categories are all associated with, and probably contribute to, mortality, either independently or in combinations."[16] These and other issues may be raised in court challenges or in congressional oversight. The Clean Air Subcommittee of the Senate Environment and Public Works Committee held oversight hearings on the PM proposal on July 13 and July 19, 2006. Thirteen states, the District of Columbia, electric utilities and other industry groups, groups representing farmers and ranchers, and several environmental groups have challenged the standards in court.

(For a more detailed discussion of the new NAAQS, see CRS Report RL33254, *Air Quality: EPA's 2006 Changes to the Particulate Matter (PM) Standard*, by Robert Esworthy and James McCarthy.)

CASAC's Role in the NAAQS-Setting Process

The completion of the PM NAAQS review was followed in short order by an EPA announcement, on December 7, 2006, that it will modify the process for setting and reviewing NAAQS. Sections 108 and 109 of the Clean Air Act establish statutory requirements for the identification of NAAQS (or "criteria") air pollutants[17] and the setting and periodic review of the NAAQS standards. However, the process used by the agency is as much the result of 36 years of agency practice as it is of statutory requirements. In Section 109, for example, the statute establishes a Clean

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[16] EPA, Office of Research and Development, *Air Quality Criteria for Particulate Matter*, p. 9-31, as cited in Section II.C. of the Preamble to the Final Particulate Rule. See 71 *Federal Register* 61162 et seq., Oct. 17, 2006, for additional discussion.

[17] Criteria pollutants are pollutants that endanger public health or welfare, in the Administrator's judgment, and whose presence in ambient air results from numerous or diverse sources.

Air Scientific Advisory Committee to make recommendations to the Administrator regarding new NAAQS and, at five-year intervals, to make reviews of existing NAAQS with recommendations for revisions. In practice, EPA staff, not CASAC, have prepared these reviews, drafting "criteria documents," which review the science and health effects of criteria air pollutants, and "staff papers," which make policy recommendations. CASAC's role has been to review and approve these EPA documents before they went to the agency's political appointees and the Administrator for final decisions.

Under the new procedures, the EPA's political appointees will have a role early in the process, helping to choose the scientific studies to be reviewed, and CASAC will no longer have a role in approving the policy staff paper with its recommendations to the Administrator. CASAC will be relegated to commenting on the policy paper after it appears in the *Federal Register*, during a public comment period. The goal, according to agency officials, is to speed up the review process, which has consistently taken longer than the five years allowed by statute. "These improvements, will help the agency meet the goal of reviewing each NAAQS on a 5-year cycle as required by the Clean Air Act, without compromising the scientific integrity of the process,"[18] according to the memorandum that finalized the changes. The changes concern environmental groups and some in the scientific community, however, because they appear to give a larger role to the agency's political appointees and a smaller role to EPA staff and CASAC.

As noted earlier, the Administrator is not required by the Clean Air Act to follow CASAC's recommendations; the Act (Section 307(d)(3)) requires only that the Administrator set forth in the *Federal Register* (in the NAAQS proposal) any pertinent findings, recommendations, and comments by CASAC (and the National Academy of Sciences) and, if his proposal differs in an important respect from any of their recommendations, provide an explanation of the reasons for such differences. However, the new procedures change the role that CASAC has historically played.

CASAC itself appears less concerned with the changes than some who are advocating on its behalf. The committee does not plan to issue a formal response to the December 7 memo. In response to a draft of the changes, the committee made a number of suggestions, some of which, such as the convening of a science workshop at the outset of the process to better focus the review, were incorporated in the final memorandum. This appears to have addressed one of CASAC's major concerns, that the old process spent too much time compiling an encyclopedic review of the literature, much of which had little relevance to the policy questions that needed to be addressed. With respect to the EPA taking comments from CASAC at the same time that it considers comments from the public, CASAC's Chair is

