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Clean Air Act: A Summary of the Act and Its Major Requirements

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Summary

This report summarizes the Clean Air Act and its major regulatory requirements. The principal statute addressing air quality concerns, the Clean Air Act was first enacted in 1955, with major revisions in 1970, 1977, and 1990. The act

- requires EPA to set health-based standards for ambient air quality;
- sets deadlines for the achievement of those standards by state and local governments;
- requires EPA to set national emission standards for large or ubiquitous sources of air pollution, including motor vehicles, power plants, and other industrial sources;
- mandates emission controls for sources of 187 hazardous air pollutants;
- establishes a cap-and-trade program to limit acid rain;
- requires the prevention of significant deterioration of air quality in areas with clean air;
- requires a program to restore visibility impaired by regional haze in national parks and wilderness areas; and
- implements the Montreal Protocol to phase out most ozone-depleting chemicals.

This report describes the act's major provisions and provides tables listing all major amendments, with the year of enactment and Public Law number, and cross-referencing sections of the act with the major U.S. Code sections of the codified statute.

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Introduction

The authorities and responsibilities of the U.S. Environmental Protection Agency (EPA) derive primarily from a dozen major environmental statutes. This report provides a concise summary of one of those statutes, the Clean Air Act. It provides a very brief history of federal involvement in air quality regulation and of the provisions added by legislation in 1970, 1977, and 1990; it explains major authorities contained in the act; it defines key terms; and it lists references for more detailed information on the act and its implementation.

While this report attempts to present the essence of the act, it is necessarily incomplete. Many details and secondary provisions are omitted. In addition, the report describes the statute largely without discussing its implementation. Statutory deadlines to control emissions and achieve particular mandates have often been missed as a result of delayed standard-setting by EPA, delayed action on implementation by states and local governments, or law suits brought by interested parties. Other CRS products, including CRS Report R45451, *Clean Air Act Issues in the 116th Congress*, and more than a dozen other CRS reports, discuss implementation concerns and current issues.

Overview

The Clean Air Act, codified as 42 U.S.C. 7401 et seq., seeks to protect human health and the environment from emissions that pollute ambient, or outdoor, air. It requires EPA to establish minimum national standards for air quality, and assigns primary responsibility to the states to assure compliance with the standards. Areas not meeting the standards, referred to as "nonattainment areas," are required to implement specified air pollution control measures. The act establishes federal standards for mobile sources of air pollution and their fuels and for sources of 187 hazardous air pollutants, and it establishes a cap-and-trade program for the emissions that cause acid rain. It establishes a comprehensive permit system for all major sources of air pollution. It also addresses the prevention of pollution in areas with clean air and protection of the stratospheric ozone layer.

Like many other programs administered by the EPA, federal efforts to control air pollution have gone through several phases, beginning with information collection, research, and technical assistance, before being strengthened to establish federal standards and enforcement. Federal legislation addressing air pollution was first passed in 1955, prior to which air pollution was the exclusive responsibility of state and local levels of government.

The federal role was strengthened in subsequent amendments, notably the Clean Air Act Amendments of 1970, 1977, and 1990. The 1970 amendments established the procedures under which EPA sets national standards for ambient air quality, required a 90% reduction in emissions from new automobiles by 1975, established a program to require the best available control technology at major new sources of air pollution, established a program to regulate air toxics, and greatly strengthened federal enforcement authority. The 1977 amendments adjusted the auto emission standards, extended deadlines for the attainment of air quality standards, and added the Prevention of Significant Deterioration program to protect air cleaner than national standards.

Table 1. Clean Air Act and Amendments

(codified generally as 42 U.S.C. 7401-7671)

