

# CRS Report for Congress

## **Clean Air Issues in the 110<sup>th</sup> Congress: Climate Change, Air Quality Standards, and Oversight**

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**Prepared for Members and  
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## Summary

Attention to environmental issues in the 110<sup>th</sup> Congress has focused early and heavily on climate change – the state of the science, and whether (and, if so, how) to address greenhouse gas emissions. Six bills had been introduced to establish caps on greenhouse gas emissions as of the end of March, and hearings on climate change have been held by at least seven committees. The Speaker of the House set a June deadline for House committee action on legislation, and established a Select Committee on Energy Independence and Global Warming to highlight the issue.

Four of the six greenhouse gas bills introduced as of this writing would amend the Clean Air Act, establishing a new Title VII to address the issue. More such legislation, as well as free-standing legislation, is likely to be introduced as the session continues. Whether or not climate change legislation would amend the Clean Air Act, climate change hearings and markup are among the highest expressed priorities in the coming months for the committees that have jurisdiction over air issues (principally the Senate Environment and Public Works and House Energy and Commerce Committees).

Other clean air issues are less likely to be the main focus of attention, but they may be addressed, especially through oversight of Administration actions. In general, EPA regulatory and procedural actions are likely to be more subject to scrutiny in this Congress, given its intention to reinvigorate the oversight function. Potential oversight issues include:

- whether 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 EPA should continue to regulate lead as one of six pollutants for which it sets national ambient air quality standards;
- 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.

State governments and the courts have also taken action on air issues that may stir congressional interest. On April 2, the Supreme Court decided two cases that have broad implications for EPA and state authority to control greenhouse gases and to regulate power plants. In the more sweeping of the two cases, *Massachusetts v. EPA*, the Court found that EPA has authority under the Clean Air Act to regulate greenhouse gas emissions from new motor vehicles. Other cases involving climate change, clean air standards, and the regulation of power plants are pending at the D.C. Circuit Court of Appeals and in a number of federal and state courts. Decisions in these cases may prompt hearings or legislation. In addition, states interested in setting more stringent environmental standards are continuing to develop and implement regulations that go well beyond the requirements of federal law.

## Contents

Introduction .....	1
Climate Change .....	1
Should Greenhouse Gases Be Regulated as Air Pollutants? .....	3
Should Legislation Focus on Individual Sectors, the Economy as a Whole, or Both? .....	4
Is Cap-and-Trade the Best Approach? .....	5
What Role for Carbon Taxes? .....	6
The Role of State Programs .....	7
Other Clean Air Issues .....	7
Revision of the Particulate Standards .....	8
CASAC's Views .....	9
Impacts of the New Standard .....	10
Implementation of the NAAQS .....	12
Issues .....	12
CASAC's Role in the NAAQS-Setting Process .....	14
Revision of the NAAQS for Lead .....	16
Multi-pollutant Legislation for Power Plants .....	17
Mercury from Power Plants .....	19
New Source Review .....	22

## List of Figures

Figure 1. Counties Exceeding Revised PM <sub>2.5</sub> Standards, Based on 2003-2005 Monitoring Data .....	13
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## List of Tables

Table 1. Pre-existing, Recommended, and New NAAQS for PM <sub>2.5</sub> .....	9
Table 2. Estimated Costs and Benefits of the EPA's New PM <sub>2.5</sub> Standards .....	12

# Clean Air Issues in the 110<sup>th</sup> Congress: Climate Change, Air Quality Standards, and Oversight

## Introduction

Attention to environmental issues in the 110<sup>th</sup> Congress focused early and heavily on climate change. The shift of control from Republicans to Democrats in the new Congress has altered the political dynamic concerning this issue. Hearings have been held by at least seven committees as of this writing, and six bills to cap emissions of greenhouse gases (GHGs) had been introduced, with more expected. Congress has expressed an interest both in the state of the science and in specific questions such as whether and, if so, how to reduce greenhouse gas emissions.<sup>1</sup> The Speaker of the House has set a June deadline for House committee action on legislation, and established a Select Committee on Energy Independence and Global Warming to highlight the issue.

Four of the six GHG bills introduced as of this writing would amend the Clean Air Act, establishing a new Title VII to address the issue. (For additional information on climate change legislation, see CRS Report RL33846, *Climate Change: Greenhouse Gas Reduction Bills in the 110<sup>th</sup> Congress*, by Larry Parker.) Whether or not climate change legislation would amend the Clean Air Act, climate change hearings and markup are among the highest expressed priorities in the coming months for the committees that have jurisdiction over air issues (principally the Senate Environment and Public Works and House Energy and Commerce Committees). Other clean air issues are less likely to be the main focus of attention, but they may be addressed, especially through oversight of Administration actions.

This report provides a brief overview of the climate change issue as well as other Clean Air Act issues the 110<sup>th</sup> Congress may consider.