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[18] "Process for Reviewing National Ambient Air Quality Standards," Memorandum of Marcus Peacock, Deputy EPA Administrator, to Dr. George Gray, Assistant Administrator, Office of Research and Development, and Bill Wehrum, Acting Assistant Administrator, Office of Air and Radiation, Dec. 7, 2006, p. 3, at [http://www.epa.gov/ttn/naaqs/memo_process_for_reviewing_naaqs.pdf].

reported to have said, "[S]ome of the members were concerned but most are not, because it doesn't change CASAC's ability to comment."[19]

Reaction elsewhere has been stronger. Responding to the announced changes, the incoming Chair of the Environment and Public Works Committee, Senator Barbara Boxer, called them "unacceptable," and said the committee plans to make them a top priority for oversight in the 110th Congress.[20] Seven Democratic members of the committee, including Senator Boxer, wrote EPA Administrator Johnson to express their strong opposition to the changes and to ask him to "abandon" them.[21]

Multi-pollutant Legislation for Power Plants

Besides air quality standards, the major focus of interest among members of Congress and other policy makers concerned with air quality has been the regulation of electric power plants. Coal-fired power plants are among the largest sources of air pollution in the United States; however, under the Clean Air Act, they are not necessarily subject to stringent requirements. Emissions and the required control equipment can vary depending on the location of the plant, when it was constructed, whether it has undergone major modifications, the specific type of fuel it burns, and, to some extent, the vagaries of EPA enforcement policies. More than half a dozen separate Clean Air Act programs could potentially be used to control emissions, which makes compliance strategy complicated for utilities and difficult for regulators. Because the cost of the most stringent available controls, for the entire industry, could range into the tens of billions of dollars, utilities have fought hard and rather successfully to limit or delay regulations affecting them, particularly with respect to plants constructed before the Clean Air Act of 1970 was passed.

As a result, emissions from power plants have not been reduced as much as those from some other sources. Many plants built in the 1950s and 1960s (generally referred to as "grandfathered" plants) have little emission control equipment. Collectively, these plants are large sources of pollution. In 2003, power plants accounted for 10.2 million tons of sulfur dioxide (SO_2) emissions (70% of the U.S. total), about 45 tons of mercury emissions (more than 40% of the U.S. total), and 3.6 million tons of nitrogen oxides (19% of the U.S. total). Power plants are also considered major sources of fine particles ($PM_{2.5}$), many of which form in the atmosphere from emissions from a wide range of stationary and mobile sources. In addition, power plants account for about 40% of U.S. anthropogenic emissions of the

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[19] Comment of Dr. Rogene Henderson, CASAC Chair, in "EPA Adviser Plays Down Democrats' Criticism over New NAAQS Changes," *Inside EPA Clean Air Report*, Dec. 14, 2006.

[20] Office of Senator Barbara Boxer, "Boxer Statement on EPA's Politicization of Clean Air Health Standards," Press Release, Dec. 8, 2006, at [http://boxer.senate.gov/news/releases/record.cfm?id=266781].

[21] Office of Senator Barbara Boxer, "Democratic Members of Senate EPW Committee Warn EPA on Air Rollbacks," Press Release, Dec. 21, 2006, at [http://boxer.senate.gov/news/releases/record.cfm?id=267092].

greenhouse gas carbon dioxide; these emissions are not subject to federal regulation but have been the focus of much debate in recent years.

With new ambient air quality standards for ozone and fine particles taking effect, emissions of NOx (which contributes to the formation of ozone) and SO_2 (which is among the sources of fine particles) would necessarily have to be reduced to meet standards. Mercury emissions have also been a focus of concern: 44 states have issued fish consumption advisories due to mercury pollution, covering 13 million acres of lakes, 765,000 river miles, and the coastal waters of 12 entire states. The continuing controversy over the interpretation of New Source Review requirements for existing power plants (discussed below) is also exerting pressure for a more predictable regulatory structure.