Year	Act	Public Law Number
1955	Air Pollution Control Act	P.L. 84-159
1959	Reauthorization	P.L. 86-353
1960	Motor vehicle exhaust study	P.L. 86-493
1963	Clean Air Act Amendments	P.L. 88-206
1965	Motor Vehicle Air Pollution Control Act	P.L. 89-272, Title I
1966	Clean Air Act Amendments of 1966	P.L. 89-675
1967	Air Quality Act of 1967 National Air Emission Standards Act	P.L. 90-148
1970	Clean Air Act Amendments of 1970	P.L. 91-604
1973	Reauthorization	P.L. 93-13
1974	Energy Supply and Environmental Coordination Act of 1974	P.L. 93-319
1977	Clean Air Act Amendments of 1977	P.L. 95-95
1980	Acid Precipitation Act of 1980	P.L. 96-294, Title VII
1981	Steel Industry Compliance Extension Act of 1981	P.L. 97-23
1987	Clean Air Act 8-month Extension	P.L. 100-202
1990	Clean Air Act Amendments of 1990	P.L. 101-549
1991	Technical correction to list of hazardous air pollutants	P.L. 102-187
1995-96	Relatively minor laws amending the act	P.L. 104-6, 59, 70, 260
1998	Amended §604 re methyl bromide	P.L. 105-277, §764
1998	Border Smog Reduction Act of 1998	P.L. 105-286
1999	Chemical Safety Information, Site Security and Fuels Regulatory Relief Act	P.L. 106-40
2004	Amendments to §209 re small engines	P.L. 108-199, Division G, Title IV, §428
2005	Energy Policy Act of 2005 (amended §211 re fuels)	P.L. 109-58
2007	Energy Independence and Security Act of 2007 (amended §211 re fuels)	P.L. 110-140
2011	Amendments re Alaskan Outer Continental Shelf sources and ozone depleting substances	P.L. 112-74, §432, and P.L. 112-81, §320
2014	Amendment to §207 re motor vehicle dealer certification	P.L. 113-109
2015	Amendment regarding specially produced motor vehicles	P.L. 114-94, §24405
2020	Amendment to §103(g), re research related to direct air capture of carbon dioxide and carbon storage in deep saline formations.	P.L. 116-260, Division S, §102(b)

Changes to the act in 1990 included provisions to (1) classify most nonattainment areas according to the extent to which they exceed the standard, tailoring deadlines, planning, and controls to each area's status; (2) tighten auto and other mobile source emission standards; (3) require reformulated and alternative fuels in the most polluted areas; (4) revise the air toxics section, establishing a new program of technology-based standards and addressing the problem of sudden,

catastrophic releases of air toxics; (5) establish an acid rain control program, with a marketable allowance scheme to provide flexibility in implementation; (6) require a state-run permit program for the operation of major sources of air pollutants; (7) implement the Montreal Protocol to phase out most ozone-depleting chemicals; and (8) update the enforcement provisions so that they parallel those in other pollution control acts, including authority for EPA to assess administrative penalties.

The 1990 amendments also authorized appropriations for clean air programs through FY1998. The act has not been reauthorized since then. House rules require enactment of an authorization before an appropriation bill can be considered; but this requirement can be waived and frequently has been. Thus, while authorization of appropriations in the Clean Air Act (and most other environmental statutes) has expired, programs have continued and have been funded. The act's other legal authorities, to issue and enforce regulations, are, for the most part, permanent and are not affected by the lack of authorization.

The remainder of this report describes major programs required by the act, with an emphasis on the changes established by the 1990 amendments.

National Ambient Air Quality Standards

In section 109, the act requires EPA to establish National Ambient Air Quality Standards (NAAQS) for air pollutants that endanger public health or welfare,[1] in the administrator's judgment, and whose presence in ambient air results from numerous or diverse sources. The NAAQS must be designed to protect public health with an adequate margin of safety and to protect public welfare from any known or anticipated adverse effects. Using this authority, EPA has promulgated NAAQS for six air pollutants or groups of pollutants: sulfur dioxide (SO_2), particulate matter ($PM_{2.5}$ and PM_{10}), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone,[2] and lead. The act requires EPA to review the scientific data upon which the standards are based every five years, and revise the standards, if necessary. More often than not, EPA has taken more than five years in reviewing the standards, but the establishment of a deadline has allowed interested parties to force review of the standards by filing suit.

Originally, the act required that the NAAQS be attained by 1977 at the latest, but the states experienced widespread difficulty in complying with this deadline. As a result, the deadlines for achieving NAAQS have been extended several times. Under the 1990 amendments, most areas not in attainment with NAAQS must meet special compliance schedules, staggered according to the severity of an area's air pollution problem. The amendments also established specific requirements for each nonattainment category, as described below.