## Climate Change

Climate change (often referred to as global warming) has been of interest to the Congress on some level for more than 30 years. Hearings on the topic occurred as early as 1975, with as many as 200 additional hearings since that time. In 1992, the United States ratified the U.N. Framework Convention on Climate Change (UNFCCC), which established a goal of reducing developed countries' greenhouse

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<sup>1</sup> CRS has more than a dozen active reports on climate change issues. The reader is referred to the CRS home page for additional information.

gas emissions to 1990 levels by the year 2000. In 1997, the parties to the UNFCCC, as a first step to advance stronger measures, negotiated binding emission reductions for developed countries in the Kyoto Protocol. The United States subsequently rejected the Protocol, focusing instead on research and on voluntary emission reduction programs.<sup>2</sup> Despite these programs, U.S. emissions of greenhouse gases have continued to climb: in 2005, U.S. emissions were 16% higher than in 1990.<sup>3</sup>

In recent years, Congress has expressed renewed interest in climate issues for several reasons. Perhaps the most important factor has been the continued strengthening of the science supporting the connection between emissions of greenhouse gases and climate changes, including mounting evidence that glaciers and polar ice caps are shrinking, global average temperatures are rising, and other climate-related phenomena are occurring. (For a summary of the science, see CRS Report RL33849, *Climate Change: Science and Policy Implications*, by Jane A. Leggett.) In response, about a dozen states have passed legislation to address the issue, including California and at least eight Northeastern states. (For a summary of state actions, see CRS Report RL33812, *Climate Change: Action by States to Address Greenhouse Gas Emissions*, by Jonathan L. Ramseur.) There has also been a shift in attitude on the part of some in industry, prompted in part by the growing patchwork of state-level and foreign requirements. New business coalitions have formed to urge Congress to address the problem, or to influence any legislation that Congress might consider.<sup>4</sup>

Congress was already beginning to respond to these changes before the 2006 elections. In the 109<sup>th</sup> Congress, the Senate passed a Sense of the Senate resolution that acknowledged a “growing scientific consensus” that human activity is a substantial cause of greenhouse gas accumulation in the atmosphere, causing average

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<sup>2</sup> The Bush Administration has focused voluntary efforts on reducing the “greenhouse gas intensity” of the economy, i.e., the amount of greenhouse gases emitted per unit of economic activity. GHG intensity has consistently declined since the 1970s; but the rate of economic growth has outpaced the intensity reductions, leading to a steady increase in emissions.

<sup>3</sup> World emissions also grew in the period, although comprehensive data for world greenhouse gas emissions are not available for the same time period. According to the World Resources Institute, world emissions of CO<sub>2</sub> (not including other greenhouse gases) grew 21% from 1990 to 2003.

<sup>4</sup> For example, see “Businesses Call on Congress to Act in 2007,” *Daily Environment Report*, January 23, 2007, p. A-1. The article reported that a coalition of 10 large U.S. energy and manufacturing firms joined environmental organizations in calling on Congress to approve legislation in 2007 that would create an economywide cap-and-trade system to cut the nation's greenhouse gas emissions, saying they would support legislation that would cap U.S. emissions at 2007 levels by 2012 and gradually reduce them by 60 percent to 80 percent by 2050. The companies included Alcoa, BP America, Caterpillar Inc., Duke Energy, DuPont, General Electric, Florida Power & Light, the Lehman Brothers global investment bank, PG&E, and PNM Resources. See also, “Exxon Mobil Greens Up Its Act,” *Fortune*, January 26, 2007, which notes: “In its ubiquitous corporate advertising, the company is talking about what actions should be taken to reduce greenhouse gas emissions, instead of questioning the science of climate change. ... That's a turnabout from the late 1990s and early 2000s when Exxon led the opposition to the Kyoto Protocols and provided funding for think tanks that challenged mainstream science.”

temperatures to rise, and called for a mandatory, market-based program to limit greenhouse gas emissions.<sup>5</sup> On a complicated issue such as greenhouse gas limits, the devil is in the details: agreement on general principles does not necessarily presage agreement on detailed legislative proposals. One detailed proposal has reached the Senate floor: the McCain-Lieberman bill (S. 1151 in the 109<sup>th</sup> Congress, S. 139 in the 108<sup>th</sup>) would have established a mandatory, market-based greenhouse gas reduction program. It was debated in the 109<sup>th</sup> Congress as an amendment to the Energy Policy Act of 2005 (S.Amdt. 826) and defeated by a 38-60 vote; as stand-alone legislation, it was defeated 43-55 in the 108<sup>th</sup> Congress.<sup>6</sup>

In the 110<sup>th</sup> Congress, there appears to be new impetus. In the Senate, the Chairs of both the Environment and Public Works Committee and the Energy and Natural Resources Committee have announced their intentions to move legislation; in the House, the Speaker has set a June deadline for committee action. But a significant number of questions, both procedural and substantive, may need to be addressed as legislation is considered.

**Should Greenhouse Gases Be Regulated as Air Pollutants?** The relationship of climate change legislation to the more traditional air pollution programs of the Environmental Protection Agency (EPA) is one such question. In brief, should greenhouse gases (particularly carbon dioxide) be considered air pollutants subject to regulation under the Clean Air Act, or are they more properly considered a side-effect of the use of fossil fuels to produce energy?

The answer to this question could affect jurisdiction over climate change legislation (particularly in the Senate, where both the Energy and Natural Resources Committee and the Environment and Public Works Committee have considered greenhouse gas legislation). It could determine whether EPA, the Department of Energy, or some other agency would administer an enacted climate change program. And it might affect whether states have authority independent of the federal government to control certain greenhouse gas emissions.