Thus, many in industry, environmental groups, Congress, and the Administration have said, for several years now, that the time is ripe for legislation that addresses power plant pollution in a comprehensive (multi-pollutant) fashion. Such legislation (the Administration version of which is entitled the Clear Skies Act[22]) would address the major pollutants on a coordinated schedule and would rely, to a large extent, on a system such as the one used in the acid rain program, where national or regional caps on emissions are implemented through a system of tradeable allowances. The key questions have been how stringent the caps should be and whether carbon dioxide (CO_2), the major gas of concern with regard to climate change, will be among the emissions subject to a cap.

It is unclear what direction, if any, the new Congress will take regarding multi-pollutant legislation, but bills introduced in previous Congresses have generally fallen into three groups: (1) the Administration's Clear Skies bill, which would regulate three pollutants (SO_2, NOx, and mercury), give electric generators until 2018 to meet the bill's final emission caps, allow trading of allowances for all three pollutants, and remove or restrict numerous existing Clean Air Act requirements; (2) Representative Waxman's, Senator Leahy's, and former Senator Jeffords's bills, which, although different from each other in many details, regulated *four* pollutants (CO_2 in addition to the other three), gave utilities less time (until 2009 or 2010) to make reductions, set more stringent emission caps, did not allow trading of mercury emission allowances, and generally left existing Clean Air Act requirements in place; and (3) Senator Carper's and former Representative Bass's bills, which essentially split the difference between the first two groups on the stringency and timing of SO_2, NOx, and mercury controls; established a CO_2 control program (but less stringent than the Waxman, Leahy, or Jeffords bills); and generally left existing Clean Air Act requirements in place. (For additional information and a detailed comparison of legislative proposals in the last Congress, see CRS Report RL32755, *Air Quality: Multi-Pollutant Legislation in the 109th Congress*, by Larry Parker and John Blodgett.)

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[22] The Administration first proposed the Clear Skies Act on Feb. 14, 2002, and the bill was introduced by request in the 107th Congress as H.R. 5266/S. 2815. In the 109th Congress, a somewhat modified Clear Skies bill was introduced as S. 131.

Because the deadlines are far in the future, the Administration's analysis of Clear Skies has shown that utilities would be likely to "overcomply" in the early years of the program. The Administration uses this as a selling point for its approach, arguing that it will achieve reductions sooner than would a traditional regulatory approach with the same deadlines. However, overcompliance in the early years would lead to "banked" emission allowances; these could be used in later years to delay achievement of required reductions. In its analysis of the bill, the EPA does not expect to see the full 70% emission reductions that it requires until 2026 or later, a point seized upon by its opponents to support a more aggressive approach.

As noted, the Clear Skies bill includes no cap on CO_2 emissions. The Administration has rejected mandatory controls on CO_2, in keeping with its opposition to the Kyoto Protocol to the United Nations Framework Convention on Climate Change. It opposes Kyoto for a variety of reasons, principally the potential economic impacts on U.S. industries.

The absence of CO_2 from the mix leads to different strategies for achieving compliance, preserving more of a market for coal, and lessening the degree to which power producers might switch to natural gas or renewable fuels as a compliance strategy. In its opposition to CO_2 controls, the Administration is supported by most in the utility and coal industries. Others, mostly outside these industries but including some utilities, view CO_2 controls as inevitable, and perhaps desirable, and support simultaneous implementation of cap-and-trade programs for CO_2 and the other pollutants.