State Implementation Plans

While the act authorizes EPA to set NAAQS, the states are responsible for establishing procedures to attain and maintain the standards. Under Section 110 of the act, the states adopt

[1] *Welfare* is defined by the act to include 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.

[2] Unlike most other NAAQS pollutants, ozone is not directly emitted, but rather is formed in the atmosphere by the interaction of volatile organic compounds (VOCs) and nitrogen oxides (NOx) in the presence of sunlight. The control of ozone is, thus, based on regulating emissions of VOCs and NOx. Many particulates also form in the atmosphere after transformation of precursor emissions.

plans, known as State Implementation Plans (SIPs), and submit them to EPA to ensure that they are adequate to meet statutory requirements.

SIPs are based on emission inventories and computer models to determine whether air quality violations will occur. If these data show that standards would be exceeded, the state must impose additional controls on existing sources to ensure that emissions do not cause "exceedances" of the standards. Proposed new and modified sources must obtain state construction permits in which the applicant shows how the anticipated emissions will not exceed allowable limits. In nonattainment areas, emissions from new or modified sources must also be offset by reductions in emissions from existing sources.

The 1990 amendments require EPA to impose sanctions in areas which fail to submit a SIP, fail to submit an adequate SIP, or fail to implement a SIP: unless the state corrects such failures, a 2-to-1 emissions offset for the construction of new polluting sources is imposed 18 months after notification to the state, and a ban on most new federal highway grants is imposed 6 months later. An additional ban on air quality grants is discretionary. Ultimately, a Federal Implementation Plan may be imposed if the state fails to submit or implement an adequate SIP.

The amendments also require that, in nonattainment areas, no federal permits or financial assistance may be granted for activities that do not "conform" to a SIP. This requirement can cause a temporary suspension in funding for most new highway and transit projects if an area fails to demonstrate that the emissions caused by such projects are consistent with attainment and maintenance of ambient air quality standards. Demonstrating conformity of transportation plans and SIPs is required in nonattainment areas whenever new plans are submitted.

Nonattainment Requirements

In a major departure from the prior law, the 1990 Clean Air Act Amendments grouped most nonattainment areas into classifications based on the extent to which the NAAQS was exceeded, and established specific pollution controls and attainment dates for each classification. These requirements are described here as spelled out in Sections 181-193 of the act.[3]

Nonattainment areas are classified on the basis of a "design value," which is derived from the pollutant concentration (in parts per million or micrograms per cubic meter) recorded by air quality monitoring devices. The design value for the one-hour ozone standard was the fourth highest hourly reading measured during the most recent three-year period. Using these design values, the act created five classes of ozone nonattainment, as shown in **Table 2**. Initially, only Los Angeles fell into the "extreme" class, but 97 other areas were classified in one of the other four ozone categories. The classification system and design values have since been adapted twice as the ozone standard has been revised. Under the 2015 standard, there are 51 nonattainment areas as of December 2019, all but 6 of which are classified as "marginal" or "moderate" (see **Table 3**).[4] A simpler classification system established moderate and serious nonattainment areas

[3] EPA modified the ozone standard, specified in the statute as 0.12 parts per million (ppm) averaged over a one-hour period, to 0.08 ppm averaged over an eight-hour period, through regulations promulgated in July 1997. In April 2004, the agency promulgated an implementation rule for the new eight-hour standard. Under this rule, the one-hour standard was revoked as of June 15, 2005, and areas that had not yet attained it were converted to new classifications depending on their eight-hour concentration of ozone. In general, the former one-hour nonattainment areas remain subject to the controls specified for their one-hour category, but most areas were given additional time to attain the new standard. The ozone standard was revised again in March 2008, to 0.075 ppm averaged over eight hours and in October 2015, to 0.070 ppm averaged over eight hours.

[4] EPA, *Green Book*, 8-Hour Ozone (2015) Designated Area/State Information, data current as of December 31, 2019, https://www3.epa.gov/airquality/greenbook/jbtc.html.

for carbon monoxide and particulate matter with correspondingly more stringent control requirements for the more polluted class.