Over the years, EPA has taken both sides of this issue. Under the Clinton Administration, the agency's General Counsel argued that CO<sub>2</sub> is an air pollutant, and thus could be regulated under the existing authority of the Clean Air Act. The agency did not actually propose such regulation; it simply maintained that it would have the authority to do so if it chose. Under the Bush Administration, a new General Counsel argued the opposite, maintaining that Congress had clearly distinguished CO<sub>2</sub> from other air pollutants and, while authorizing research and data collection under the existing Clean Air Act, had expressly decided not to regulate the pollutant. (For a further discussion of these issues, see CRS Report RL32764, *Global Warming: The Litigation Heats Up*, by Robert Meltz.) The Bush Administration has also intervened in court to argue that controlling CO<sub>2</sub> and other greenhouse gas emissions from automobiles is equivalent to setting fuel economy standards (a regulatory

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<sup>5</sup> The resolution, which was Section 1612 of the Senate bill (H.R. 6, as amended by S.Amdt. 866), was not included in the enacted version of the bill, P.L. 109-58.

<sup>6</sup> The bill that was defeated was S. 139, as amended by S.Amdt. 2028.

authority that Congress reserved for the federal government), not controlling air pollution (where states have a regulatory role).<sup>7</sup>

In its April 2, 2007 decision in *Massachusetts v. EPA*,<sup>8</sup> the Supreme Court resolved the legal aspects of this issue, finding:

The Clean Air Act’s sweeping definition of “air pollutant” includes “any air pollution agent or combination of such agents, including *any* physical, chemical ... substance or matter which is emitted into or otherwise enters the ambient air ....” ... Carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons are without a doubt “physical [and] chemical ... substances[s] which [are] emitted into ... the ambient air.” The statute is unambiguous.<sup>9</sup>

Thus, the Court found no doubt that the Clean Air Act gives EPA the authority to regulate greenhouse gases (in this case, from new motor vehicles), although the specifics of such regulation might be subject to agency discretion.

As noted, four of the six bills introduced as of the end of March that would cap greenhouse gas emissions would amend the Clean Air Act. In order to sidestep the complexities of treating GHGs as traditional pollutants, they establish a new Title VII to establish a separate program for greenhouse gas emissions. In this respect, the bills emulate the 1990 Clean Air Act Amendments, which established separate titles to deal with acid precipitation (Title IV) and stratospheric ozone depletion (Title VI).

**Should Legislation Focus on Individual Sectors, the Economy as a Whole, or Both?** Most of the bills dubbed “climate change” bills would establish economy-wide programs to reduce greenhouse gas emissions. But recent Congresses have also seen dozens of bills aimed at the emissions of individual sectors, notably electric utilities, cars and trucks, electrical appliances, and commercial or government buildings. Together, these sectors account for the lion’s share of energy use and GHG emissions. Electric utilities account for about 40% of U.S. emissions of CO<sub>2</sub>. Transportation (of which the dominant portion is cars and trucks) accounts for about one-third. Appliances, other electrical equipment, and buildings all play important roles as consumers of energy; thus, reducing their energy use through efficiency standards, better insulation, etc., would be important means of reducing GHG emissions.

If the focus is on individual sectors rather than the economy as a whole, the likelihood is that new legislation to reduce GHGs would not amend the Clean Air Act, and the resulting regulatory programs would be implemented and administered by agencies other than EPA. For example, the Corporate Average Fuel Economy (CAFE) standards, which have regulated the fuel economy of automobiles and light trucks since the mid-1970s, are set and administered by the National Highway Traffic Safety Administration of the Department of Transportation. Appliance efficiency

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<sup>7</sup> For a further discussion of these issues, see CRS Report RL32764, *Global Warming: The Litigation Heats Up*, by Robert Meltz, pp. 10-12.

<sup>8</sup> [<http://www.supremecourtus.gov/opinions/06pdf/05-1120.pdf>]

<sup>9</sup> *Ibid.*, Opinion of the Court, p. 26.

standards are set by the Department of Energy. Other potential elements of a GHG reduction program, such as building codes, are administered by state and local governments, with little input from any department or agency of the federal government. Power plants represent a particularly complicated sector, which, depending on the source of power, may be regulated by the Nuclear Regulatory Commission, the Federal Energy Regulatory Commission, or EPA, with a major role also for state governments. (For a discussion of federal programs and policies, see CRS Report RL31931, *Climate Change: Federal Laws and Policies Related to Greenhouse Gas Reductions*, by Brent D. Yacobucci and Larry Parker.)

**Is Cap-and-Trade the Best Approach?** The complexity and sheer number of measures that might need to be taken in order to have a significant impact on GHG emissions in sector-specific approaches leads many to suggest an economy-wide approach, in which a decreasing annual emissions cap is established, and emission allowances are distributed or sold to major emitters. As the cap (and hence, the number of allowances) is gradually ratcheted down, markets would determine who reduces emissions: companies that could do so at low cost would have incentives to take action; companies with fewer or more costly options could buy allowances to cover excess emissions. (For a more complete discussion of these issues see CRS Report RL33799, *Climate Change: Design Approaches for a Greenhouse Gas Reduction Program*, by Larry Parker.)

Such cap-and-trade programs have an enviable reputation, largely based on the success of the Clean Air Act's acid rain program. That program imposed a cap on sulfur dioxide emissions for a limited number of electric power plants in 1995, and in 2000 lowered the cap and expanded coverage to more plants. It met its emission reduction goals at low cost, with virtually 100% compliance, and with minimal administrative oversight. The success of the program was at least partly the result of the favorable circumstances in which it was implemented: the reduction targets were easily met because of an abundant supply of cheap low-sulfur coal; there were only about 1,000 entities (power plants) covered by the trading program, making it simple and inexpensive to monitor and administer; and most of the regulated entities were allowed 10 years to achieve compliance, by which time, early reductions had generated an enormous number of extra allowances that helped lubricate the trading system.

