

# CRS Report for Congress

## Particulate Matter (PM<sub>2.5</sub>): Implementation of the 1997 National Ambient Air Quality Standards (NAAQS)

Updated October 14, 2008

Robert Esworthy  
Specialist in Environmental Policy  
Resources, Science, and Industry Division



Prepared for Members and  
Committees of Congress

# Particulate Matter (PM<sub>2.5</sub>): Implementation of the 1997 National Ambient Air Quality Standards (NAAQS)

## Summary

Particulate matter (PM), including fine particulate matter (PM<sub>2.5</sub>) and larger, but still inhalable particles (PM<sub>10</sub>), is one of the six principal pollutants for which the U.S. Environmental Protection Agency (EPA) has set National Ambient Air Quality Standards (NAAQS) under the Clean Air Act (CAA). Primary NAAQS are designed to protect human health, with an adequate margin of safety. After years of litigation and other delays, EPA is implementing the NAAQS for PM<sub>2.5</sub> promulgated in 1997. This report outlines the implementation process for the 1997 PM<sub>2.5</sub> NAAQS and describes issues raised as EPA and states develop implementation strategies.

The EPA's final designation of 38 areas, consisting of 205 counties in 20 states and the District of Columbia, as "nonattainment" (out of compliance) areas for the 1997 PM<sub>2.5</sub> NAAQS became effective in April 2005. A combined population of almost 90 million resides in these areas. States with PM<sub>2.5</sub> nonattainment areas are required to develop comprehensive implementation plans, referred to as State Implementation Plans (SIPs), demonstrating how attainment will be reached by a designated deadline. SIPs include pollution control measures that rely on models of the impact on air quality of projected emission reductions to demonstrate attainment. States were required to submit SIPs for the 1997 PM<sub>2.5</sub> NAAQS by April 2008, but EPA did not begin receiving most of them until July 2008. States must be in compliance by 2010, unless they are granted an extension.

A number of issues will continue to be debated as the implementation of the 1997 PM<sub>2.5</sub> NAAQS progresses. The U.S. Court of Appeals for the D.C. Circuit's July 11, 2008, decision (*North Carolina v. EPA*) to vacate the Clean Air Interstate Rule (CAIR) could further delay implementation, which has heightened interest in Congress. CAIR was expected to assist states in addressing upwind emission contributions for achieving attainment of the 1997 PM<sub>2.5</sub> NAAQS. In addition, other EPA rulemakings promulgated and proposed that influence various aspects of regulating air quality could affect the PM<sub>2.5</sub> NAAQS implementation process. EPA's April 25, 2007, final "PM<sub>2.5</sub> implementation" rule to provide guidance and procedures for establishing controls to achieve and maintain attainment has raised concerns. Six petitions for review of the rule were filed with the D.C. Circuit, and two petitions for reconsideration have been filed with EPA. Additionally, as required under the CAA, EPA reviewed the PM<sub>2.5</sub> and PM<sub>10</sub> NAAQS, and on October 17, 2006, promulgated final revisions that included a strengthening of the 1997 PM<sub>2.5</sub> standard. Pending judicial actions regarding these new PM NAAQS could affect implementation of the 1997 PM<sub>2.5</sub> NAAQS.

Many questions and concerns remain, including whether special provisions can be made for meeting attainment deadlines, particularly for areas affected by upwind pollution, and how nonattainment designation might affect economic development.

## Contents

Introduction .....	1
The 1997 PM <sub>2.5</sub> Standards .....	2
Overview: Key Issues .....	2
Compliance Schedule .....	3
Timeliness of Implementation Guidance .....	3
The Clean Air Interstate Rule (CAIR) and Other Federal Requirements .....	4
EPA's 2006 Revisions to the PM NAAQS .....	5
Geographical Area Designation Process .....	6
The NAAQS Designation Process .....	6
1997 PM <sub>2.5</sub> NAAQS Designation Process .....	7
1997 PM <sub>2.5</sub> Area Designations Timeline .....	8
Demonstrating Attainment with the 1997 PM <sub>2.5</sub> NAAQS .....	12
The State Implementation Plan (SIP) .....	13
EPA's PM <sub>2.5</sub> Implementation Rule .....	13
Transportation Conformity .....	14
Upwind Pollutant Contributions: § 126 of the CAA .....	15
Grant Programs .....	16
Recent Actions and Their Implications for Achieving Attainment of the 1997 PM <sub>2.5</sub> NAAQS .....	17
D.C. Circuit's Decision Vacating the Clean Air Interstate Rule (CAIR) .....	17
Completion of EPA's Most Recent Review of the Particulates NAAQS and the September 2006 Changes .....	20
Congressional Action Related to Particulates NAAQS Implementation .....	22
Conclusion .....	24
Appendix. Implementation of the 1997 PM <sub>2.5</sub> NAAQS: Timeline and Delays .....	26

## List of Figures

Figure 1. EPA Designations of Nonattainment Areas for the 1997 PM <sub>2.5</sub> National Ambient Air Quality Standards (NAAQS) .....	11
--	----

## List of Tables

Table 1. Areas Previously Identified as Nonattainment for 1997 PM <sub>2.5</sub> NAAQS Designated as Attaining the Standards .....	10
Table 2. Schedule for Implementation of the 1997 PM <sub>2.5</sub> NAAQS .....	26

# Particulate Matter (PM<sub>2.5</sub>): Implementation of the 1997 National Ambient Air Quality Standards (NAAQS)

## Introduction

National Ambient Air Quality Standards (NAAQS) are a core component of the Clean Air Act (CAA).<sup>1</sup> NAAQS do not regulate emission sources directly; rather, they define the level of pollution in ambient (outdoor) air above which health and welfare effects occur. The statute requires that, based on a review of the scientific literature, the Environmental Protection Agency (EPA) set (1) “primary” standards at a level “requisite to protect the public health” with an “adequate margin of safety” and (2) “secondary” standards at a level “requisite to protect the public welfare.”<sup>2</sup> NAAQS have been promulgated for six principal pollutants classified by EPA as “criteria pollutants”: sulfur oxides measured in terms of sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), ozone, lead, and particulate matter.

This report provides an overview of the NAAQS implementation process in the context of the 1997 standards for fine particulate matter (PM<sub>2.5</sub>), which consists of particles less than 2.5 micrometers in diameter. The EPA is in the process of implementing the NAAQS for particulates promulgated in 1997,<sup>3</sup> delayed because of court challenges and other factors. The EPA’s 1997 revisions to the particulate matter standards (also referred to as the particulates NAAQS) included separate requirements for PM<sub>2.5</sub> for the first time. The PM<sub>2.5</sub> NAAQS have been the source of significant concern and national debate. Congress has been particularly interested in EPA’s promulgation and implementation of the CAA standards, and has held numerous hearings on particulate matter (and ozone) NAAQS established in 1997.

---

<sup>1</sup> Sections 108 and 109 of the CAA govern the establishment, review, and revisions of NAAQS (42 U.S.C. 7408 and 7409). See CRS Report 97-722, *Air Quality Standards: The Decisionmaking Process*, by John Blodgett and Larry Parker.

<sup>2</sup> 42 U.S.C. 7409(b)(1) for “primary”; 42 U.S.C. 7409(b)(2) and 7602(h) for “secondary.” The use of public welfare in the CAA “includes, but is not limited to, effects on soils, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being, whether caused by transformation, conversion, or combination with other air pollutants” (42 U.S.C. 7602(h)).

<sup>3</sup> 62 *Federal Register* 38652-38760, July 18, 1997.

## The 1997 PM<sub>2.5</sub> Standards

Beginning in 1971, regulation and monitoring of particulate matter under the CAA focused primarily on total suspended particles (TSP) and, eventually, on coarse particles equal to or less than 10 micrometers in diameter (PM<sub>10</sub>).<sup>4</sup> After extensive analysis and review, EPA revised the particulates standards in 1997<sup>5</sup> to provide separate requirements for fine particulate matter (PM<sub>2.5</sub>) based on its links to several types of cardiovascular and respiratory health problems, including aggravated asthma and bronchitis, and to premature death.<sup>6</sup>

The primary (health) PM<sub>2.5</sub> NAAQS requirements, which became effective on September 16, 1997,<sup>7</sup> are the same as the secondary (welfare) requirements. The 1997 PM<sub>2.5</sub> standards are set at

- an annual maximum concentration of 15 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ), based on the three-year average of the annual arithmetic mean PM<sub>2.5</sub> concentrations from one or more community-oriented monitors,<sup>8</sup> and
- a 24-hour concentration of 65  $\mu\text{g}/\text{m}^3$ , based on the three-year average of the 98<sup>th</sup> percentile of 24-hour PM<sub>2.5</sub> concentrations at each population-oriented monitor<sup>9</sup> within an area.

### Overview: Key Issues

A key component of implementing the 1997 PM<sub>2.5</sub> NAAQS is EPA's designations of geographical areas for being in "attainment" (in compliance) or "nonattainment" (out of compliance) of the air quality standards for PM<sub>2.5</sub>. As of August 2008, EPA's final designations included all or part of 205 counties<sup>10</sup> in 20

---

<sup>4</sup> 52 *Federal Register* 24634-24715, July 1, 1987.

<sup>5</sup> 62 *Federal Register* 38652-38760, July 18, 1997. See also U.S. EPA Fact Sheet, *EPA's Revised Particulate Matter Standards*, July 17, 1997, [<http://www.epa.gov/ttn/oarpg/naaqsfm/pmfact.html>].

<sup>6</sup> For an update of EPA's health effects and other particulates-related research activities, see [<http://www.epa.gov/pmresearch/>].

<sup>7</sup> 62 *Federal Register* 38652-38760, July 18, 1997.

<sup>8</sup> Community-oriented monitoring zones are defined as "an optional averaging area with well established boundaries such as county or census block" (40 *CFR* Part 58 Subpart A).

<sup>9</sup> Population-oriented monitoring (or sites) applies to "residential areas, commercial areas, recreational areas, industrial areas, and other areas where a substantial number of people may spend a significant fraction of their day" (40 *CFR* Part 58 Subpart A).

<sup>10</sup> All designated counties and partial counties, including Indian Country, geographically located within such areas, except as otherwise indicated by EPA. See EPA's PM<sub>2.5</sub> Designations website at [<http://www.epa.gov/pmdesignations>].

states and the District of Columbia for nonattainment of the 1997 PM<sub>2.5</sub> NAAQS.<sup>11</sup> A combined population of almost 90 million resides in these nonattainment areas. The final designations were based on EPA's consideration of air monitoring data and recommendations provided by states and tribes. The designation of nonattainment areas has raised questions and concerns, particularly for those areas designated as such for the first time.