The Senate Environment and Public Works Committee has voted twice on a multi-pollutant bill, but none of the bills has progressed to the House or Senate floor. On March 10, 2005, however, EPA announced that it would use existing Clean Air Act authority to promulgate final regulations similar to the Clear Skies bill for utility emissions of SO_2 and NOx in 28 eastern states and the District of Columbia.[23] The Clean Air Interstate Rule (CAIR) established cap-and-trade provisions that mimic those of Clear Skies, but the regulations cover only the eastern half of the country, and, as a regulation, CAIR has no authority to allow the EPA to remove existing Clean Air Act requirements, as Clear Skies would. Under CAIR, the EPA projects that nationwide emissions of SO_2 will decline 53% by 2015 and NOx emissions will decline 48%. The agency also projects that the rule will result in $85-$100 billion in health benefits annually by 2015, including the prevention of 17,000 premature deaths annually.[24] CAIR's health and environmental benefits are more than 25 times greater than its costs, according to the EPA. Similarly, any of the multi-pollutant bills are expected to have benefits far outweighing their costs. (For additional information on the CAIR rule, see CRS Report RL32927, *Clean Air Interstate Rule: Review and Analysis*, by Larry Parker. For a discussion of the costs and benefits of the principal multi-pollutant approaches, see CRS Report RL33165, *Costs and Benefits of Clear Skies: EPA's Analysis of Multi-Pollutant Clean Air Bills*, by James E. McCarthy and Larry B. Parker.)

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[23] The rule appeared in the *Federal Register* on May 12, 2005 (70 FR 25162).

[24] U.S. EPA, Office of Air and Radiation, "Clean Air Interstate Rule — Basic Information," available at [http://www.epa.gov/interstateairquality/basic.html].

Mercury From Power Plants

On March 15, 2005, the EPA also finalized through regulation a cap-and-trade program for mercury emissions from electric utilities.[25] The mercury regulations (which, like CAIR, are based on the Clear Skies approach) rely almost entirely on co-benefits of regulating SO_2 and NOx. The agency's analysis of the mercury rule finds that less than 1% of coal-fired power plant capacity would install pollution control equipment specifically designed to control mercury within 10 years as a result of the mercury rule. By 2020, only 4% of capacity would have such equipment.

The EPA was required by the terms of the 1990 Clean Air Act Amendments and a 1998 consent agreement to determine whether regulation of mercury from power plants under Section 112 of the Clean Air Act was appropriate and necessary. It concluded that it was, in a December 2000 regulatory finding. The finding triggered other provisions of the consent agreement: that the agency propose Maximum Achievable Control Technology (MACT) standards for electric power plants by December 15, 2003, and finalize them by March 15, 2005.

The December 2003 proposal offered two alternatives. The first met the agency's requirement under the consent agreement by proposing MACT standards. The standards would have applied on a facility-by-facility basis and would have resulted in emissions of 34 tons of mercury annually, a reduction of about 30% from the 1999 level. The standards would have taken effect in 2008, three years after promulgation, with possible one-year extensions.

The second alternative uses Section 111(d) of the act. To avoid having to promulgate MACT standards, which would set limits for each individual facility, the agency proposed reversing its December 2000 regulatory finding, arguing that although MACT standards were "appropriate," they were not "necessary" because the emissions could be controlled under Section 111(d) instead, a section that allows a more flexible approach, such as a cap-and-trade program. Section 111(d) has rarely been used before — and never for hazardous air pollutants.

The final regulations, promulgated March 15, 2005, chose the second approach, establishing a national cap-and-trade system for power plant emissions of mercury. The cap will be 15 tons of emissions nationwide in 2018 (about a 70% reduction from 1999 levels, when achieved). There will also be an intermediate cap of 38 tons in 2010. The caps will be implemented through an allowance system similar to that used in the acid rain and CAIR programs, through which utilities can either control the pollutant directly or purchase excess allowances from other plants that have instituted controls more stringently or sooner than required. As with the acid rain and CAIR programs, early reductions can be banked for later use, which the agency says

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[25] The mercury rule appeared in the *Federal Register* in two parts: in the first part, on March 29, 2005 (as explained further in the text below), the agency revised its determination that mercury emissions from electric generating units should be regulated as hazardous air pollutants under Section 112 of the Clean Air Act (70 FR 15994); in the second part, on May 18, 2005, the agency promulgated a cap-and-trade program under Section 111 of the act (70 FR 28606).

will result in utilities delaying compliance with the full 70% reduction until well beyond 2018, as they use up banked allowances rather than installing further controls. The agency's analysis projects actual emissions to be 24.3 tons (less than a 50% reduction) as late as 2020. Full compliance with the 70% reduction would be delayed until after 2025.[26] (For additional information on the mercury rule, see CRS Report RL32868, *Mercury Emissions from Electric Power Plants: An Analysis of EPA's Cap-and-Trade Regulations*, by James E. McCarthy.)