Some other trading programs have not been as successful. Southern California's Regional Clean Air Incentives Market (RECLAIM), for example, which was implemented in 1994 to reduce emissions of nitrogen oxides (NO<sub>x</sub>) and sulfur dioxide (SO<sub>2</sub>) in the Los Angeles area, saw a 50-fold increase in NO<sub>x</sub> allowance prices during the 2000-2001 California energy crisis. To permit its continued functioning and allow utilities to use backup power generators, electric utilities were removed from the RECLAIM system, charged a flat fee of \$15,000 per ton for excess emissions, and subjected to new command and control requirements (i.e., the type of regulation the trading system was designed to avoid). The European GHG trading system, established to help European Union countries meet their Kyoto Protocol

targets, has also seen wild swings in short-term allowance prices during its start-up years, making planning and decision-making difficult for participating entities.<sup>10</sup>

A U.S. cap-and-trade system for GHG emissions would face a number of challenges. First, with the exception of electric utilities, sources of GHGs are not generally required to monitor or report their GHG emissions; what we know about sources is based, for the most part, on estimates. Thus, a monitoring requirement would need to be established to serve as a basis for any future reduction scheme, whether cap-and-trade or not. Second, decisions would need to be made regarding the comprehensiveness of any program: what economic sectors to include, what to establish as a small emitter exemption, etc. Again, this problem is not unique to cap-and-trade, but it assumes increasing importance if one is designing any economy-wide approach. Third, there are a wide array of issues related to the distribution or sale of allowances, including what year to choose as the base year against which to measure emission reductions; what criteria or method to use to allocate allowances; whether to sell allowances to existing sources of emissions or give them away; whether to establish reserves for new sources; etc. Fourth, in order to prevent wild swings in allowance prices, a variety of flexibility mechanisms have been suggested, including a “safety valve”(a price at which the regulatory authority would sell additional allowances if the market cost rose above predicted levels); the banking excess allowances (achieved through early reductions) for later use; borrowing authority; etc. Others have proposed a floor below which prices would not be allowed to fall, to reduce risk for sources that make GHG reductions. If a safety valve or floor were established, the price of additional allowances and/or the floor price would be key determinants of the stringency of the program. Fifth, there are a number of issues related to whether and how to permit international trading of allowances. Many of the least cost GHG reduction options may be in developing countries, but verification of the baseline emissions and of the continued application of emission controls could pose challenges to the regulatory authority in such cases. Similar questions are raised by potential domestic or international offsets to emissions, in the form of sequestration activities.<sup>11</sup>

**What Role for Carbon Taxes?** The complications of establishing a viable cap-and-trade program suggest to some (especially to those trained in economics) that the simplest approach to controlling emissions would simply be to impose a carbon or GHG tax. From the point of view of economic efficiency, administrative ease, and comprehensiveness, a carbon tax has many advantages, but Congress has found it difficult to impose new taxes, limiting support for this option. It is worth noting that the “safety valve” discussed in the cap-and-trade section above would function to some extent like a carbon tax, and might represent a compromise between these two options.

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<sup>10</sup> For additional information on the EU trading system, see CRS Report RL33581, *Climate Change: The European Union's Emissions Trading System (EU-ETS)*, by Larry Parker.

<sup>11</sup> For a broader discussion of issues faced in designing a GHG reduction program, see CRS Report RL33799, *Climate Change: Design Approaches for a Greenhouse Gas Reduction Program*, by Larry Parker.

**The Role of State Programs.** Finally, as noted earlier, a number of states have begun programs to reduce GHG emissions. Although the federal government is challenging some of these, particularly those affecting mobile sources, states do have clear authority to regulate emissions from power plants, landfills, residential and commercial buildings, and other sources of GHGs. The extent to which such state programs might serve as national models is one issue; another is the degree to which a federal program might preempt state measures affecting similar sources.

## Other Clean Air Issues

In addition to climate change, there are a number of clean air issues in which Congress has expressed an interest. Several of these issues have already been the subject of oversight hearings.

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<sup>12</sup>; 88 million lived in areas that were nonattainment for fine particles (PM<sub>2.5</sub>).<sup>13</sup>

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.<sup>14</sup>

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<sub>2.5</sub>.) The agency attributes at least 33,000 premature deaths and millions of lost work days annually to exceedances of the PM<sub>2.5</sub> 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, the remainder of this report provides a discussion of several interrelated air issues of interest in the 110<sup>th</sup> Congress, including revision

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<sup>12</sup> Data for ozone nonattainment areas are from the U.S. EPA "Green Book," at [<http://www.epa.gov/oar/oaqps/greenbk/gntc.html>].

<sup>13</sup> Data for PM<sub>2.5</sub> nonattainment areas are also from the U.S. EPA "Green Book," at [<http://www.epa.gov/oar/oaqps/greenbk/qntc.html>].

<sup>14</sup> See U.S. EPA, "Air Emission Trends — Continued Progress Through 2005," at [<http://www.epa.gov/airtrends/econ-emissions.html>].