Table 2. Statutory Ozone Nonattainment Classifications

Class	Marginal	Moderate	Serious	Severe	Extreme
Deadline	1993	1996	1999	2005-2007[a]	2010
Areas[b]	42 areas	32 areas	14 areas	9 areas	1 area
Design Value	0.121 ppm-0.138 ppm	0.138 ppm-0.160 ppm	0.160 ppm-0.180 ppm	0.180 ppm-0.280 ppm	≥0.280 ppm

a. Areas with a 1988 design value between 0.190 and 0.280 ppm had 17 years to attain; others had 15 years.

b. Number of areas in each category as of the date of enactment.

As shown in **Table 2**, the statutory attainment deadlines for ozone nonattainment areas stretched from 1993 to 2010, depending on the severity of the problem. Under the current eight-hour ozone standard, shown in **Table 3**, these deadlines are changed to 2021 to 2038.

Table 3. Ozone Nonattainment Classifications, as of December 2019

Class	Marginal	Moderate	Serious	Severe[a]	Extreme
Deadline	2021	2024	2027	2033-[a]	2038
Areas[b]	40 areas	5 areas	2 areas	2 areas	2 areas
Design Value[c]	0.071 ppm-0.081 ppm	0.081 ppm-0.093 ppm	0.093 ppm-0.105 ppm	0.105 ppm-0.111 ppm	≥0.163 ppm

a. Areas with a design value between 0.105 and 0.111 ppm have 15 years to attain ("Severe 15"). Areas with a design value between 0.111 and 0.163 ppm have 17 years to attain ("Severe 17"); as of December 31, 2019, there are not any Severe 17 areas with respect to the 2015 ozone standard.

b. Number of areas in each category as of December 2019.

c. Except for the Extreme classification, the design values for each classification range from the lower value given up to, but not including, the higher value.

For carbon monoxide, the attainment date for moderate areas was December 31, 1995, and for serious areas, December 31, 2000. Since 2010, there have been no carbon monoxide nonattainment areas.

For particulate matter, the deadline for areas designated moderate nonattainment as of 1990 was December 31, 1994; for those areas subsequently designated as moderate, the deadline is six years after designation. For serious areas, the respective deadlines are December 31, 2001, or 10 years after designation.

Requirements for Ozone Nonattainment Areas

Although areas with more severe air pollution problems have a longer time to meet the standards, more stringent control requirements are imposed in areas with worse pollution. A summary of the primary ozone control requirements for each nonattainment category follows.

Marginal Areas

- Inventory emissions sources (to be updated every three years).

- Require 1.1 to 1 offsets (i.e., new major emission sources of volatile organic compounds [VOCs] must reduce VOC emissions from existing facilities in the area by 10% more than the emissions of the new facility).
- Impose reasonably available control technology (RACT) on all major sources emitting more than 100 tons per year for the nine industrial categories where EPA had already issued control technique guidelines describing RACT prior to 1990.

Moderate Areas

- Meet all requirements for marginal areas.
- Impose a 15% reduction in VOC emissions in six years.
- Adopt a basic vehicle inspection and maintenance program.
- Impose RACT on all major sources emitting more than 100 tons per year for all additional industrial categories where EPA will issue control technique guidelines describing RACT.
- Require vapor recovery at gas stations selling more than 10,000 gallons per month.
- Require 1.15 to 1 offsets.

Serious Areas

- Meet all requirements for moderate areas.
- Reduce definition of a major source of VOCs from emissions of 100 tons per year to 50 tons per year for the purpose of imposing RACT.
- Reduce VOCs 3% annually for years 7 to 9 after the 15% reduction already required by year 6.
- Improve monitoring, in order to obtain more comprehensive and representative data on ozone pollution.
- Adopt an enhanced vehicle inspection and maintenance program.
- Require fleet vehicles to use clean alternative fuels.
- Adopt transportation control measures if the number of vehicle miles traveled in the area is greater than expected.
- Require 1.2 to 1 offsets.
- Adopt contingency measures if the area does not meet required VOC reductions.

Severe Areas

- Meet all requirements for serious areas.
- Reduce definition of a major source of VOCs from emissions of 50 tons per year to 25 tons per year for the purpose of imposing RACT.
- Adopt specified transportation control measures.
- Implement a reformulated gasoline program.
- Require 1.3 to 1 offsets.
- Impose $5,000 per ton penalties on major sources if the area does not meet required reductions.