Besides the stretched out implementation schedule, one of the main criticisms of the cap-and-trade proposal is that it would not address "hot spots," areas where mercury emissions and/or concentrations in water bodies are greater than elsewhere. It would allow a facility to purchase allowances and avoid any emission controls, if that compliance approach makes the most sense to the plant's owners and operators. If plants near hot spots do so, the cap-and-trade system may not reduce mercury concentrations in the most contaminated areas. By contrast, a MACT standard would have required reductions at all plants, and would therefore be expected to improve conditions at hot spots.

Many argue that the mercury regulations should be more stringent or implemented more quickly. To a large extent, these arguments, and EPA's counter-arguments, rest on assumptions concerning the availability of control technologies. Controlling SO_2, NOx, and mercury simultaneously, as the agency prefers, would allow utilities to maximize "co-benefits" of emission controls. Controls such as scrubbers and fabric filters, both of which are widely used today to control SO_2 and particulates, have the side effect of reducing mercury emissions to some extent. Under EPA's cap-and-trade regulations, both the 2010 and 2018 mercury emission standards are set to maximize use of these co-benefits. Thus, few controls would be required to specifically address mercury emissions before the 2020s, the costs specific to controlling mercury would be minimal, and emissions would decline to about 50% of the 1999 level in 2020.

Besides citing the cost advantage of relying on co-benefits, the EPA has claimed that technology specifically designed to control mercury emissions (such as activated carbon injection, ACI) would not be generally available until after 2010. This assertion is widely disputed. ACI and fabric filters have been in use on municipal waste and medical waste incinerators for a decade, and have been successfully demonstrated in at least 16 full-scale tests at coal-fired power plants, for periods as long as a year. Manufacturers of pollution controls and many others maintain that if the agency required the use of ACI and fabric filters at power plants, reductions in mercury emissions as great as 90% could be achieved at reasonable cost in the near future. Relying on these assertions, about 20 states have promulgated requirements stricter than the federal program, with several requiring 80% to 90% mercury reductions before 2010. (For additional information, see CRS Report RL33535,

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[26] U.S. EPA, Office of Air Quality Planning and Standards, *Regulatory Impact Analysis of the Clean Air Mercury Rule*, March 2005, Table 7-3, p. 7-5, at [http://www.epa.gov/ttn/atw/utility/ria_final.pdf]. For further discussion, see CRS Report RL32868, *Mercury Emissions from Electric Power Plants: An Analysis of EPA's Cap-and-Trade Regulations*, by James E. McCarthy.

Mercury Emissions from Electric Power Plants: States Are Setting Stricter Limits, by James E. McCarthy.)

It is unclear whether the EPA has legislative authority to establish a cap-and-trade program for mercury: many argue that the agency is required by the statute to impose MACT standards on each individual plant once it has decided to control mercury emissions. Questions also have arisen regarding the role of industry lobbyists in crafting portions of the EPA proposal. For many of these reasons, 45 Senators wrote EPA Administrator Leavitt at the beginning of April 2004 to request that he withdraw the mercury proposal and start over. In June, 2004, 178 House members wrote Leavitt that they hoped further review "will lead to a stronger final rule." On February 3, 2005, the EPA Inspector General echoed these comments, concluding that EPA senior management instructed the staff to develop a standard that would result in emissions of 34 tons annually, instead of basing the standard on unbiased analysis. Nevertheless, the agency acted to make the final rule less stringent rather than strengthening it.[27] The agency's cost-benefit analysis also did not include several peer-reviewed studies that indicated stricter utility mercury rules would have yielded large benefits. Thus, opponents, including at least 15 states, have filed suit to overturn the rule.[28]