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 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.<sup>15</sup>) 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 PM<sub>2.5</sub>, 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<sub>2.5</sub> in the air averaged over 24-hour periods from 65 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) to 35  $\mu\text{g}/\text{m}^3$ ; the annual standard, set at 15  $\mu\text{g}/\text{m}^3$ , 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  $\mu\text{g}/\text{m}^3$  and an annual standard in the range of 13 to 14  $\mu\text{g}/\text{m}^3$ . Of the 22 CASAC panel members, 20 concurred in the recommendation.<sup>16</sup>

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..."<sup>17</sup> The Administrator agrees with CASAC that the science shows a relationship between higher levels of PM<sub>2.5</sub> and an array of adverse health effects, but he believes there is too much uncertainty in the analysis to justify lowering the annual standard.<sup>18</sup> He also noted that the EPA is undertaking substantial research to clarify which aspects

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<sup>15</sup> 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>].

<sup>16</sup> 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.

<sup>17</sup> U.S. EPA, National Ambient Air Quality Standards for Particulate Matter, Proposed Rule, Preamble, 71 *Federal Register* 2651, Jan. 17, 2006.

<sup>18</sup> See discussion beginning at 71 *Federal Register* 61172, Oct. 17, 2006.

**Table 1. Pre-existing, Recommended, and New NAAQS for PM<sub>2.5</sub>**

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

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 (PM<sub>2.5</sub>): National Ambient Air Quality Standards (NAAQS) Implementation*, by Robert Esworthy.

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<sub>2.5</sub> 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."<sup>19</sup>

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<sub>10-2.5</sub>. In its last review of the particulate standards (in 1997), the EPA had regulated these as particles 10 microns or smaller (PM<sub>10</sub>), a category that overlapped the PM<sub>2.5</sub> category. Challenged in the D.C. Circuit Court of Appeals, the PM<sub>10</sub> standard was remanded to the EPA, the court having concluded that PM<sub>10</sub> is a "poorly matched indicator" for thoracic coarse particles because it includes the smaller PM<sub>2.5</sub> category as well as the larger particles. In response, in January 2006, the EPA proposed a 24-hour standard for PM<sub>10-2.5</sub>. The standard would have been set at a level of 70 µg/m<sup>3</sup>, compared with the current 24-hour PM<sub>10</sub> standard of 150 µg/m<sup>3</sup>. The final standards promulgated in October reversed course, leaving in place the current form of the standard (PM<sub>10</sub>) and the current level (150 µg/m<sup>3</sup>). The only change to the PM<sub>10</sub> 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<sub>10</sub> 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<sub>10</sub> and PM<sub>2.5</sub>. With regard to PM<sub>2.5</sub>, the letter stated: "CASAC is

<sup>19</sup> 71 *Federal Register* 2652, Jan. 17, 2006.

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.”<sup>20</sup> 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) ....”*<sup>21</sup>

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 benefits of the new PM standards.<sup>22</sup> 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.<sup>23</sup> 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

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<sup>20</sup> 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>].

<sup>21</sup> Ibid. Italics in original.

<sup>22</sup> [<http://epa.gov/pm/actions.html>].

<sup>23</sup> 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.

Elicitation”<sup>24</sup> 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.<sup>25</sup> 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  $\mu\text{g}/\text{m}^3$ ) would increase the cost by about 50%, to \$7.9 billion annually, according to the agency, but would nearly double the estimated benefits.<sup>26</sup> Thus, the benefit-cost ratio would be more favorable, according to the agency’s analysis, had the Administrator chosen the more stringent standard.

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.

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<sup>24</sup> 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  $\text{PM}_{2.5}$  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  $\text{PM}_{2.5}$  Exposure and Mortality*, Sept. 21, 2006.

<sup>25</sup> “Stronger Soot Rule Could Avert 30,000 Premature Deaths — EPA Report,” *E&E News PM*, Sept. 22, 2006.

<sup>26</sup> U.S. EPA, *Regulatory Impact Analysis of the 2006 National Ambient Air Quality Standards for Fine Particle Pollution ( $\text{PM}_{2.5}$ )*, Table ES-1, available at [<http://epa.gov/pm/actions.html>].

**Table 2. Estimated Costs and Benefits of the EPA's New PM<sub>2.5</sub> 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.

**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<sub>2.5</sub> 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.