**Compliance Schedule.** Nonattainment designation began a process in which states (and tribes) must develop and adopt emission control programs sufficient to bring air quality into compliance by a statutorily defined deadline. States were required to submit, by April 2008, their State Implementation Plans (SIPs) for how the designated nonattainment areas will meet the 1997 PM<sub>2.5</sub> NAAQS. According to EPA, nine of the 57 SIPs (there are 38 areas, but some have multiple states submitting individual SIPs) had been submitted as of the end of August 2008.<sup>12</sup> States with nonattainment areas must be in compliance with the 1997 PM<sub>2.5</sub> NAAQS by April 5, 2010, unless they are granted an extension.<sup>13</sup>

**Timeliness of Implementation Guidance.** Concerns have been raised regarding compliance deadlines with respect to EPA's timely provision of implementation procedures and guidance for achieving and maintaining compliance with the 1997 PM<sub>2.5</sub> NAAQS. The EPA published its final "PM<sub>2.5</sub> implementation" rule on April 25, 2007.<sup>14</sup> Six petitions for review of EPA's implementation rule have been filed with the U.S. Court of Appeals for the District of Columbia (D.C.) Circuit,<sup>15</sup> and two petitions for reconsideration have been filed with EPA.<sup>16</sup> Given

<sup>11</sup> The EPA published a final supplemental rule on April 14, 2005 (*70 Federal Register* 19844) amending the agency's initial final designations published in the January 5, 2005, *70 Federal Register* 944-1019, re-designating as attainment/unclassifiable 17 counties previously designated nonattainment. Subsequently, in the August 25, 2008, *73 Federal Register* 49949, EPA announced its determination that a three-county (Harrisburg, Lebanon, Carlisle) Pennsylvania nonattainment area for the 1997 PM<sub>2.5</sub> NAAQS, had achieved attainment.

<sup>12</sup> Information provided directly to CRS by the EPA Office of Air Quality Planning and Standards (OAQPS) based on consultation with the EPA Regions.

<sup>13</sup> Under section 172(a)(2)(A) of the CAA, EPA may grant an area an extension of the initial attainment date for one to five years (in no case later than 10 years after the designation date for the area). A state requesting an extension must submit an implementation plan (SIP) by the required deadline that includes, among other things, sufficient information demonstrating that attainment by the initial attainment date is "impracticable."

<sup>14</sup> *72 Federal Register* 20586 — 20667, April 25, 2007.

<sup>15</sup> The six petitions are: Earthjustice on behalf of American Lung Association, National Resources Defense Council, Sierra Club and Medical Advocates for Healthy Air (*American Lung Association v. EPA*, No. 07-1233, D.C. Cir. filed June 26, 2007); National Environmental Development Association's Clean Air Project (NEDA CAP); National Petrochemical & Refiners Association; State of New York; State of New Jersey; National Cattlemen's Beef Association.

<sup>16</sup> Earthjustice, Petition for Reconsideration, *Final Clean Air Fine Particle Implementation*, filed before the Administrator of the U.S. Environmental Protection Agency, June 25, 2007, (continued...)

that states were required to submit their SIPs by April 2008, state and local air pollution control agencies,<sup>17</sup> as well as some Members of Congress,<sup>18</sup> had expressed their concerns about the delays in publishing a final implementation rule<sup>19</sup> and the lack of guidance.

**The Clean Air Interstate Rule (CAIR) and Other Federal Requirements.** The EPA concluded that in many cases implementing national strategies — including the 1999 visibility protection regulations (Regional Haze Rule);<sup>20</sup> voluntary diesel engine retrofit programs; and federal standards scheduled to be implemented between 2004 and 2010 on cars, light trucks, heavy-duty, and nonroad diesel engines — would provide a framework for achieving attainment with the 1997 PM<sub>2.5</sub> NAAQS. The EPA's May 2005 final rule, the Clean Air Interstate Rule (CAIR),<sup>21</sup> was expected to serve as the primary tool to assist downwind states in meeting the PM<sub>2.5</sub> (and 8-hour ozone) NAAQS by mitigating interstate transport of sulfur dioxide (SO<sub>2</sub>) and nitrogen oxide (NO<sub>x</sub>) emissions from electric generating units that contribute to the formation of PM<sub>2.5</sub>.<sup>22</sup> CAIR covered 28 states in the eastern United States and the District of Columbia, including 26 jurisdictions in the PM<sub>2.5</sub> nonattainment region. As a preferred implementation strategy, EPA encouraged states to use a trading program to reduce emissions of target pollutants by up to 70%

---

<sup>16</sup> (...continued)

(Docket #EPA-HQ-OAR-2003-0062-0256 available at [<http://www.regulations.gov/search/index.jsp>]); and petition by the National Cattlemen's Beef Association (based on information received by CRS from EPA's Office of Air Quality Planning and Standards, March 19, 2008).

<sup>17</sup> Letter of Shelley Kaderly and Ursula Kramu, Co-Presidents, the National Association of Clean Air Agencies (NACAA, formerly the State and Territorial Air Pollution Program Administrators and the Association of Local Air Pollution Control Officials (STAPPA/ALAPCO)), to Hon. Stephen L. Johnson, EPA Administrator, February 16, 2007, available at [<http://www.4cleanair.org/TopicDetails.asp?parent=2#Particle%20Pollution>].

<sup>18</sup> Letter of the Hon. John D. Dingell, Chairman of the House Committee on Energy and Commerce, to Hon. Stephen L. Johnson, EPA Administrator, January 19, 2007, [[http://energycommerce.house.gov/Press\\_110/110pr\\_air\\_quality.shtml](http://energycommerce.house.gov/Press_110/110pr_air_quality.shtml)].

<sup>19</sup> The EPA had published a proposed rule November 1, 2005 (70 *Federal Register* 65984).

<sup>20</sup> 64 *Federal Register* 35714-35774, July 1, 1999. See CRS Report RL32483 *Visibility, Regional Haze, and the Clean Air Act: Status of Implementation* by Larry Parker and John Blodgett; also CRS Report RL32927, *Clean Air Interstate Rule: Review and Analysis*, by Larry Parker.

<sup>21</sup> Promulgated under the CAA, 42 U.S.C. 7401 et seq., 70 *Federal Register* 25162, May 12, 2005.

<sup>22</sup> Sulfur dioxide (SO<sub>2</sub>) is a precursor contributing to the formation of PM<sub>2.5</sub> concentrations, and NO<sub>x</sub> is a precursor (a pollutant that is transformed in air to form another air pollutant) contributing to the formation of both ozone and PM<sub>2.5</sub> concentrations. EPA has concluded that SO<sub>2</sub> and NO<sub>x</sub> emissions, through the phenomenon of air pollution transport, contribute significantly to downwind nonattainment, or interfere with maintenance, of the PM<sub>2.5</sub> and 8-hour ozone NAAQS (70 *Federal Register* 25162, May 12, 2005).

in a cost-effective manner.<sup>23</sup> However, in a July 11, 2008, decision (*North Carolina v. EPA*), the U.S. Court of Appeals for the D.C. Circuit vacated CAIR.<sup>24</sup> The court decision may require states to reconsider implementation plans (SIPs) already submitted and those pending submission for achieving or maintaining attainment with 1997 PM<sub>2.5</sub> NAAQS.<sup>25</sup> The court's decision to vacate the rule was the subject of a July 29, 2008, congressional hearing,<sup>26</sup> and the implications of this decision are expected to be the topic of further deliberation by Congress. In September 2008, EPA and other petitioners requested a rehearing of the D.C. Circuit's decision.<sup>27</sup>

**EPA's 2006 Revisions to the PM NAAQS.** Further complicating issues associated with achieving attainment of 1997 PM<sub>2.5</sub> NAAQS, EPA promulgated revisions to the NAAQS for particulate matter on October 17, 2006,<sup>28</sup> primarily a tightening of the 1997 standard for PM<sub>2.5</sub>.<sup>29</sup> The tightening of the PM<sub>2.5</sub> standards<sup>30</sup> increases the number of areas (defined by counties or portions of counties) in nonattainment.

EPA notified state and tribal representatives of the agency's intended designations of areas for nonattainment of the 2006 PM<sub>2.5</sub> NAAQS in letters dated August 19, 2008.<sup>31</sup> In response to nonattainment recommendations (based on 2004-2006 monitoring data) provided by states and tribes in December 2007, EPA identified 169 counties, and portions of 46 additional counties, for designation as nonattainment. States (and tribal groups) have 120 days to respond to EPA's recommendations. EPA expects to finalize the 2006 PM<sub>2.5</sub> NAAQS nonattainment designations (based on 2005-2007 monitoring data) by the end of 2008, with an

---

<sup>23</sup> See EPA's CAIR website at [<http://www.epa.gov/airmarkets/progsregs/cair/index.html>].

<sup>24</sup> 531 F.3d 896 (D.C. Cir. 2008).

<sup>25</sup> For a more detailed discussion of the court's decision and its implications, see CRS Report RL34589, *Clean Air After the CAIR Decision: Back to Square One?*, by James E. McCarthy, Larry Parker, and Robert Meltz.

<sup>26</sup> Senate Committee on Environment and Public Works, Subcommittee on Clean Air and Nuclear Safety, hearing, "EPA's Clean Air Interstate Rule (CAIR): Recent Court Decision and its Implications," July 29, 2008 [<http://epw.senate.gov/public/>].

<sup>27</sup> In addition to EPA, the Natural Resources Defense Council (NRDC), the National Mining Association, and the Utility Air Regulatory Group requested a rehearing.

<sup>28</sup> 71 *Federal Register* 61143-61233, October 17, 2006. See CRS Report RL33254, *Air Quality: EPA's 2006 Changes to the Particulate Matter (PM) Standard*, by Robert Esworthy and James E. McCarthy.

<sup>29</sup> Section 109(d)(1) of the CAA. According to the statute, EPA is required to review the latest scientific studies and either reaffirm or modify the NAAQS every five years, but reviews have occurred less frequently in practice.

<sup>30</sup> The new daily standard averaged over 24-hour periods is reduced from 65 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) to 35  $\mu\text{g}/\text{m}^3$  (71 *Federal Register* 61143-61233, October 17, 2006).

<sup>31</sup> For information regarding EPA's proposed designations, including correspondence between EPA and state and tribal representatives, see [<http://www.epa.gov/pmdesignations/2006standards/regs.htm#2>].



effective date of April 2009. SIPs would be due three years later, in April of 2012.<sup>32</sup> States are required to meet the 2006 revised PM<sub>2.5</sub> NAAQS no later than five years from the date of designation — April 2014 — unless granted an extension.<sup>33</sup> The EPA urged states to consider control strategies that may be useful in attaining the 2006 revised PM<sub>2.5</sub> NAAQS when developing control strategies for the 1997 PM<sub>2.5</sub> standards.<sup>34</sup> Further delays in implementing the 1997 NAAQS as a result of the court's decision regarding CAIR could result in some stakeholders advocating moving directly to implementation of the 2006 standards.