In September 2005, the Senate considered, but narrowly defeated, a challenge to the rule under the Congressional Review Act.[29]

New Source Review

A related issue that has driven some of the debate over the regulation of power plant emissions is whether the EPA has adequately enforced existing regulations, using a process called New Source Review (NSR). The New Source Review debate has occurred largely in the courts. The EPA took a more aggressive stance on NSR under the Clinton Administration, filing lawsuits against 13 utilities for violations at 51 plants in 13 states. The Bush Administration has taken action against an additional half a dozen utilities but has made little headway in settling the original suits or in bringing them to trial. In the meantime, it has proposed major changes in the NSR regulations that critics argue will weaken or eliminate New Source Review as it pertains to modifications of existing plants.

The controversy over the NSR process stems from the EPA's application of New Source Performance Standards to existing stationary sources of air pollution that have been modified. The Clean Air Act requires that plants undergoing

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[27] Office of the Inspector General, U.S. EPA, *Additional Analyses of Mercury Emissions Needed Before EPA Finalizes Rules for Coal-Fired Electric Utilities*, Feb. 3, 2005, p. 10, available at [http://www.epa.gov/oig/reports/2005/20050203-2005-P-00003.pdf].

[28] New Jersey v. EPA, No. 05-1097 (D.C. Cir.) Filed Mar. 29, 2005.

[29] For discussion of the Congressional Review Act and how it applied to the mercury rule, see CRS Report RS22207, *Congressional Review of EPA's Mercury Rule*, by James McCarthy and Richard Beth.

modifications meet NSR requirements by installing best available pollution controls, but industry has often avoided the NSR process by claiming that changes to existing sources were "routine maintenance" rather than modifications. In the 1990s, the EPA began reviewing records of electric utilities, petroleum refineries, and other industries to determine whether the changes were, in fact, routine. As a result of these reviews, since late 1999, the EPA and the Department of Justice have filed suit or administrative actions against numerous large sources of pollution, alleging that they made major modifications to their plants, extending plant life and increasing output, without undergoing required New Source Reviews and without installing best available pollution controls.

Of the utilities charged with NSR violations, 11 have settled with the EPA, generally without going to trial. Under the settlements, they have agreed to spend about $5 billion over the next decade on pollution controls or fuel switching to reduce emissions at their affected units. Combined, these companies will reduce pollution by about 775,000 tons annually. Since July 25, 2000, the agency has also reached 17 agreements with petroleum refiners representing three-fourths of industry capacity. The refiners agreed to settle potential charges of NSR violations by paying fines and installing equipment to eliminate 315,000 tons of pollution.

About half the utilities charged with NSR violations have not settled with the EPA. They and other critics of the agency's enforcement actions claim that the EPA reinvented the rules. They also contend that a strict interpretation of what constitutes routine maintenance will prevent them from making changes that would have previously been allowed without a commitment of time and money for permit reviews and the installation of expensive pollution control equipment. This provides disincentives for power producers, refiners, and others to expand output at existing facilities, they maintain.

The first case involving one of the nonsettling utilities went to trial in February 2003. In an August 7, 2003, decision, the U.S. District Court for the Southern District of Ohio found that Ohio Edison had violated the Clean Air Act 11 times in modifying its W. H. Sammis power plant. The company subsequently settled the case, agreeing to spend $1.1 billion to install controls that are expected to reduce pollution by 212,000 tons annually.[30] In a second case, decided in April 2004 and currently on appeal to the U.S. Supreme Court, Duke Energy was found not to have violated the act despite undertaking modifications that increased total emissions without undergoing New Source Review. The U.S. District Court for the Middle District of North Carolina, in a decision upheld by the Fourth Circuit Court of Appeals, held that since the maximum *hourly* emissions rate did not increase as a result of the modifications, even if annual emissions did increase, the company was not required to undergo NSR and install more stringent pollution controls.[31]

While pursuing these enforcement actions, the Bush Administration has promulgated a number of changes to the NSR regulations that would make future

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[30] United States v. Ohio Edison Co., No. C-2-99-1181, [S.D. Ohio].