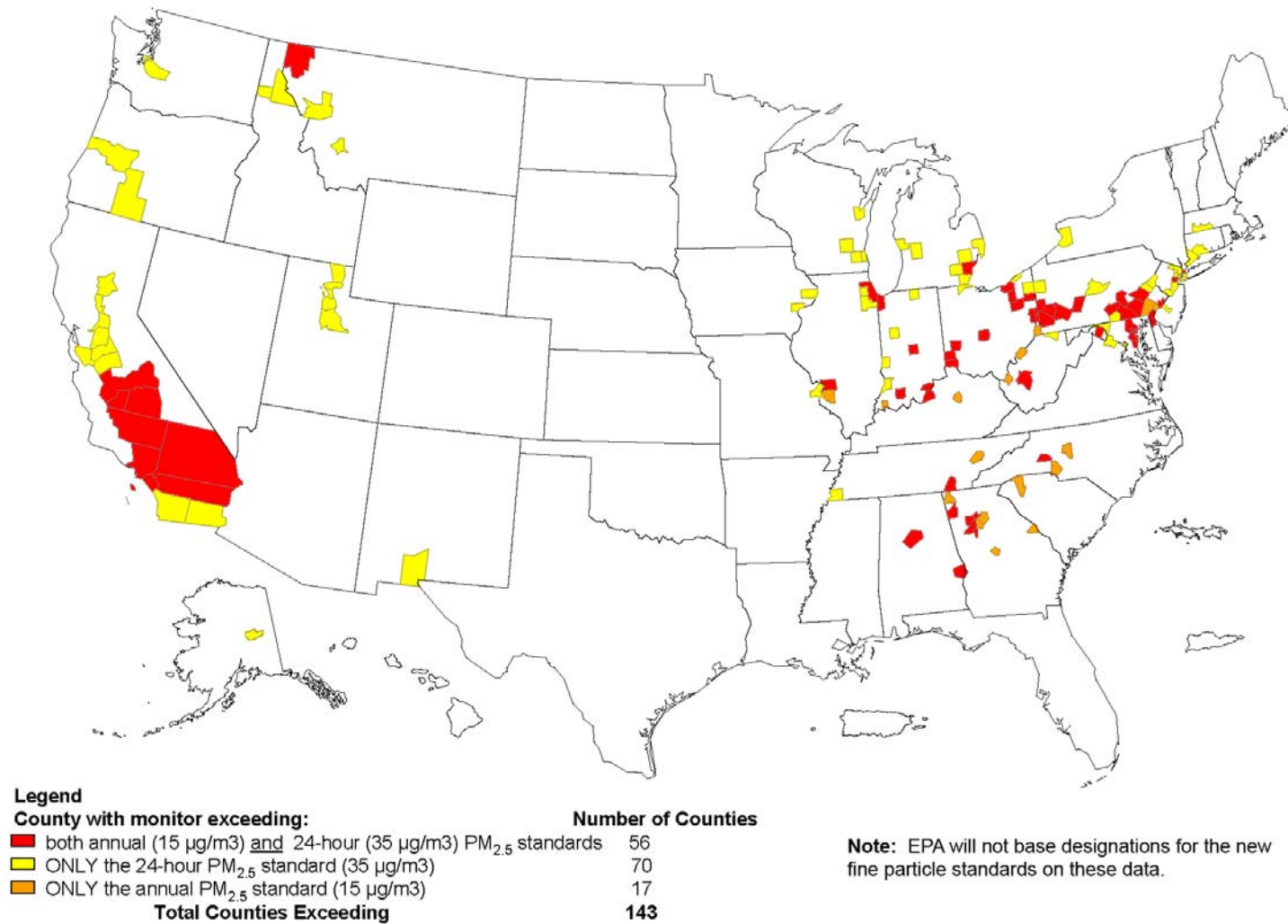
**Issues.** A number of issues were raised during consideration of the proposed standards, and most remain in the wake of the Administrator's decision. Those who would like to see stronger standards (including a number of states and environment and health groups) have focused on the agency's disregard of CASAC's recommendation that the annual PM<sub>2.5</sub> 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."<sup>27</sup> 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.)

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<sup>27</sup> 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.

**Figure 1. Counties Exceeding Revised PM<sub>2.5</sub> Standards,  
Based on 2003-2005 Monitoring Data**



Source: U.S. EPA.

## 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<sup>28</sup> 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 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 five-year cycle as required by the Clean Air Act, without compromising the scientific integrity of the process,”<sup>29</sup> 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.

Although the new NAAQS review procedures will change the role that CASAC has historically played, CASAC, at first, appeared less concerned with the changes than some who have advocated on its behalf. When the December 7 decision memorandum was released, the committee’s Chair said CASAC did not plan to issue a formal response. In response to a draft of the changes, the committee had 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 into the

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<sup>28</sup> 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.

<sup>29</sup> “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](http://www.epa.gov/ttn/naaqs/memo_process_for_reviewing_naaqs.pdf)].

decision memorandum. The memorandum also addressed another 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 EPA taking comments from CASAC at the same time that it considers comments from the public, CASAC's Chair was reported to say, "(S)ome of the members were concerned but most are not, because it doesn't change CASAC's ability to comment."<sup>30</sup>

In early February 2007, however, reports circulated that CASAC had changed its mind. After its first experience with the new NAAQS review process (at a meeting to consider the NAAQS for lead),<sup>31</sup> it was reported that the committee would compose a letter to the EPA Administrator critical of the new process:

Henderson [CASAC Chair Dr. Rogene Henderson] said that when EPA first proposed the NAAQS process changes in response to a memo by Deputy Administrator Marcus Peacock, CASAC had "misunderstood how it would be implemented."

However, "the full consequences became apparent in the lead meeting," she said, with panel members concerned about not being able to review staff recommendations. The new process "does not allow CASAC time for appropriate input to evaluate the science," she said.<sup>32</sup>

Reaction elsewhere has been stronger. Responding to the changes at the time of their announcement, the incoming Chair of the Environment and Public Works Committee, Senator Barbara Boxer, called them "unacceptable," and said the committee planned to make them a top priority for oversight in the 110<sup>th</sup> Congress.<sup>33</sup> (The committee included them among the topics it considered February 6, 2007, in a hearing on "Oversight of Recent EPA Decisions.") Seven Democratic members of the committee, including Senator Boxer, wrote EPA Administrator Johnson, December 21, 2006, to express their strong opposition to the changes and to ask him to "abandon" them.<sup>34</sup> Thus, it would not be surprising if the role of CASAC in NAAQS reviews were the subject of further scrutiny in the 110<sup>th</sup> Congress.