## Geographical Area Designation Process

### The NAAQS Designation Process<sup>35</sup>

The designation of geographical areas failing to comply with the NAAQS, based on monitoring and analysis of relevant air quality data, is a critical step in NAAQS implementation. The CAA establishes a process for designating nonattainment areas and setting their boundaries, but it allows the EPA Administrator some discretion in determining what the final boundaries of the areas will be. Areas are identified as “nonattainment” when they violate or contribute to the violation of NAAQS. Areas are identified as “attainment/unclassified”<sup>36</sup> when they meet the standard or when the data are insufficient for determining compliance with the NAAQS.<sup>37</sup>

---

<sup>32</sup> See EPA's guidance on its website: “Area Designations for 2006 24-Hour PM<sub>2.5</sub> NAAQS — Technical Information,” [[http://www.epa.gov/ttn/naaqs/pm/pm25\\_2006\\_techinfo.html](http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html)].

<sup>33</sup> Under section 172(a)(2)(A) of the CAA, EPA may grant an area an extension of the initial attainment date for one to five years (in no case later than 10 years after the designation date for the area) if a state demonstrates that severe air quality conditions prevent achieving attainment within the five years after designation. A state requesting an extension must submit an implementation plan (SIP) by the required deadline that includes, among other things, sufficient information demonstrating that attainment by the initial attainment date is “impracticable.”

<sup>34</sup> EPA's Advanced Notice of Proposed Rulemaking outlining an implementation plan for the transition to the January 17, 2006, proposed particulates NAAQS (71 *Federal Register* 6722, February 9, 2006).

<sup>35</sup> The EPA reported that 120 areas were designated as nonattainment for at least one of the six criteria pollutants (including particulate matter) as of August 2008 (EPA's *Criteria Pollutant Area Summary Report* (as of August 15, 2008; the data are periodically updated) at [<http://www.epa.gov/oar/oaqps/greenbk/anc12.html>]).

<sup>36</sup> Section 107(d)(1)(A)(iii) of the CAA provides that any area that EPA cannot designate on the basis of available information as meeting or not meeting the standards should be designated unclassifiable.

<sup>37</sup> The EPA “Greenbook” lists areas of the country where air pollution levels persistently exceed the national ambient air quality standards and may be designated as nonattainment. Current information on the location of NAAQS nonattainment areas is available on EPA's website at [<http://www.epa.gov/oar/oaqps/greenbk/>].

The designation process is intended as a cooperative federal-state-tribal<sup>38</sup> process in which states and tribes provide initial designation recommendations to EPA for consideration. In Section 107(d)(1)(A) (42 U.S.C. 7407), the statute states that the governor of each state shall submit a list to EPA of all areas in the state, “designating as ... nonattainment, any area that does not meet (*or that contributes to ambient air quality in a nearby area that does not meet*) an air quality standard” (emphasis added).

Following state and tribal designation submissions, the EPA Administrator has discretion to make modifications, including to the area boundaries. As required by statute (Section 107[d]1[B][ii]), the agency must notify the states and tribes regarding any modifications, allowing them sufficient opportunity to demonstrate why a proposed modification is inappropriate, but the final determination rests with EPA.

### **1997 PM<sub>2.5</sub> NAAQS Designation Process**

PM<sub>2.5</sub> attainment or nonattainment designations were made primarily on the basis of three-year federally referenced PM<sub>2.5</sub> monitoring data.<sup>39</sup> At the time the PM<sub>2.5</sub> NAAQS were being finalized in 1997, EPA began developing methods for monitoring fine particles. Using funding specifically authorized for this purpose in FY1998-FY2000 EPA appropriations,<sup>40</sup> the agency worked closely with states and tribes to initiate the deployment of a portion of the network of 1,200 monitors in January 1999. The majority of the monitors were not in place until January 2000. States and tribes were expected to rely on data collected during 2000-2002 for their recommendations. The EPA considered the 2001-2003 data to make the final PM<sub>2.5</sub> designations published in January 2005.

In its guidance document,<sup>41</sup> EPA identified several factors that would be considered in determining attainment with the 1997 PM<sub>2.5</sub> NAAQS and specified data and conditions that would not be acceptable. The EPA’s nonbinding guidance also included a recommendation that states and tribes consider using the same boundaries for nonattainment for both the PM<sub>2.5</sub> and eight-hour ozone standards, to facilitate

---

<sup>38</sup> Though not required to do so, tribes have been encouraged to submit recommendations. The area designation requirements under the CAA (Section 107) are specific with respect to states, but not to tribes. The EPA follows the same designation process for tribes per Sections 110(o) and 301(d) of the CAA and pursuant to the 1988 Tribal Authority Rule, which specifies that tribes shall be treated as states in selected cases (40 CFR Part 49). For information regarding tribes that have participated in the PM<sub>2.5</sub> designation recommendation process, see [<http://www.epa.gov/pmdesignations>].

<sup>39</sup> A federally referenced monitor is one that has been accepted for use by EPA for comparison of the NAAQS by meeting the design specifications and certain precision and bias (performance) specifications (40 CFR Part 58).

<sup>40</sup> Appropriations for monitoring averaged roughly \$50 million per year (P.L. 105-65, P.L. 105-226, P.L. 106-74).

<sup>41</sup> Information regarding EPA’s guidance for PM<sub>2.5</sub> designation is available on EPA’s PM<sub>2.5</sub> website at [[http://www.epa.gov/ttn/naaqs/pm/pm25\\_index.html](http://www.epa.gov/ttn/naaqs/pm/pm25_index.html)] and its Policy and Guidance website at [<http://www.epa.gov/ttn/oarpg>].

consistency in future implementation plans. The EPA expected that many of the PM<sub>2.5</sub> nonattainment areas would overlap with the eight-hour ozone designations.<sup>42</sup> However, PM<sub>2.5</sub> designations do not include nonattainment classifications based on severity as specified by statute for PM<sub>10</sub> and ozone, which have two and seven classifications, respectively. PM<sub>2.5</sub> is governed by the general nonattainment planning requirements of Title I (Part A and Part D, subpart 1) of the act.

The EPA recognized that determining the geographic extent of nearby source areas that contribute to nonattainment would be complicated. The CAA does not specifically require combining neighboring counties within the same nonattainment area, but it does require the use of metropolitan statistical area boundaries in the more severely polluted areas (Section 107(d)(4)(A)(iv)). Echoing this requirement, and similar to the eight-hour ozone approach, EPA recommended that Metropolitan Statistical Areas or Consolidated Metropolitan Statistical Areas<sup>43</sup> serve as the “presumptive boundary” for nonattainment areas under the 1997 PM<sub>2.5</sub> standards.

Metropolitan areas are generally treated as units, even when part of the area lies in a separate state or does not have readings exceeding the standards. In the latter case, even though a specific county may not exceed the standards, the pollution generated there is likely to influence PM<sub>2.5</sub> levels elsewhere in the metropolitan area. In addition, including the entire metropolitan area avoids the creation of additional incentives for sprawl development on the fringes of urban areas. For rural areas in violation of the 1997 PM<sub>2.5</sub> standards, EPA’s guidance presumed that the full county would be designated a nonattainment area.

The EPA has generally used its discretion to expand the size of nonattainment areas or to combine areas that a state listed as separate areas into a single larger unit. As it did in implementing other NAAQS, EPA also combined nonattainment counties across state lines into the same nonattainment area, if the counties are part of the same metropolitan area. Although, according to EPA, staff in the regions and the agency’s Office of Air Quality Planning and Standards were available for assistance and consultation throughout the designation process pursuant to the statutory requirements for working with states, some states disagreed with EPA’s final designations relative to the states’ own recommendations.

## **1997 PM<sub>2.5</sub> Area Designations Timeline**

By the end of February 2004, 18 states and the District of Columbia had recommended 142 counties as potential nonattainment areas for the 1997 PM<sub>2.5</sub> NAAQS.<sup>44</sup> After reviewing the state recommendations, EPA proposed modifications

---

<sup>42</sup> A map showing the final designation areas for PM<sub>2.5</sub> and for the eight-hour ozone NAAQS is available on EPA’s website at [<http://www.epa.gov/oar/oaqps/greenbk/mappm25o3.html>].

<sup>43</sup> As defined by the Office of Management Budget. For more information on metropolitan areas, see [<http://www.census.gov/population/www/estimates/aboutmetro.html>].

<sup>44</sup> For EPA’s final and proposed PM<sub>2.5</sub> geographical designation recommendations and those from individual states and tribes, see [<http://www.epa.gov/pmdesignations>].

resulting in nonattainment designations for 244 counties<sup>45</sup> in 21 states and the District of Columbia at the end of June 2004. As required by statute, EPA notified each of the affected states regarding their specific modifications, providing them with the opportunity to submit new information and demonstrate why a proposed modification was inappropriate. Some states responding to EPA's proposal continued to support their original recommendations.

The EPA's final PM<sub>2.5</sub> designation rule, published on January 5, 2005 (70 *Federal Register* 944-1019), established the boundaries for areas designated as "nonattainment," "unclassifiable" (data not sufficient to make a determination regarding compliance), or "attainment/unclassifiable."<sup>46</sup> The EPA designated 47 areas, composed of 225 counties in 20 states and the District of Columbia, as nonattainment; 5 areas consisting of 7 counties as unclassifiable;<sup>47</sup> and the remaining counties in the United States as attainment/unclassifiable.

The EPA's designations reflected minor modifications to its June 2004 proposal. Primarily, 19 counties were removed from the list of nonattainment areas, and other counties were redefined by designating only specified locations ("partial") within the county as nonattainment. In some cases, when considering factors defined in its guidance in conjunction with the additional information provided by the states and tribes, EPA determined that only those portions of a county that contained the significant sources of emissions should be considered as contributing to the violations. In other cases, the agency determined that if emissions from a large identifiable source in a county contribute to the violations in a nearby area, the portion of the county where the source is located would be designated nonattainment, even if it is not contiguous with the remainder of the designated area. The boundaries for these "noncontiguous" portions are based on legally recognized government boundaries, such as townships, tax districts, and census blocks.

Some states and stakeholders continued to contend that several counties should not be designated nonattainment, particularly when taking into account 2004 PM<sub>2.5</sub> monitoring data. The EPA's final designations were based on monitoring data for the three-year period from 2001-2003. Monitoring data for 2004 were not available in time for EPA to meet its statutory deadline for PM<sub>2.5</sub> geographical area designations (see timeline and discussion later in this report). The final PM<sub>2.5</sub>

---

<sup>45</sup> Included seven cities: Baltimore, MD; St. Louis, MO; Alexandria, VA; Fairfax, VA; Falls Church, VA; Manassas, VA; and Manassas Park, VA.

<sup>46</sup> The EPA designates an area as attainment/unclassifiable if (1) monitored air quality data show that the area has not violated the standard during a three-year period or (2) there is not enough information to determine the air quality in the area. Despite the CAA, Section 107(d)(1)(A) definitions for "nonattainment," "attainment," and "unclassifiable," EPA does not apply the "attainment" nomenclature. It is generally the case that the agency has sufficient data to determine that an area is *not* in nonattainment, but the data are insufficient or incomplete to fully determine attainment.