Extreme Areas

- Meet all requirements for severe areas.
- Reduce definition of a major source of VOCs from emissions of 25 tons per year to 10 tons per year for the purpose of imposing RACT.
- Require clean fuels or advanced control technology for boilers emitting more than 25 tons per year of NO_x.
- Require 1.5 to 1 offsets.

Requirements for Carbon Monoxide Nonattainment Areas

As with ozone nonattainment areas, carbon monoxide (CO) nonattainment areas are subjected to specified control requirements, with more stringent requirements in Serious nonattainment areas. A summary of the primary CO control requirements for each nonattainment category follows.

Moderate Areas

- Conduct an inventory of emissions sources.
- Forecast total vehicle miles traveled in the area.
- Adopt an enhanced vehicle inspection and maintenance program.
- Demonstrate annual improvements sufficient to attain the standard.

Serious Areas

- Adopt specified transportation control measures.
- Implement an oxygenated fuels program for all vehicles in the area.
- Reduce definition of a major source of CO from emissions of 100 tons per year to 50 tons per year if stationary sources contribute significantly to the CO problem.

Serious areas failing to attain the standard by the deadline had to revise their SIP and demonstrate reductions of 5% per year until the standard was attained. As stated earlier, all areas have now attained the standard.

Requirements for Particulate Nonattainment Areas

Particulate (PM_{10}) nonattainment areas are also subject to specified control requirements. These are the following:

Moderate Areas

- Require permits for new and modified major stationary sources of PM_{10}.
- Impose reasonably available control measures (RACM).

Serious Areas

- Impose best available control measures (BACM).
- Reduce definition of a major source of PM_{10} from 100 tons per year to 70 tons per year.

In July 1997, EPA promulgated new standards for fine particulates ($PM_{2.5}$). Implementation of the $PM_{2.5}$ standards was delayed by court challenges and by the initial absence of a monitoring network capable of measuring the pollutant. Nonattainment areas for $PM_{2.5}$ were designated on April 14, 2005. States had three years subsequent to designation to submit State Implementation

Plans. Revisions to the NAAQS promulgated in October 2006 and January 2013 strengthened the $PM_{2.5}$ standard and triggered new rounds of nonattainment area designations.

Transported Air Pollution

Meeting the nation's clean air standards can be complicated, as air pollution is no respecter of political boundaries or subdivisions. This problem of transported air pollutants has come into particular focus as states and EPA attempt to develop effective compliance strategies to achieve both the ozone and the $PM_{2.5}$ NAAQS. Under Section 110(a)(2)(D), SIPs must include adequate provisions to prevent sources within that state from contributing significantly to nonattainment in one or more downwind states. This provision is often referred to as the act's "Good Neighbor" provision.

The Clean Air Act provides statutory authorities to facilitate compliance with the Good Neighbor provision. For example, if EPA finds a SIP inadequate to achieve a NAAQS, it must require the affected state to submit a revised SIP that includes sufficient measures to bring that state into compliance. This is known as a "SIP Call." The 1990 Clean Air Act amendments provided EPA and the states with new tools to address the transport problem. One of those tools is Section 176A, a provision that permits EPA, either on its own or by petition from any state, to establish a transport region to address regional pollution problems contributing to violations of a primary NAAQS. A commission of EPA and state officials is constituted to make recommendations to EPA on appropriate mitigation strategies. Based on the commission's findings and recommendations, EPA is then required under section 110(k)(5) to notify affected states of inadequacies in their current state implementation plans and to establish deadlines (not to exceed 18 months) for submitting necessary revisions. Besides authorizing administratively-created transport regions, the 1990 amendments statutorily created an Ozone Transport Region (OTR) in the Northeast. This provision (Section 184 of the act) required specific additional controls for all areas (not only nonattainment areas) in that region, and established the Ozone Transport Commission for the purpose of recommending to EPA region-wide controls affecting all areas in the region.