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<sup>30</sup> Comment of Dr. Rogene Henderson, CASAC Chair, in "EPA Adviser Plays Down Democrats' Criticism over New NAAQS Changes," *Inside EPA Clean Air Report*, December 14, 2006.

<sup>31</sup> A CASAC Review Panel met to consider the Lead NAAQS on February 6-7, 2007.

<sup>32</sup> "Advisory Panel to Recommend Stricter Limit for Agency's Air Quality Standard for Lead," *Daily Environment Report*, February 9, 2007, p. A-1.

<sup>33</sup> Office of Senator Barbara Boxer, "Boxer Statement on EPA's Politicization of Clean Air Health Standards," Press Release, December 8, 2006, at [<http://boxer.senate.gov/news/releases/record.cfm?id=266781>].

<sup>34</sup> Office of Senator Barbara Boxer, "Democratic Members of Senate EPW Committee Warn EPA on Air Rollbacks," Press Release, December 21, 2006, at [<http://boxer.senate.gov/news/releases/record.cfm?id=267092>].

## Revision of the NAAQS for Lead

As a result of a suit filed by the Missouri Coalition for the Environment and others in May 2004,<sup>35</sup> EPA is under court order to complete a review of the NAAQS for lead by September 1, 2008. The lead NAAQS was promulgated in 1978. Despite the Clean Air Act requirement that NAAQS be reviewed every five years, a review of the standard has not been completed since that time.<sup>36</sup>

In 1978, when the lead standard was promulgated, lead was widely prevalent in the air, largely because of exhaust from automobiles running on leaded gasoline. EPA phased out leaded gasoline in the 1980s and early 1990s. As a result, average concentrations of lead in ambient air have dropped 96%, according to EPA, and there are now only two nonattainment areas for lead: East Helena, MT, and Herculaneum, MO, with a combined population of 4,664 people. Both of these towns were sites of lead smelters that operated for more than 100 years, contaminating air, water, and soil nearby.

As part of the current lead NAAQS review, EPA completed a Criteria Document for lead in October 2006 and a first draft of a Staff Paper or “Policy Assessment” in December 2006. The Criteria Document concluded that lead-related health effects occur at blood lead levels lower than previously reported, which might argue for a more stringent NAAQS; but the Staff Paper, noting the dramatic reductions in airborne lead emissions, the shift in types of sources, and the listing of lead compounds as hazardous air pollutants (capable of being controlled under a different section of the Clean Air Act), raised the possibility that EPA would revoke the lead NAAQS.<sup>37</sup> This would leave lead emissions subject to Maximum Achievable Control Technology and area source standards to be promulgated under Section 112 of the act.

The possibility that EPA would revoke the lead NAAQS was among the subjects reviewed by CASAC at a February 6-7, 2007 meeting. In a letter following the meeting, the panel unanimously opposed revocation and recommended a strengthening of the NAAQS from its current level of  $1.5 \mu\text{g}/\text{m}^3$  averaged quarterly to “about  $0.2 \mu\text{g}/\text{m}^3$  or less”, averaged monthly.<sup>38</sup> The lead NAAQS was also discussed at a Senate Environment and Public Works Committee hearing February 6. As noted earlier, the lead NAAQS review is also the first review being undertaken under EPA’s new NAAQS review procedures, the implementation of which appears to have generated controversy.

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<sup>35</sup> Missouri Coalition for the Environment v. U.S. EPA, 2005 WL 2234579 (E.D. Mo. Sept. 14, 2005).

<sup>36</sup> EPA began a lead NAAQS review and issued a Criteria Document in 1986 and a Staff Paper in 1990, but the agency never completed the review: i.e., there was no final decision published in the *Federal Register*.

<sup>37</sup> See U.S. EPA, “Fact Sheet: First Draft Staff Paper for Lead,” December 2006, p. 3 at [[http://www.epa.gov/ttn/naaqs/standards/pb/s\\_pb\\_cr\\_sp.html](http://www.epa.gov/ttn/naaqs/standards/pb/s_pb_cr_sp.html)].

<sup>38</sup> Letter of Dr. Rogene Henderson, Chair, CASAC, to Hon. Stephen L. Johnson, EPA Administrator, March 27, 2007, at [<http://www.epa.gov/sab/pdf/casac-07-003.pdf>].

## 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 in recent years 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<sub>2</sub>) 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<sub>2.5</sub>), 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 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 NO<sub>x</sub> (which contributes to the formation of ozone) and SO<sub>2</sub> (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<sup>39</sup>) would address the major pollutants on a coordinated schedule and would rely,

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<sup>39</sup> The Administration first proposed the Clear Skies Act on Feb. 14, 2002, and the bill was introduced by request in the 107<sup>th</sup> Congress as H.R. 5266/S. 2815. In the 109<sup>th</sup> Congress, (continued...)

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<sub>2</sub>), 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 110th 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<sub>2</sub>, NO<sub>x</sub>, 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<sub>2</sub> 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<sub>2</sub>, NO<sub>x</sub>, and mercury controls; established a CO<sub>2</sub> 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 109<sup>th</sup> Congress*, by Larry Parker and John Blodgett.)