<sup>47</sup> The EPA concluded that there was insufficient information to designate these areas as either nonattainment or attainment/unclassifiable. According to the January 2005 *Federal Register* Notice (70 *Federal Register* 65984), these areas had violating monitors for years 2000-2002 but incomplete data or other data issues for years 2001-2003.

designation rule, published on January 5, 2005, included provisions allowing states to submit no later than February 22, 2005, certified, quality-assured 2004 monitoring data that suggest a change in designation is appropriate for consideration (70 *Federal Register* 948). A nonattainment designation could be withdrawn if EPA agreed that the additional data warranted such a change.

On April 14, 2005, EPA published a final supplemental rule amending the agency's initial final designations published in January 2005 (70 *Federal Register* 19844). After reviewing 2002-2004 air quality monitoring data provided by several states, EPA determined that eight areas comprising 17 counties previously identified as not meeting the 1997 PM<sub>2.5</sub> NAAQS should be designated as "in attainment" (see **Table 1** below). The EPA also changed four of the five areas designated as "unclassifiable" to "attainment," based on 2002-2004 data. The EPA did not consider the modifications for these areas "re-designations" because the changes were made prior to the April 5, 2005, effective date of the initial designations.

**Table 1. Areas Previously Identified as Nonattainment for 1997 PM<sub>2.5</sub> NAAQS Designated as Attaining the Standards**

State	Area Name	County
Alabama	Columbus, GA-AL	Russell
California	San Diego, CA	San Diego
Georgia	Athens, GA Columbus, GA-AL	Clarke Muscogee
Indiana	Elkhart, IN	Elkhart St. Joseph
Kentucky	Lexington, KY	Fayette Mercer (partial)
Ohio	Toledo, OH Youngstown-Warren, OH-PA	Lucas Wood Columbiana Mahoning Trumbull
Pennsylvania	Youngstown-Warren, OH-PA	Mercer
West Virginia	Marion, WV	Marion Monongalia (partial) Harrison (partial)

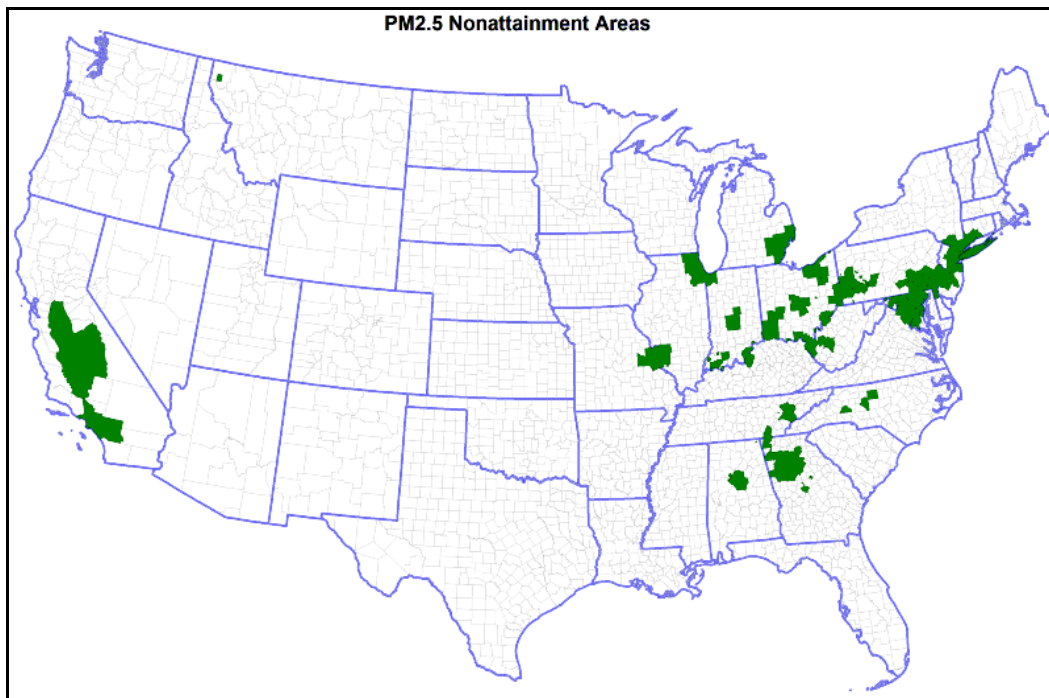
**Source:** U.S. Environmental Protection Agency, April 5, 2005. Available at [<http://www.epa.gov/pmdesignations/1997standards/regs.htm>].

In letters dated January 20, 2006, EPA denied six petitions submitted to the agency requesting reconsideration of the previous designations of one or more full or partial counties as nonattainment for the 1997 PM<sub>2.5</sub> NAAQS. The petitions were for counties in Georgia, Illinois, Michigan, Missouri, Ohio, and West Virginia.<sup>48</sup> In the August 25, 2008, *Federal Register*, EPA announced its determination that a

<sup>48</sup> For more information, see [<http://www.epa.gov/pmdesignations/1997standards/regs.htm>].

three-county (Harrisburg, Lebanon, Carlisle ) Pennsylvania nonattainment area for the 1997 PM<sub>2.5</sub> NAAQS was in attainment.<sup>49</sup> The determination was based on certified ambient air monitoring data showing that the area has monitored attainment of the 1997 PM<sub>2.5</sub> NAAQS since the 2004-2006 monitoring period. As of the end of August 2008, final nonattainment designations are in effect for 38 areas, comprising 205 counties within 20 states (and the District of Columbia) nationwide, with a combined population of almost 90 million. The EPA map in **Figure 1** highlights the PM<sub>2.5</sub> nonattainment designation areas.

**Figure 1. EPA Designations of Nonattainment Areas for the 1997 PM<sub>2.5</sub> National Ambient Air Quality Standards (NAAQS)**



**Source:** U.S. Environmental Protection Agency, available on EPA's website at [[http://www.epa.gov/oar/particlepollution/pdfs/20061025\\_graphsmaps.pdf](http://www.epa.gov/oar/particlepollution/pdfs/20061025_graphsmaps.pdf)]. Based primarily on 2001-2003 monitoring data, but 2002-2004 data was considered for a subset of states. Nonattainment areas on the above map include a three-county (Harrisburg, Lebanon, Carlisle ) area in Pennsylvania determined by EPA in August 2008 to be in attainment.

The designated nonattainment areas for the 1997 PM<sub>2.5</sub> NAAQS are primarily concentrated in the central, mid-Atlantic, and southeastern states east of the Mississippi River, as well as in California.<sup>50</sup> More than 2,900 counties in 30 states have been designated attainment/unclassifiable for the 1997 PM<sub>2.5</sub> NAAQS. Some public interest groups maintain that at least 150 additional counties warranted

<sup>49</sup> 73 *Federal Register* 49949, August 25, 2008.

<sup>50</sup> California has established its own PM<sub>2.5</sub> standards; for more information, see CRS Report RL31531 (archived), *Particulate Matter Air Quality Standards: Background and Current Developments*, by Robert Esworthy; or see the California Air Resources Board website at [<http://www.arb.ca.gov/pm/pmmeasures/pmmeasures.htm>].

nonattainment designations on the basis of emission sources in those areas.<sup>51</sup> Any area initially designated attainment/unclassifiable may be subsequently re-designated to nonattainment if ambient air quality data in future years indicate that such a re-designation is appropriate. Likewise, as was the case for EPA's determination regarding the three-county area in Pennsylvania, areas initially designated nonattainment may be determined to be attainment areas if more current certified monitoring data support the designation.

## **Demonstrating Attainment with the 1997 PM<sub>2.5</sub> NAAQS**

According to a January 2008 EPA report entitled, *Latest Findings on National Air Quality Status and Trends Through 2006*,<sup>52</sup> nationally, annual PM<sub>2.5</sub> concentrations declined by 14% between 2000 and 2006. Between 1990 and 2006, PM<sub>10</sub> concentrations declined by 30% nationally. For PM<sub>2.5</sub>, the areas that showed the greatest improvement were the ones that had the highest concentrations in earlier years, including Southern California and the industrial Midwest and the Northeast. The Southeast had little change in PM<sub>2.5</sub>.

Despite this progress, in 2006, nearly 67 million people lived in counties with measured concentrations exceeding the annual PM<sub>2.5</sub> national air quality standard (based on a one-year metric, not the three-year average).<sup>53</sup> A report released by the American Lung Association (ALA) in April 2007 indicated higher average concentration levels of year-round PM<sub>2.5</sub> in densely populated areas of the eastern United States during 2003-2005, compared with 2002-2004. The report noted that outside of the eastern United States, particle levels continued to drop during the same time period, even in areas that the ALA has historically ranked as high in particle pollution.<sup>54</sup> Achieving attainment of the 1997 PM<sub>2.5</sub> NAAQS is expected to further reduce exposure to fine particulate matter; overall, EPA estimated that attainment of the 1997 PM<sub>2.5</sub> NAAQS would annually result in the avoidance of at least 3,300 to 15,600 incidences of premature mortality nationwide.<sup>55</sup>

<sup>51</sup> American Lung Association, "No One Should Have to Breathe Unsafe Air," December 17, 2004; press release available at [<http://www.lungusa.org/site/c.dvLUK9O0E/b.4061173/apps/s/content.asp?ct=323661>].

<sup>52</sup> EPA-454/R-07-007, January 2008 [<http://www.epa.gov/air/airtrends/2007/>].

<sup>53</sup> Refers to trends in the measured PM<sub>2.5</sub> concentrations relative to their air quality standards in those areas where monitors are located across the country, and does not reflect all designated nonattainment areas. The combined population residing in EPA's final PM<sub>2.5</sub> nonattainment designation areas, consisting of 205 counties in 20 states and the District of Columbia, is almost 90 million.

<sup>54</sup> Estimates are based on air quality data obtained from the U.S. Environmental Protection Agency's Air Quality System (AQS), formerly called Aerometric Information Retrieval System (AIRS). American Lung Association, *State of the Air: 2007*, released April 2007, [<http://lungaction.org/reports/stateoftheair2007.html>].

<sup>55</sup> EPA, *Regulatory Impact Analysis for the Particulate Matter and Ozone National Ambient* (continued...)

## The State Implementation Plan (SIP)

Following the designation of an area as nonattainment, the state where the area is located must develop a State Implementation Plan (SIP) that demonstrates how attainment with the PM<sub>2.5</sub> standards will be achieved. Under Section 110 of the CAA, states must submit their SIPs to EPA within three years of designation; 1997 PM<sub>2.5</sub> NAAQS SIPs were due April 5, 2008. To be approved, a SIP must demonstrate that the area will reach attainment of the standards by a specified deadline — 2010 for 1997 PM<sub>2.5</sub> NAAQS unless an extension allowed under the CAA is granted.<sup>56</sup>

SIPs include pollution control measures that will be implemented by federal, state, and local governments, and rely on models of the impact on air quality of projected emission reductions to demonstrate attainment. According to EPA, nine of the 57 SIPs (there are 38 areas, but some have multiple states submitting individual SIPs) had been submitted as of the end of August 2008.<sup>57</sup> States with nonattainment areas must be in compliance with the 1997 PM<sub>2.5</sub> NAAQS by April 5, 2010, unless they are granted an extension.