The transport issue may also be addressed by affected downwind states through a Section 126 petition. As amended by the 1990 Clean Air Act amendments, under Section 126(b) any state or political subdivision may petition EPA for a finding that a major source or group of stationary sources located in another state is emitting pollutants that "significantly contribute" to the nonattainment of a NAAQS by their state. EPA is to respond to the petition within 60 days. If the petition is granted, the offending sources must cease operations within three months unless the sources comply with emission controls and the compliance schedules as determined by EPA to bring them into compliance with the section. For more information about interstate transport issues under the Clean Air Act, see CRS Report R45299, *The Clean Air Act's Good Neighbor Provision: Overview of Interstate Air Pollution Control*, by Kate C. Shouse.

Emission Standards for Mobile Sources

Title II of the Clean Air Act has required emission standards for automobiles since 1968. The 1990 amendments significantly tightened these standards: for light-duty vehicles (a category that includes cars, SUVs, minivans, and most pickup trucks), the hydrocarbon standard was reduced by 40% and the nitrogen oxides (NO_x) standard by 50%. These standards—referred to as "Tier 1" standards—were phased in over the 1994-1996 model years.

The amendments envisioned a further set of reductions ("Tier 2" standards), but not before model year 2004. For Tier 2 standards to be promulgated, the agency was first required to report to Congress concerning the need for further emission reductions, the availability of technology to achieve such reductions, and the cost-effectiveness of such controls compared to other means of attaining air quality standards. EPA submitted this report to Congress in August 1998, concluding that further emission reductions were needed and that technology to achieve such reductions was available and cost-effective. Tier 2 standards, requiring emission reductions of 77% to 95% from cars and light trucks were promulgated in February 2000, and were phased in over the 2004-2009 model years. To facilitate the use of more effective emission controls, the standards also required a more than 90% reduction in the sulfur content of gasoline, beginning in 2004. In 2014, EPA completed a similar process to impose "Tier 3" standards on light duty vehicles and gasoline. The Tier 3 standards, which are being phased in between 2017 and 2025, will require further reductions of 70-80% in emissions, as compared to Tier 2, and have already cut the remaining sulfur in gasoline by two-thirds.

The 1990 amendments also required that oxygenated gasoline, designed to reduce emissions of carbon monoxide, be sold in the worst CO nonattainment areas and that "reformulated" gasoline (RFG), designed to reduce emissions of volatile organic compounds and toxic air pollutants, be sold in the nine worst ozone nonattainment areas (Los Angeles, San Diego, Houston, Baltimore, Philadelphia, New York, Hartford, Chicago, and Milwaukee); metropolitan Washington, DC, and four areas in California were added to the mandatory list later. Other ozone nonattainment areas can opt in to the RFG program; additional areas in 14 states have done so, although several subsequently opted out.

The fuels provisions were modified by the Energy Policy Act of 2005 (EPACT), removing the requirement that RFG contain oxygenates. Instead, EPACT required the use of increasing amounts of renewable fuel, most likely to be ethanol, in motor fuels, beginning in 2006. The Energy Independence and Security Act of 2007 further strengthened the renewable fuel requirements.

Use of alternative fuels and development of cleaner engines was also to be stimulated by the Clean Fuel Fleet Program. In all of the most seriously polluted ozone and CO nonattainment areas, centrally fueled fleets of 10 or more passenger cars and light-duty trucks had to purchase at least 30% clean-fuel vehicles when they add new vehicles to existing fleets, starting in 1999. (The act originally required the program to begin in 1998, but the start was delayed by a year.) The percentage rose to 50% in 2000 and 70% in 2001. Heavy-duty fleets were required to purchase at least 50% clean-fuel vehicles annually. A clean-fuel vehicle is one which meets Low Emission Vehicle (LEV) standards and operates on reformulated gasoline, reformulated diesel, methanol, ethanol, natural gas, liquefied petroleum gas, hydrogen, or electricity.

The 1990 amendments also imposed tighter requirements on emissions allowed during refueling, on low temperature CO emissions, on in-use performance over time, on warranties for the most expensive emission control components (8 years/80,000 miles for the catalytic converter, electronic emissions control unit, and onboard emissions diagnostic unit), and on certification (an auto's useful life was defined as 100,000 miles instead of the earlier 50,000 miles—a figure since increased through regulation to 120,000 or 150,000 miles depending on the standards). Regulations were also extended to include nonroad fuels and engines.