[31] United States v. Duke Energy Corp., 278 F.Supp. 2d 619 [M.D.N.C. 2003] affirmed, 411 F. 3d 539 [4th Cir., 2005], petition for cert. Filed [No. 05-848].

enforcement of NSR less likely. In December 2002 and October 2003, the agency promulgated five sets of changes to the NSR rules. The most controversial were new regulations defining what constitutes routine maintenance.[32] The new regulations would have exempted industrial facilities from undergoing NSR (and thus from installing new emission controls) if they were replacing safety, reliability, and efficiency-rated components with new, functionally equivalent equipment, and if the cost of the replacement components was less than 20% of the replacement value of the process unit. Using this benchmark, few, if any, plant modifications would trigger new pollution controls.

These changes were highly controversial. The Administration and its supporters characterized them as streamlining or improving the program; others saw them as permanently "grandfathering" older, more polluting facilities from ever having to meet the clean air standards required of newer plants. Fifteen states, three municipalities, and several environmental groups filed suit to block the "equipment replacement / routine maintenance" rule. The rule was stayed by the U.S. Court of Appeals for the D.C. Circuit on December 24, 2003. On March 17, 2006, a three-judge panel of the court unanimously struck the rule down. In its decision, the court held that the EPA's attempt to change the NSR regulations was "contrary to the plain language" of the Clean Air Act.[33]

The EPA proposed further changes to the NSR regulations on October 20, 2005, and September 8, 2006[34]; these regulations have yet to be promulgated. Under the October 2005 proposal, power plants could modify existing facilities without triggering NSR, provided that the facility's "maximum hourly emissions achievable" after the changes were no greater than the same measure at any point during the past five years. By focusing on the hourly rate, rather than the previous measure (annual emissions), the new rule would effectively allow increases in annual emissions any time a modification led to an increase in the hours of operation of a facility. The agency's proposal stated that this change would establish a uniform national emissions test, in conformance with the Fourth Circuit's decision in the Duke Energy case, and it downplayed the significance of the change in light of "substantial emissions reductions from other CAA [Clean Air Act] requirements that are more efficient." But internal EPA documents released by an environmental group indicate that the proposed rule was strongly opposed by the Air Enforcement Division, whose Director concluded that it would adversely affect the agency's NSR enforcement cases and is largely unenforceable as written.[35]

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[32] These changes appeared in the *Federal Register* on Oct. 27, 2003 (68 FR 61247).

[33] State of New York v. EPA, No. 03-1380, 2006 Westlaw 662746 [D.C. Cir., Mar. 17, 2006].

[34] 70 FR 61081, Oct. 20, 2005. The September 2006 proposal had not yet appeared in the *Federal Register* as of this writing, but it is available on the EPA's website at [http://www.epa.gov/nsr/documents/dapn_analysis_9-8-06.pdf]. It would limit application of NSR by allowing plants to consider emissions only from the unit undergoing modification, rather than the entire plant, in determining whether NSR applies.

[35] Memorandum of Adam M. Kushner, Director, Air Enforcement Division, U.S. EPA, to (continued...)