### EPA's PM<sub>2.5</sub> Implementation Rule

On April 25, 2007, EPA published its final rule<sup>58</sup> that describes the requirements that states and tribes must meet in their implementation plans to achieve and maintain attainment of the 1997 PM<sub>2.5</sub> NAAQS.<sup>59</sup> In addition to detailing provisions necessary to demonstrate how the PM<sub>2.5</sub> NAAQS will be attained, the implementation rule includes guidance for submitting a SIP demonstrating that reaching attainment within the five-year requirement is impractical. A number of provisions that generated

---

<sup>55</sup> (...continued)

*Air Quality Standards and Proposed Regional Haze Rule*, July 1997, p. ES-18. Available at [<http://www.epa.gov/ttn/oarpg/naaqsfm/ria.html>], also see CRS Report RL31531 (archived), *Particulate Matter Air Quality Standards: Background and Current Developments*, by Robert Esworthy, for more detail discussion of EPA's review and findings regarding the scientific health effects data in support of the 1997 PM<sub>2.5</sub> NAAQS.

<sup>56</sup> Under section 172(a)(2)(A) of the CAA, EPA may grant an area an extension of the initial attainment date for one to five years (in no case later than 10 years after the designation date for the area). A state requesting an extension must submit an implementation plan (SIP) by the required deadline that includes, among other things, sufficient information demonstrating that attainment by the initial attainment date is "impracticable."

<sup>57</sup> Information provided directly to CRS by the EPA Office of Air Quality Planning and Standards (OAQPS) based on consultation with the EPA Regions.

<sup>58</sup> *72 Federal Register* 20586-20667, April 25, 2007.

<sup>59</sup> The rule addresses attainment demonstration and modeling; local emission reduction measures, including reasonably available control technology (RACT), reasonably available control measures (RACM), and reasonable further progress (RFP); regional emission reduction strategies; innovative program guidance; emission inventory requirements; transportation conformity; and stationary source test methods.



several comments during the proposal have been retained in the final rule,<sup>60</sup> and continue to be the topic of debate. As noted earlier, petitions for legal review of EPA's implementation rule have been filed with the U.S. Court of Appeals for the D.C. Circuit, and two petitions for reconsideration have been filed with EPA.

## Transportation Conformity

If new or revised SIPs for PM<sub>2.5</sub> attainment establish or revise a transportation-related emissions budget, or add or delete transportation control measures (TCMs), they trigger "conformity" determinations. Transportation conformity is required by the CAA, Section 176(c) (42 U.S.C. 7506(c)), to prohibit federal funding and approval for highway and transit projects unless they are consistent with ("conform to") the air quality goals established by a SIP and will not cause new air quality violations, worsen existing violations, or delay timely attainment of the national ambient air quality standards. Conformity becomes applicable within one year of the effective date of designating an area as nonattainment. EPA has promulgated several transportation conformity rules and rule amendments since its enactment as part of the 1990 CAA.<sup>61</sup> The rules generally establish the criteria and procedures for determining whether transportation plans, transportation improvement programs (TIPs), or projects conform to a state's SIP.

On July 1, 2004, EPA published a final rule<sup>62</sup> making transportation conformity regulations applicable explicitly to PM<sub>2.5</sub> nonattainment areas and included criteria and procedures for the new PM<sub>2.5</sub> and eight-hour ozone NAAQS. On May 6, 2005, EPA published a final rule<sup>63</sup> further amending the transportation conformity regulations by adding transportation-related PM<sub>2.5</sub> "precursors" and specifying when these precursors must be considered in conformity determinations before and after PM<sub>2.5</sub> SIPs are submitted.<sup>64</sup> The EPA established the criteria for determining which

---

<sup>60</sup> Each section of the final April 25, 2007, PM<sub>2.5</sub> implementation rule (72 *Federal Register* 20586-20667) summarizes policies and options discussed in the proposed rule, and provides responses to the major comments received on each issue. Comments and other supporting materials are available the docket established for this rule (ID-HQ-OAR-2003-0062) electronically at [<http://www.regulations.gov>] or in hard copy at the EPA Docket Center.

<sup>61</sup> The initial conformity rule was promulgated by EPA on November 24, 1993 (58 *Federal Register* 62188), and has subsequently been amended several times; see EPA's "Chronological List of Transportation Conformity Rulemakings" at [<http://www.epa.gov/otaq/stateresources/transconf/conf-regs-c.htm>], and "Transportation Conformity Regulations Current as of January 2008," EPA420-B-08-001, January 2008, [<http://www.epa.gov/otaq/stateresources/transconf/regs/420b08001.pdf>].

<sup>62</sup> 69 *Federal Register* 40004, July 1, 2004. See also *Companion Guidance for the July 1, 2004, Final Transportation Conformity Rule: Conformity Implementation in Multi-Jurisdictional Nonattainment and Maintenance Areas for Existing and New Air Quality Standards*, EPA, July 2004, EPA420-B-04-012, Transportation and Regional Programs Division, Office of Transportation and Air Quality, available at [<http://www.epa.gov/otaq/stateresources/transconf/policy.htm>].

<sup>63</sup> 70 *Federal Register* 24280, May 6, 2005.

<sup>64</sup> Precursors are pollutants that react chemically in the atmosphere to form other pollutants.

(continued...)

transportation projects must be analyzed for local particle emissions (referred to as “hot spots”<sup>65</sup>) in PM<sub>2.5</sub> nonattainment and maintenance areas, and revised existing requirements for projects in PM<sub>10</sub> areas, in a final rule published on March 10, 2006.<sup>66</sup> Although petitioners challenged certain provisions of the July 2004 and March 2006 final rules with varying results,<sup>67</sup> all PM<sub>2.5</sub> nonattainment areas have completed their initial transportation conformity determinations, and as a result their transportation plans and programs conformed to the 1997 PM<sub>2.5</sub> NAAQS according to EPA.<sup>68</sup>

## Upwind Pollutant Contributions: § 126 of the CAA

Whether any special consideration can be given to areas whose air quality is adversely affected by pollution from upwind areas is one of the more frequently raised issues in nonattainment areas. Unlike the larger coarse particles, which generally settle more rapidly and fall near their source of emission, the smaller PM<sub>2.5</sub> particles frequently remain in the atmosphere longer and can travel significant distances from their original source. The transport of PM<sub>2.5</sub> can contribute to, and in some cases can be the primary cause of, nonattainment in areas downwind of an emission source.

Subpart 1 of the CAA allows EPA to “classify the area for the purpose of applying an attainment date” and to consider such factors as “the availability and feasibility of pollution control measures.” As referenced in the proposed PM<sub>2.5</sub> implementation rule, areas also may petition the agency under § 126 of the CAA to impose controls on upwind sources that significantly contribute to their nonattainment of the standard. The May 2005 promulgation of CAIR<sup>69</sup> was expected to address the interstate transport of pollutants (SO<sub>2</sub> and NO<sub>x</sub>) from electric generating units (EGUs) hindering downwind states from attaining the eight-hour

---

<sup>64</sup> (...continued)

The transportation-related PM<sub>2.5</sub> precursors identified in the May 2005 rule are nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOCs), sulfur oxides (SO<sub>2</sub>), and ammonia (NH<sub>3</sub>). See [<http://www.epa.gov/otaq/stateresources/index.htm>].

<sup>65</sup> The CAA defines “hot-spot analysis” as an estimation of likely future localized pollutant concentrations resulting from a new transportation project and a comparison of those concentrations to the relevant air quality standard (40 CFR 93.101).

<sup>66</sup> 71 *Federal Register* 12468, March 10, 2006.

<sup>67</sup> For findings by the U.S. Court of Appeals for the D.C. Circuit, see *Environmental Defense v. EPA*, No. 04-1291 (D.C. Cir. October 20, 2006), and *Natural Resources Defense Council, Environmental Defense, and Sierra Club v. EPA*, No. 06-1164 (D.C. Cir. December 2006).

<sup>68</sup> Information provided to CRS by EPA’s Office of Air Quality and Planning, April 17, 2008.

<sup>69</sup> Environmental Protection Agency, *Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule); Revisions to Acid Rain Program; Revisions to the NO<sub>x</sub> SIP Call; Final Rule* (70 *Federal Register* 25162-25405, May 12, 2005), p. 25246.

ozone and 1997 PM<sub>2.5</sub> NAAQS.<sup>70</sup> However, the D.C. Circuit Court's decision<sup>71</sup> to vacate CAIR puts the focus back on § 126 petitions as the available means to address interstate transport of air pollutants in the immediate future.<sup>72</sup>

EPA has never granted a § 126 petition in the manner outlined by the statute.<sup>73</sup> Most recently, it denied a 2004 § 126 petition from the State of North Carolina for several reasons, in part arguing that CAIR was a better mechanism for addressing the interstate transport of pollution to which North Carolina was subject than was the state's petition under § 126. North Carolina challenged this denial in court. Its challenge was stayed, pending the outcome of the CAIR lawsuit, of which North Carolina was a petitioner. (See additional discussion later in this report under "D.C. Circuit's Decision Vacating CAIR.")

## Grant Programs

Although EPA does not have a grant program specifically designed to assist nonattainment areas, the agency generally provides grants to state air pollution agencies in support of their programs. Other sources of funding are also available. For example, states may obtain funding for projects intended to contribute to the attainment or maintenance of NAAQS under the Department of Transportation's (DOT's) Congestion Mitigation and Air Quality Improvement Program (CMAQ). Congress authorized \$8.6 billion for this program for FY2005-FY2009 under the Safe, Accountable, Flexible and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) (P.L. 109-59), signed into law on August 10, 2005.

Authorized initially by Congress under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA, P.L. 102-240) and funded by the Highway Trust Fund, CMAQ provides funding for surface transportation and other related projects that contribute to air quality improvements and congestion mitigation. In particular, the program is authorized to fund projects that contribute to the reduction of carbon monoxide (CO) and ozone concentrations. CMAQ funds are apportioned to a state

---

<sup>70</sup> Sulfur dioxide (SO<sub>2</sub>) is a precursor contributing to the formation of PM<sub>2.5</sub> concentrations, and NO<sub>x</sub> is a precursor (a pollutant that is transformed in air to form another air pollutant) contributing to the formation of both ozone and PM<sub>2.5</sub> concentrations. EPA has concluded that SO<sub>2</sub> and NO<sub>x</sub> emissions, through the phenomenon of air pollution transport, contribute significantly to downwind nonattainment, or interfere with maintenance, of the PM<sub>2.5</sub> and eight-hour ozone NAAQS. 70 *Federal Register* 25162, May 12, 2005.