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<sub>2</sub> emissions. The Administration has rejected mandatory controls on CO<sub>2</sub>, 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<sub>2</sub> 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<sub>2</sub> controls, the Administration is supported by most

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<sup>39</sup> (...continued)

a somewhat modified Clear Skies bill was introduced as S. 131.

in the utility and coal industries. Others, mostly outside these industries but including some utilities, view CO<sub>2</sub> controls as inevitable, and perhaps desirable, and support simultaneous implementation of cap-and-trade programs for CO<sub>2</sub> 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<sub>2</sub> and NO<sub>x</sub> in 28 eastern states and the District of Columbia.<sup>40</sup> 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<sub>2</sub> will decline 53% by 2015 and NO<sub>x</sub> 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.<sup>41</sup> 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.)

## 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.<sup>42</sup> The mercury regulations (which, like CAIR, are based on the Clear Skies approach) rely almost entirely on co-benefits of regulating SO<sub>2</sub> and NO<sub>x</sub>. 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

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<sup>40</sup> The rule appeared in the *Federal Register* on May 12, 2005 (70 FR 25162).

<sup>41</sup> U.S. EPA, Office of Air and Radiation, "Clean Air Interstate Rule — Basic Information," available at [<http://www.epa.gov/interstateairquality/basic.html>].

<sup>42</sup> 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).

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 would have met the agency's requirement under the consent agreement by setting 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 used 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 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.<sup>43</sup> (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

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<sup>43</sup> 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](http://www.epa.gov/ttn/atw/utility/ria_final.pdf)].

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<sub>2</sub>, NO<sub>x</sub>, 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<sub>2</sub> 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, *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.<sup>44</sup> The agency's cost-benefit analysis also did not include several peer-reviewed studies that indicated stricter utility mercury rules would have

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<sup>44</sup> 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>].

yielded large benefits. Thus, opponents, including at least 15 states, have filed suit to overturn the rule.<sup>45</sup>

In September 2005, the Senate considered, but narrowly defeated, a challenge to the rule under the Congressional Review Act.<sup>46</sup>

## **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 use of it to require the installation of best available pollution controls on existing stationary sources of air pollution that have been modified. The Clean Air Act requires that plants undergoing modifications meet these NSR requirements, 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

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<sup>45</sup> New Jersey v. EPA, No. 05-1097 (D.C. Cir.) Filed Mar. 29, 2005.

<sup>46</sup> 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.

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.<sup>47</sup> In a second case, decided in April 2004 but appealed all the way 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.<sup>48</sup> On April 2, 2007, the Supreme Court overturned the lower court rulings in a unanimous decision, finding that EPA's regulations, promulgated in 1980, clearly specified an increase in actual annual emissions as the measure of whether a permit for a modification was required. To argue otherwise now would be to challenge the validity of the regulations, the Court concluded; such a challenge needs to be filed with the D.C. Circuit Court of Appeals within 60 days of a regulation's promulgation – it cannot be done more than 20 years later in the Fourth Circuit.<sup>49</sup>

While pursuing these enforcement actions, the Bush Administration has promulgated a number of changes to the NSR regulations that would make future 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.<sup>50</sup> 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.

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<sup>47</sup> United States v. Ohio Edison Co., No. C-2-99-1181, [S.D. Ohio].

<sup>48</sup> 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].

<sup>49</sup> The decision, *Environmental Defense v. Duke Energy Corp.*, April 2, 2007, can be found at [<http://www.supremecourtus.gov/opinions/06pdf/05-848.pdf>].

<sup>50</sup> These changes appeared in the *Federal Register* on Oct. 27, 2003 (68 FR 61247).

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.<sup>51</sup>

The EPA proposed further changes to the NSR regulations on October 20, 2005, and September 8, 2006<sup>52</sup>; 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.<sup>53</sup> In addition, as noted earlier, the Supreme Court has now overturned the Fourth Circuit decision that EPA used as an argument for its proposed rule.

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

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<sup>51</sup> State of New York v. EPA, No. 03-1380, 2006 Westlaw 662746 [D.C. Cir., Mar. 17, 2006].

<sup>52</sup> 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](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.

<sup>53</sup> Memorandum of Adam M. Kushner, Director, Air Enforcement Division, U.S. EPA, to William Harnett, Director, Information Transfer and Program Integration Division, Office of Air Quality Planning and Standards, Aug. 25, 2005, p. 1.

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.<sup>54</sup> (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."<sup>55</sup> 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<sub>2</sub> and NO<sub>x</sub> 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.<sup>56</sup>

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<sub>2</sub> and NO<sub>x</sub> emission increases in some locations and decreases in others."<sup>57</sup> 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

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<sup>54</sup> 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.

<sup>55</sup> 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.

<sup>56</sup> National Research Council of the National Academies, *New Source Review for Stationary Sources of Air Pollutants* (Washington, DC: The National Academies Press, 2006), Prepublication Copy, p. 3.

<sup>57</sup> *Ibid.*, p. 5.

emissions, human health, energy efficiency, or on other relevant activities at facilities subject to the revised NSR program.<sup>58</sup>

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.<sup>59</sup>

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<sup>58</sup> Ibid., p. 2.

<sup>59</sup> National Academy of Public Administration, *A Breath of Fresh Air: Reviving the New Source Review Program*, Summary Report, April 2003, p. 3.