Thus, there appears to be a conflict between the EPA's regulatory actions and its enforcement stance. While the agency stated in promulgating the equipment replacement rule that "we do not intend our actions today to create retroactive applicability for today's rule," continued pursuit of the enforcement actions filed during the Clinton Administration would create a double standard for utilities, with one set of rules applicable to those utilities unlucky enough to have been cited for violations prior to promulgation of the new rule, and a different standard applicable afterward. Despite earlier agency denials that the rule would affect ongoing investigations, in early November 2003, the EPA's enforcement chief, J. P. Suarez, and another EPA official were reported to have indicated that the agency would drop enforcement actions against 47 facilities that had already received notices of violation, and would drop investigations of possible violations at an additional 70 power companies. Agency staff who were involved in the enforcement actions note that the prospect of an NSR rollback caused utilities already charged with violations to withdraw from settlement negotiations over the pending lawsuits, delaying emission reductions that could have been achieved in the near future.[36] (For additional information, see CRS Report RS21608, *Clean Air and New Source Review: Defining Routine Maintenance*, and CRS Report RL31757, *Clean Air: New Source Review Policies and Proposals*, both by Larry Parker.)

At Congress's direction, the National Academy of Sciences began a review of the NSR program in May 2004. An interim report, released in January 2005, said the committee had not reached final conclusions, but it also said, "In general, NSR provides more stringent emission limits for new and modified major sources than EPA provides in other existing programs" and "It is ... unlikely that Clear Skies would result in emission limits at individual sources that are tighter than those achieved when NSR is triggered at the same sources."[37] The final report, issued July 21, 2006, found that

> [m]ore than 60% of all coal-fired electricity-generation capacity in the United States currently lacks the kinds of controls for SO_2 and NO_x emissions that have been required under NSR. Also, the older facilities are more likely than newer facilities to undergo maintenance, repair, and replacement of key components, so a substantial portion of emissions from the electricity-generating sector is potentially affected by the NSR rule changes.[38]

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[35] (...continued)
William Harnett, Director, Information Transfer and Program Integration Division, Office of Air Quality Planning and Standards, Aug. 25, 2005, p. 1.

[36] See, for example, "Departing EPA Official Issues Broadside at Administration Air, Enforcement Programs," *Daily Environment Report*, Mar. 1, 2002, p. AA-1. Also, "Second Former EPA Enforcement Official Raps Bush's New Source Review Reforms," *Daily Environment Report*, Oct. 22, 2002, p. A-9.

[37] National Research Council of the National Academies, *Interim Report of the Committee on Changes in New Source Review Programs for Stationary Sources of Air Pollutants* (Washington, DC: The National Academies Press, 2005), p. 27.

[38] National Research Council of the National Academies, *New Source Review for Stationary Sources of Air Pollutants* (Washington, DC: The National Academies Press, 2006), (continued...)

Nevertheless, the report reached ambivalent conclusions. On the one hand, the report stated, "It is reasonable to conclude that the implementation of the ERP [the proposed Equipment Replacement Provision] could lead to SO_2 and NO_x emission increases in some locations and decreases in others."[39] On the other hand,

> the committee concluded overall that, because of a lack of data and the limitations of current models, it is not possible at this time to quantify with a reasonable degree of certainty the potential effects of the NSR rule changes on emissions, human health, energy efficiency, or on other relevant activities at facilities subject to the revised NSR program.[40]

Besides the NAS study, on April 21, 2003, the National Academy of Public Administration released a report commissioned by Congress that made sweeping recommendations to modify NSR. The study panel recommended that Congress end the "grandfathering" of major air emission sources by requiring all major sources that have not obtained an NSR permit since 1977 to install Best Available Control Technology or Lowest Achievable Emissions Rate control equipment. In the interim, the NAPA panel concluded, the EPA and the Department of Justice should continue to enforce NSR vigorously, especially for changes at existing facilities.[41]

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[38] (...continued)
Prepublication Copy, p. 3.

[39] Ibid., p. 5.

[40] Ibid., p. 2.

[41] National Academy of Public Administration, *A Breath of Fresh Air: Reviving the New Source Review Program*, Summary Report, April 2003, p. 3.