<sup>71</sup> 531 F.3d 896 (D.C. Cir. 2008).

<sup>72</sup> For a more detailed discussion of the court's decision and its implications, see CRS Report RL34589, *Clean Air After the CAIR Decision: Back to Square One?*, by James E. McCarthy, Larry Parker, and Robert Meltz.

<sup>73</sup> Petitions regarding NAAQS other than PM<sub>2.5</sub> have been filed with the agency; the most well-known are those that were filed in August 1997 by eight northeastern states, four of which were granted by the agency in January 2000. See CRS Report 98-236, *Air Quality: EPA's Ozone Transport Rule, OTAG, and Section 126 Petitions — A Hazy Situation?*, by Larry Parker and John Blodgett (available from the authors).

based on its population and pollution reduction needs.<sup>74</sup> States with no maintenance or nonattainment areas for ozone or CO are guaranteed a minimum of 0.5% of each fiscal year's authorized CMAQ funds.

CMAQ was expanded to allow the use of funds for projects intended to reduce particulate concentrations under the Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21, P.L. 105-178). TEA-21 did not, however, change the apportionment formula that is based on CO and ozone. States with maintenance or nonattainment areas for *only* particulates receive the guaranteed minimum.<sup>75</sup>

## Recent Actions and Their Implications for Achieving Attainment of the 1997 PM<sub>2.5</sub> NAAQS

A number of events, most notably the D.C. Circuit Court's decision regarding the Clean Air Interstate Rule (CAIR), EPA's final 2006 revisions of the PM NAAQS, and actions regarding implementation of the agency's eight-hour ozone NAAQS, are directly affecting the timely implementation of the 1997 PM<sub>2.5</sub> NAAQS. The D.C. Circuit's decision to vacate CAIR, in particular, could result in significantly delays, but each of these issues has garnered attention in Congress.

### D.C. Circuit's Decision Vacating the Clean Air Interstate Rule (CAIR)<sup>76</sup>

The EPA's Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone, or the Clean Air Interstate Rule (CAIR), published in May 2005, was expected to address the interstate transport of pollutants (SO<sub>2</sub> and NO<sub>x</sub>) from electric generating units (EGUs) hindering downwind states from attaining the eight-hour ozone and 1997 PM<sub>2.5</sub> NAAQS.<sup>77</sup> On July 11, 2008, the U.S. Court of Appeals for

---

<sup>74</sup> For the FY2008 apportionment of CMAQ funds, see the U.S. Department of Transportation Federal Highway Administration Notice: Revised Apportionment of Fiscal Year (FY) 2008 Congestion Mitigation & Air Quality Improvement Program Funds, January 30, 2008, [<http://www.fhwa.dot.gov/legregs/directives/notices/n4510667.htm>]; for prior years, see [<http://www.fhwa.dot.gov/legregs/directives/notices.htm>].

<sup>75</sup> For a more detailed discussion of CMAQ and relevant legislation, see CRS Report RL33119, *Safe, Accountable, Flexible, Efficient Transportation Equity Act — A Legacy for Users (SAFETEA-LU or SAFETEA): Selected Major Provisions*, by John W. Fischer; and CRS Report RL33057 *Surface Transportation Reauthorization: Environmental Issues and Legislative Provisions in SAFETEA-LU (H.R. 3)*, by Linda Luther.

<sup>76</sup> For a more detailed discussion of the court's decision and its implications, see CRS Report RL34589, *Clean Air After the CAIR Decision: Back to Square One?*, by James E. McCarthy, Larry Parker and Robert Meltz.

<sup>77</sup> Sulfur dioxide (SO<sub>2</sub>) is a precursor contributing to the formation of PM<sub>2.5</sub> concentrations, and NO<sub>x</sub> is a precursor (a pollutant that is transformed in air to form another air pollutant) contributing to the formation of both ozone and PM<sub>2.5</sub> concentrations. EPA has concluded that SO<sub>2</sub> and NO<sub>x</sub> emissions, through the phenomenon of air pollution transport, contribute  
(continued...)

the D.C. Circuit issued its decision vacating CAIR,<sup>78</sup> though the decision will not take effect until further developments in the court have occurred.

Although CAIR generally had broad support among environmentalists and many in the regulated community, no less than 32 petitions<sup>79</sup> for review of CAIR were consolidated and decided in *North Carolina v. EPA*. Some, including the State of North Carolina,<sup>80</sup> argued that the rule was not strong enough to address pollution from upwind sources. Others, mostly individual utilities, contended that the rule's emission budgets would disproportionately affect certain operations and facilities. The D.C. Circuit found several of the key challenges valid, but decided against voiding only the successfully challenged portions. Noting that EPA regards CAIR as one integrated action, the court's decision would vacate the entire rule (and its associated Federal Implementation Plan) and remand it to EPA.

In developing CAIR, with respect to the 1997 PM<sub>2.5</sub> NAAQS, EPA modeled the emissions impacts of 37 eastern states on 62 eastern downwind counties projected by EPA to be in nonattainment in 2010.<sup>81</sup> EPA found 23 states and the District of Columbia were projected to contribute significantly to 2010 PM<sub>2.5</sub> nonattainment. These states and the District constitute the region covered under CAIR's annual NOx and SO<sub>2</sub> caps. Based on air quality analyses in support of the CAIR, EPA predicted that 17 of 36 areas in the eastern United States designated as nonattainment (out of compliance) with the 1997 PM<sub>2.5</sub> NAAQS would reach attainment by 2010 as a result of implementing CAIR in conjunction with other existing national programs.<sup>82</sup> On the other hand, the EPA analyses recognized that as many as 19 of the areas would remain in nonattainment, highlighting the importance of local and state emission reduction efforts. The extent of pollution reduction projected to result from implementing CAIR had been the subject of considerable debate among stakeholders and some Members of Congress for some time prior to the July 2008 D.C. Circuit decision to vacate the rule.<sup>83</sup>

---

<sup>77</sup> (...continued)

significantly to downwind nonattainment, or interfere with maintenance, of the PM<sub>2.5</sub> and eight-hour ozone NAAQS. 70 *Federal Register* 25162, May 12, 2005.

<sup>78</sup> 531 F.3d 896 (D.C. Cir. 2008).

<sup>79</sup> EPA's CAIR "Regulatory Actions" website, at [<http://www.epa.gov/cair/rule.html>], presents overviews of these challenges and the agency's responses chronologically. The complete petitions are available in the docket for the CAIR, Docket ID No. EPA-HQ-OAR-2003-0053, at [<http://www.regulations.gov>].

<sup>80</sup> Prior to the publication of the final CAIR rule, North Carolina filed a petition in March 2004 under Section 126 of the federal CAA, which allows states to seek federal intervention on transboundary air pollution. The petition, settlement (*North Carolina v. Johnson*, No. 5:05-CV-112-BR(3), February 17, 2005, E.D.N.C.), and subsequent actions regarding this petition can also be found in the CAIR Docket.

<sup>81</sup> *Clean Air Interstate Rule*, p. 25247.

<sup>82</sup> See page 66006 of 70 *Federal Register* 65984, November 1, 2005, *Proposed Rule to Implement the Fine Particle National Ambient Air Quality Standards*.

<sup>83</sup> For more information on the CAIR, see CRS Report RL32927, *Clean Air Interstate Rule*: (continued...)

Under EPA's implementation guidance for the SIPs outlining states' strategies for complying with the 1997 PM<sub>2.5</sub> NAAQS, carrying out the CAIR would have met the interstate transport (downwind state) provision of § 110(a)(2)(D) of the CAA. As litigation regarding certain aspects of CAIR was pending, EPA reported that its implementation was continuing.<sup>84</sup> According to EPA, all the states covered under CAIR chose to participate in the trading programs for SO<sub>2</sub> and NO<sub>x</sub> (or acknowledged an EPA Federal Implementation Plan (FIP) as a default); some also have established direct control programs complementing the trading programs. States had been working to put implementing rules in place, and some in the regulated community had been going forward with investing in equipment for CAIR.

The court's decision regarding CAIR presents a major setback to the implementation of the 1997 PM<sub>2.5</sub> (and ozone) NAAQS. EPA's Director of Atmospheric Programs testified before Congress that

[i]n many cases, states in the CAIR region have relied heavily on the emission reductions required by CAIR as they conducted their modeling to show that they will meet the 1997 ambient air quality standards on time. These attainment demonstration components of the SIPs will likely need to be revised to show how the states will achieve the emission reductions previously required by CAIR.<sup>85</sup>

The vacating of CAIR means that SIPs from downwind states may be inadequate because they assumed the CAIR reductions in interstate transport of pollutants. SIPs from upwind states, on the other hand, could be inadequate if they do not prevent downwind nonattainment: the CAA makes clear that states are to impose controls on stationary sources of pollution that contribute significantly to downwind nonattainment or interfere with the maintenance of air quality standards in other states (§ 110(a)(2)(D)). This provision of the statute has been widely disregarded in the past, with little EPA effort (other than regional cap-and-trade programs) to address it. This reluctance to act can be challenged through CAA § 126 petitions, and the court's decision puts the focus on these petitions as the available means of addressing interstate transport of air pollutants in the immediate future.

As discussed previously, EPA has never granted a § 126 petition in the manner outlined by the statute. On August 8, 2008, the State of North Carolina petitioned the D.C. Circuit to resume its 2007 lawsuit challenging EPA's denial of its 2004 § 126 petition. EPA had denied the earlier petition primarily based on the outcomes provided by CAIR. The lawsuit had been placed on hold by the D.C. Circuit pending its decision regarding challenges to CAIR. A decision in North Carolina's favor

---

<sup>83</sup> (...continued)

*Review and Analysis*, by Larry Parker, and CRS Report RL32273, *Air Quality: EPA's Proposed Interstate Air Quality Rule*, by Larry Parker and John Blodgett.

<sup>84</sup> *Acid Rain and Related Programs: 2006 PROGRESS REPORT*, EPA-430-R-07-011, November 2007, [<http://www.epa.gov/airmarkets/progress/docs/2006-ARP-Report.pdf>].

<sup>85</sup> Testimony of Mr. Brian McLean, Director of Atmospheric Programs, Office of Air and Radiation, U.S. EPA, before the Senate Committee on Environment and Public Works, Subcommittee on Clean Air and Nuclear Safety, July 29, 2008, [<http://epw.senate.gov/public/>].

would seem much more likely, as the D.C. Circuit decision in the CAIR case notes that “downwind states retain their statutory right to petition for immediate relief from unlawful interstate pollution under section 126.”<sup>86</sup> A court finding in favor of North Carolina’s § 126 petition might, therefore, bring on numerous § 126 petitions from other states. On August 11, 2008, EPA and interveners motioned the D.C. Circuit to hold in abeyance the case regarding the denial of North Carolina’s § 126 petition.

On September 24, 2008, EPA requested reconsideration of the court’s July 2008 decision, with suggestion for rehearing en banc (that is, a rehearing by the entire court), as did the Natural Resources Defense Council (NRDC), the National Mining Association, and the Utility Air Regulatory Group, in separate petitions. Granting reconsideration or a rehearing en banc is unusual, and success is especially unlikely given that the initial *North Carolina v. EPA* decision was unanimous and appeared to give the court little pause. Granting a rehearing requires the vote of a majority of the active duty judges on the D.C. Circuit.

Deadlines are fast approaching for states in nonattainment to submit SIPs and reach attainment of the 1997 PM<sub>2.5</sub> (and ozone) NAAQS. It is also unclear whether the agency can salvage the regional cap-and-trade approach, which lies at the heart of CAIR, or if cap-and-trade on a smaller scale, whether intrastate or intra-company, would face better odds.<sup>87</sup> The court found “more than several fatal flaws”<sup>88</sup> in the rule, and concluded, “No amount of tinkering will transform CAIR, as written, into an acceptable rule.”<sup>89</sup> This raises the question of whether Congress might intervene (see discussion under “Congressional Action Related to Particulates NAAQS Implementation,” later in this report).

## **Completion of EPA’s Most Recent Review of the Particulates NAAQS and the September 2006 Changes<sup>90</sup>**

At the end of 2005, EPA completed its statutorily required<sup>91</sup> review and assessment of relevant scientific studies to either reaffirm or modify the particulates NAAQS. Based on the review, on October 17, 2006, EPA promulgated revisions to

---

<sup>86</sup> 531 F.3d at 930 (D.C. Cir. 2008)

<sup>87</sup> Allowing even modest emissions trading can significantly reduce costs. Estimates made during the development of the acid rain trading program indicated that intra-utility trading reduced costs by half over a plant-by-plant control program, while including intrastate trading reduced costs by an additional 10%. Further expansion to interstate trading reduced costs an additional 10%. See Larry B. Parker, Robert D. Poling, and John L. Moore, “Clean Air Act Allowance Trading,” 21 *Environmental Law*, 2021, 2022-2068 (1991).

<sup>88</sup> 531 F.3d at 901 (D.C. Cir. 2008).

<sup>89</sup> 531 F.3d at 930 (D.C. Cir. 2008).

<sup>90</sup> For more information regarding of EPA’s changes to the particulates NAAQS, see CRS Report RL33254, *Air Quality: EPA’s 2006 Changes to the Particulate Matter (PM) Standard*, by Robert Esworthy and James E. McCarthy. Information can also be accessed on EPA’s website at [[http://www.epa.gov/ttn/naaqs/standards/pm/s\\_pm\\_index.html](http://www.epa.gov/ttn/naaqs/standards/pm/s_pm_index.html)].

<sup>91</sup> Section 109(d)(1) of the CAA.

the particulates NAAQS.<sup>92</sup> Given the simultaneity of these 2006 revised particulates NAAQS and the ongoing implementation of the 1997 PM<sub>2.5</sub> standards, outcomes and challenges associated with the review and EPA's changes to the existing (1987 and 1997) NAAQS for PM<sub>10</sub> and PM<sub>2.5</sub> could affect the current implementation schedule.

Based on its review and analysis of scientific studies available between 1997 and 2002,<sup>93</sup> and determinations made by the Administrator, EPA's modifications to the particulates NAAQS tightened the current NAAQS primarily by strengthening the daily (24-hour) standard for PM<sub>2.5</sub>. The 2006 revised NAAQS lowered the daily PM<sub>2.5</sub> standard from 65 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) to 35  $\mu\text{g}/\text{m}^3$  and retained the annual standard at 15  $\mu\text{g}/\text{m}^3$ . The EPA left the existing (1987) daily standard for coarse particles (PM<sub>10</sub>) in place at 150  $\mu\text{g}/\text{m}^3$  and relaxed the standard somewhat by revoking the existing annual maximum concentration standard of 50  $\mu\text{g}/\text{m}^3$ .

The tightening of the PM<sub>2.5</sub> NAAQS will result in the classification of more areas as "nonattainment" and in need of implementing new controls on particulate matter. States and local governments would be required to develop and implement new plans (SIPs) for addressing emissions in those areas that do not meet any new standards. In a February 2006 advanced notice of proposed rulemaking (ANPR)<sup>94</sup> outlining an implementation plan for the transition to the 2006 particulates standards, EPA indicated that it would be beneficial for states to consider control strategies that may be useful in attaining the 2006 revised PM<sub>2.5</sub> NAAQS when developing their strategies for the 1997 PM<sub>2.5</sub> standards.

In December 2007, states provided EPA with recommended nonattainment boundaries for the 2006 revised particulates NAAQS based on 2004-2006 monitoring data. EPA responded to the states with the agency's intended designations of areas not in attainment with the 2006 PM<sub>2.5</sub> NAAQS in letters dated August 19, 2008, and solicited the states' comments and additional information for consideration in determining the final designations.<sup>95</sup> The agency identified 169 counties and portions of 46 additional counties for designation as nonattainment. States (and tribal groups) have 120 days to respond to EPA's recommendations, and the agency has also issued a notice<sup>96</sup> for a 30-day public comment period. EPA expects to finalize these nonattainment designations (based on 2005-2007 monitoring data) by the end of 2008, with an effective date of April 2009. The associated impacts on specific geographical nonattainment areas would be speculative at best, because

---

<sup>92</sup> 71 *Federal Register* 61143-61233, October 17, 2006.

<sup>93</sup> EPA, *Air Quality Criteria for Particulate Matter*, October 29, 2004. EPA, *Review of the National Ambient Air Quality Standards for Particulate Matter: Policy Assessment of Scientific and Technical Information, OAQPS Staff Paper*, Office of Air Quality Planning and Standards, EPA-452/R-05-005, July 2005. The EPA criteria document and staff paper can be available at [[http://www.epa.gov/ttn/naaqs/standards/pm/s\\_pm\\_2006\\_sp.html](http://www.epa.gov/ttn/naaqs/standards/pm/s_pm_2006_sp.html)].

<sup>94</sup> 71 *Federal Register* 6718, February 9, 2006.

<sup>95</sup> For information regarding EPA's proposed designations, including correspondence between EPA and state and tribal representatives, see [<http://www.epa.gov/pmdesignations/2006standards/regs.htm#2>].

<sup>96</sup> 73 *Federal Register* 51257, September 2, 2008.



implementation of the 2006 revised particulates NAAQS is several years off. States will not be required to submit SIPs until 2013, and would not have to meet the new PM<sub>2.5</sub> standard until April 2014 (or April 2020, if qualified for an extension<sup>97</sup>). For the 1997 PM<sub>2.5</sub> NAAQS, states were required to submit implementation plans for how they will meet the standards by April 2008, and must be in compliance by 2010, unless granted an extension.<sup>98</sup>

In December 2006, several states and industry, agriculture, business, and public advocacy groups separately petitioned the court to review the 2006 revised particulates NAAQS.<sup>99</sup> These challenges could affect the current implementation schedule for the 1997 PM<sub>2.5</sub> NAAQS. The EPA's previous review and 1997 establishment of particulates (and ozone) standards were the subject of litigation and challenges, including a Supreme Court decision in 2001.<sup>100</sup> (See discussion below in "Implementation of the 1997 PM<sub>2.5</sub> NAAQS: Timeline and Delays.") The final form of the 2006 revised particulates NAAQS, and the associated potential impacts of implementation of the 1997 PM<sub>2.5</sub> standards, may not be known for some time.

## **Congressional Action Related to Particulates NAAQS Implementation**

Concerns regarding the potential impacts of the ozone and particulate standards have led to several attempts by Congress over the years to modify the implementation requirements.<sup>101</sup> Attempts in recent years were generally attached to larger pieces of legislation, such as the energy<sup>102</sup> and transportation bills, as well the proposed multi-pollutant (Clear Skies) bills to reduce emissions from coal-fired power plants.

---

<sup>97</sup> Under § 172(a)(2)(A) of the CAA, EPA may grant an area an extension of the initial attainment date for one to five years (not later than 10 years after the designation date for the area). A state requesting an extension must submit an implementation plan (SIP) by the required deadline that includes, among other things, sufficient information demonstrating that attainment by the initial attainment date is "impracticable."

<sup>98</sup> *Ibid.*

<sup>99</sup> The Court consolidated the cases at *American Farm Bureau Federation v. U.S. EPA*, No. 06-1410 (D.C. Cir. 2006).

<sup>100</sup> *American Trucking Associations v. EPA*, 175 F.3d 1027, 1055-56 (D.C. Cir. 1999), rehearing granted in part and denied in part, 195 F.3d 4 (D.C. Cir. 1999), affirmed in part and reversed in part, *Whitman v. American Trucking Associations*, 531 U.S. 457 (2001). In March 2002, the court of appeals rejected all remaining challenges to the standards, *American Trucking Associations v. EPA*, 283 F. 3d 355, 369-72 (D.C. Cir. 2002).

<sup>101</sup> For a historical perspective, see CRS Report RL34057, *Ozone Air Quality Standards: EPA's 2007 Proposed Changes*, by James E. McCarthy; and CRS Report RL33552, *Clean Air Act Issues in the 109<sup>th</sup> Congress*, by James E. McCarthy.

<sup>102</sup> See CRS Report RL32873, *Key Environmental Issues in the Energy Policy Act of 2005 (P.L. 109-58, H.R. 6)*, by Brent D. Yacobucci.

Although PM<sub>2.5</sub> was not one of the primary pollutants<sup>103</sup> specified in the multi-pollutant legislation previously considered, certain provisions of some of the bills could have potentially contributed to reducing PM<sub>2.5</sub> concentrations.<sup>104</sup>

The D.C. Circuit's decision vacating CAIR puts into play again the issue of a multi-pollutant strategy with respect to the electric utility industry — a framework based on a consistent set of emissions caps implemented through emission trading. Such an approach would not resolve all the issues surrounding CAIR, and would raise issues of its own:<sup>105</sup>

- Should multi-pollutant legislation supplement or be a substitute for the current regulatory regime?
- How stringent should the emission caps be?
- What is an appropriate schedule for their introduction?
- How should they relate to existing CAA provisions?
- Should carbon dioxide be included with SO<sub>2</sub>, NO<sub>x</sub>, and mercury control programs?
- Should requirements be limited to the electric utility industry?
- Should EPA be provided with the authority to implement CAIR or other cost-based, market-oriented approaches to address NAAQS?
- Should there be comprehensive revision to the CAA to address the full scope of ozone and PM<sub>2.5</sub> NAAQS nonattainment and related issues, as well as other pollutant emissions from coal-fired powerplants, and emerging environmental issues such as climate change?

Congress could consider a more surgical legislative vehicle aimed specifically at providing EPA with the authority to implement CAIR or other cost-based, market-oriented approaches to address NAAQS. At the other extreme, Congress might consider a more comprehensive revision to the CAA to address not only ozone and PM<sub>2.5</sub> NAAQS nonattainment, but also mercury emissions from coal-fired powerplants, and emerging environmental issues such as climate change.

---

<sup>103</sup> Bills introduced in previous Congresses generally focused on regulating three or four pollutants; three-pollutant bills addressed sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and mercury (Hg) emissions, and the four-pollutant bills added carbon dioxide (CO<sub>2</sub>)

<sup>104</sup> During the 110<sup>th</sup> Congress, five multi-pollutant bills have been introduced. The proposed bills, S. 1168, S. 1177, S. 1201, S. 1554, and H.R. 3989, would establish a regulatory program to reduce the quantities of sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), mercury (Hg), and carbon dioxide (CO<sub>2</sub>) emissions from the electric generating sector. No action has been scheduled as of this writing. For information and a comparison of legislative proposals, see CRS Report RL34018, *Air Quality: Multi-Pollutant Legislation in the 110<sup>th</sup> Congress*, by Larry Parker and John Blodgett. For a comparison of bills in the 109<sup>th</sup> Congress, including the Clear Skies bill, see CRS Report RL32755, *Air Quality: Multi-Pollutant Legislation in the 109<sup>th</sup> Congress*, by Larry Parker and John Blodgett.

<sup>105</sup> See CRS Report RL34589, *Clean Air After the CAIR Decision: Back to Square One?*, by James E. McCarthy, Larry Parker and Robert Meltz.

These questions and related issues were at the center of discussion during the July 29, 2008, hearing held by the Senate Committee on Environment and Public Works's Subcommittee on Clean Air and Nuclear Safety.<sup>106</sup>

## Conclusion

Implementation of the 1997 PM<sub>2.5</sub> NAAQS is affecting a number of counties throughout the U.S., including some that were not previously designated “nonattainment” for a NAAQS. Nonattainment designations are in effect for 38 areas, comprising 205 counties within 20 states (and the District of Columbia) nationwide, with a combined population of almost 90 million. A number of concerns have been raised regarding the potential impacts, and numerous questions have been triggered regarding the specifics of the implementation process for the 1997 standards. Implementation of the 1997 PM<sub>2.5</sub> NAAQS, already delayed considerably, is threatened with further delay as a result of the U.S. Court of Appeals for the D.C. Circuit's July 11, 2008, decision (*North Carolina v. EPA*) that would vacate the Clean Air Interstate Rule (CAIR).<sup>107</sup>

EPA projected that CAIR, in conjunction with other federal measures such as recent auto and truck emission standards, would be sufficient to demonstrate attainment in a large portion of monitored nonattainment counties by 2015, prior to the development and implementation of local measures. Promulgated by EPA under the CAA in May 2005, CAIR would have established a regional cap-and-trade program for sulfur dioxide (SO<sub>2</sub>) and nitrogen oxide (NO<sub>x</sub>) emissions<sup>108</sup> from electric generating units (EGUs) in 28 eastern states and the District of Columbia.<sup>109</sup> Specifically calling for a combination of local and interstate transport control, EPA's CAIR rulemaking developed criteria for determining “highly cost-effective” transport control levels to mitigate interstate transport of SO<sub>2</sub> and NO<sub>x</sub> contributing significantly to PM<sub>2.5</sub> (and ozone) nonattainment. While some Members of Congress and others questioned EPA's predictions regarding the relative magnitude of the emission reductions associated with existing and proposed air quality controls, the vacating of CAIR is seen as significantly hampering downwind states' ability to achieve emission reductions and compliance with the 1997 PM<sub>2.5</sub> (and ozone) NAAQS.

---

<sup>106</sup> Senate Committee on Environment and Public Works, Subcommittee on Clean Air and Nuclear Safety, hearing, “EPA's Clean Air Interstate Rule (CAIR): Recent Court Decision and its Implications,” July 29, 2008, [<http://epw.senate.gov/public/>].

<sup>107</sup> 42 U.S.C. 7401 et seq.

<sup>108</sup> SO<sub>2</sub> emissions cause acid precipitation, and SO<sub>2</sub> is also among the pollutants that form fine particles (PM<sub>2.5</sub>) in the atmosphere. NO<sub>x</sub> contributes to both PM<sub>2.5</sub> and to the formation of ground-level ozone.

<sup>109</sup> While virtually all eastern states were affected by the rule, three were subject only to the SO<sub>2</sub>-NO<sub>x</sub> annual caps, and five only to the seasonal NO<sub>x</sub> cap; the other 20 states and DC were subject to all three caps. See EPA Fact Sheet, p. 3, at [[http://www.epa.gov/CAIR/pdfs/cair\\_final\\_fact.pdf](http://www.epa.gov/CAIR/pdfs/cair_final_fact.pdf)].

CAIR has been viewed as the linchpin that held together the Administration's strategy for improving air quality through not only the attainment of the ozone and fine particulate NAAQS, but also by achieving reductions in mercury emissions from coal-fired powerplants, by addressing regional haze impacts from powerplants, and by responding to state petitions to control upwind sources of ozone and fine particulate pollution under § 126 of the CAA. The court's decision that would vacate CAIR presents all stakeholders with a complicated task. As advised by EPA guidance, many SIPs for demonstrating attainment of the 1997 PM<sub>2.5</sub> NAAQS already submitted or nearing completion have relied on emission reductions required by CAIR. These SIPs will have to be revised, and downwind states may have to rely on provisions in § 126 of the CAA to address interstate transport of PM<sub>2.5</sub>, unless the intent of CAIR can somehow otherwise be revived.

Time is in short supply for states and cities in nonattainment. Although EPA and others have requested a rehearing en blanc of the July 2008 decision, whether the court would grant such rehearing is in question. Whatever the outcome and course(s) of action taken, deadlines for states to submit their SIPs for 1997 PM<sub>2.5</sub> NAAQS have elapsed, and deadlines for reaching attainment are looming. Given the most recent events and the potential for further delays in implementing the 1997 standards, some have questioned whether moving directly to implementation of the revised particulates NAAQS promulgated by EPA in October 2006 should be considered. However, opponents contend that an approach relying on the schedule for the 2006 revised particulates NAAQS would further delay the projected benefits of reducing exposures to PM<sub>2.5</sub>. In addition, the 2006 revised particulates NAAQS have sparked their own controversies and have been challenged in the courts.

Given that several key implementation milestones and attainment deadlines are nearing, PM<sub>2.5</sub> will likely remain an issue of considerable debate for many stakeholders and interest groups, as well as Congress.

## Appendix. Implementation of the 1997 PM<sub>2.5</sub> NAAQS: Timeline and Delays

Because of legal challenges, the lack of a national monitoring network, and other factors, implementation of the 1997 PM<sub>2.5</sub> NAAQS has been delayed since it was promulgated. The timeline presented in **Table 2** below reflects the most recent key milestone dates for implementing the 1997 PM<sub>2.5</sub> NAAQS, including actual completions. These milestones are driven primarily by statutory requirements. It follows an EPA milestone schedule outlined in an April 21, 2003, memorandum to EPA regional administrators that also provided the nonbinding guidance for implementation of the PM<sub>2.5</sub> area designations.<sup>110</sup> Recognizing potential efficiencies associated with states and tribes being able to harmonize control strategies, the initial PM<sub>2.5</sub> schedule was intended to be similar to that for the eight-hour ozone program.

**Table 2. Schedule for Implementation of the 1997 PM<sub>2.5</sub> NAAQS**

Date	1997 PM <sub>2.5</sub> NAAQS Milestones
February 2004 (completed)	State-tribal area designation recommendations (based on 2000-2002 monitoring data)
June-July 2004 (completed)	EPA notifies states and tribes regarding modifications to their recommendations
January 5, 2005 (completed) (70 <i>Federal Register</i> 944)	EPA promulgates final area designations (required one year after states and tribes make recommendations)
February 2005 (completed November 1, 2005) (70 <i>Federal Register</i> 65984)	EPA proposes PM <sub>2.5</sub> implementation rule
April 5, 2006 (one year after the final designation April 5, 2005 effective date)	States with new transportation projects submit conformity determination within one year of the effective date of nonattainment designation
Mid-2007 (completed April 25, 2007)	EPA promulgates final PM <sub>2.5</sub> implementation rule
April 2008 (ongoing; 3 years after final area designations effective date)	States and tribes submit revised implementation plans (SIPs) to achieve PM <sub>2.5</sub> compliance in nonattainment areas
April 2010-2015 (5-10 years after final area designations effective date)	NAAQS statutory compliance deadline for attainment

**Source:** Prepared by the Congressional Research Service based on U.S. Environmental Protection Agency fact sheets and guidance documents, and relevant *Federal Register* notices.

The PM<sub>2.5</sub> NAAQS requirement for three years of monitoring data to determine whether areas were meeting the established limits was one factor responsible for

---

<sup>110</sup> EPA memorandum, April 21, 2003, from the Office of Air and Radiation Assistant Administrator Jeffrey R. Holmstead to EPA Regional Administrators, available at [[http://www.epa.gov/ttn/naaqs/pm/pm25\\_guide.html](http://www.epa.gov/ttn/naaqs/pm/pm25_guide.html)].

delaying implementation. Comprehensive monitoring data sufficient to make this determination and the attainment designations were not available in 1997. Recognizing this dilemma, in the 1998 Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21; P.L. 105-178, Title VI), Congress revised the statutory deadline requirements for the new NAAQS, predicated on a previously released EPA Interim Implementation Policy. TEA-21 required states to submit designation recommendations within one year after receipt of three years of data meeting defined federal protocols, and required EPA to promulgate designations within one year after state recommendations were due, but not later than December 31, 2005.

As discussed earlier in this report, operation of the network of monitors was phased in from 1999 through 2000, making three-year monitoring data available at different points, depending on area location. Rather than a staggered designation schedule, which would likely have resulted in hampering cross-coordination of implementation plans, EPA proposed a single date for state and tribal recommendations and final EPA designations. The deadlines of February 15, 2004, for governors to submit their PM<sub>2.5</sub> designation recommendations and December 31, 2004, for EPA to promulgate designations for each state, were the result of Congress amending the CAA in the FY2004 omnibus appropriations (P.L. 108-199).

In addition to the delay in establishing a monitoring network, the 1997 NAAQS standards were challenged in District Court by the American Trucking Associations, the U.S. Chamber of Commerce, and several other state and business groups. An initial May 1999 opinion by the District Court partially in favor of the plaintiffs was reversed by the Supreme Court in February 2001.<sup>111</sup>

---

<sup>111</sup> United States Court of Appeals for the District of Columbia Circuit, argued December 17, 1998; decided May 14, 1999 (No. 97-1440). *American Trucking Associations, Inc., et al., Petitioners v. United States Environmental Protection Agency; Whitman v. American Trucking Associations*, U.S. Supreme Court, No. 99-1257 and No. 99-1426, February 27, 2001 (121 S. Ct. 903). See CRS Report RS20860, *The Supreme Court Upholds EPA Standard Setting Under the Clean Air Act: Whitman v. American Trucking Associations*, by Robert Meltz and James E. McCarthy.