Standards for trucks and buses using diesel engines were also strengthened. The 1990 amendments required new urban buses to reduce emissions of diesel particulates 92% by 1996, and all other heavy-duty diesel engines to achieve an 83% reduction by the same year. NO_x emissions must also be reduced, 33% by 1998. Authority to further strengthen these standards led to promulgation in January 2001 of new emission standards requiring a further 90%-95%

reduction in emissions phased in over the 2007-2010 model years, and a reduction of 97% in the allowable amount of sulfur in highway diesel fuel. These regulations were followed in May 2004 by similar requirements for nonroad diesel equipment, which were phased in between 2007 and 2015.

In addition to the CAA's specific requirements discussed above, Section 202 of the act requires the EPA administrator to prescribe "standards applicable to the emission of *any air pollutant* [emphasis added] from any class or classes of new motor vehicles or new motor vehicle engines, which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." Beginning in 2010, this language has been used to authorize standards for greenhouse gas (GHG) emissions from cars and trucks. EPA has promulgated two rounds of GHG standards for light duty vehicles, covering model years 2012-2025, and two rounds of GHG standards for medium- and heavy-duty trucks, covering model years 2014-2027. EPA has subsequently reviewed some of these standards, proposing to change the GHG standards for new light-duty vehicles for model years 2021 to 2025.[5] As of January 2019, EPA has not finalized the proposed changes to the light-duty vehicle GHG standards. For additional information, see CRS Report R45204, *Vehicle Fuel Economy and Greenhouse Gas Standards: Frequently Asked Questions*, by Richard K. Lattanzio, Linda Tsang, and Bill Canis.

Questions of federal preemption of state regulations can arise when state law operates in an area that may also be of concern to the federal government. Under the Supremacy Clause of the U.S. Constitution,[6] state law that conflicts with federal law must yield to the exercise of Congress's powers.[7] When it acts, Congress can preempt state laws or regulations within a field entirely, preempt only state laws or regulations that conflict with federal law, or allow states to act freely.[8] Title II of the CAA generally preempts states from adopting their own emission standards for new motor vehicles or engines.[9] However, CAA Section 209(b) provides an exception to federal preemption of state vehicle emission standards:

> The [EPA] Administrator shall, after notice and opportunity for public hearing, waive application of this section [the preemption of State emission standards] to any State which has adopted standards (other than crankcase emission standards) for the control of emissions from new motor vehicles or new motor vehicle engines prior to March 30, 1966, if the State determines that the State standards will be, in the aggregate, at least as protective of public health and welfare as applicable Federal standards. (footnote: CAA §209(a), 42 U.S.C. §7543(a). See also S.Rept. 91-1196, at 32 (1970). The CAA places three conditions on the grant of such waivers: The Administrator is to deny a waiver if he finds: (1) that the state's determination is arbitrary and capricious; (2) that the state does not need separate standards to meet compelling and extraordinary conditions; or (3) that the state's standards and accompanying enforcement procedures are not consistent with Section 202(a) of the act. (42 U.S.C. §7543(b)(1)(A)-(C).)

Only California can qualify for such a preemption waiver because it is the only state that adopted motor vehicle emission standards "prior to March 30, 1966." According to EPA records, since

[5] EPA and National Highway Traffic Safety Administration, "The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks," 83 *Federal Register* 42986, August 24, 2018.

[6] U.S. Const. art. VI, cl. 2.

[7] Gade v. Nat'l Solid Wastes Mgmt. Assn., 505 U.S. 88, 108 (1992).

[8] Ibid., p. 98. Congress can disavow an intent to preempt certain categories of state law by including a "savings clause" to that effect in federal statutes, see, e.g., 29 U.S.C. §1144(b), or by allowing federal administrative agencies to grant "preemption waivers" to states in certain circumstances, see 42 U.S.C. §7543(b).

[9] CAA §209(a), 42 U.S.C. §7543(a). See also S.Rept. 91-1196, at 32 (1970).

1967, California has submitted over 100 waiver requests for new or amended standards or "within the scope" determinations (i.e., a request that EPA rule on whether a new state regulation is within the scope of a waiver that EPA has already issued).[10] Additionally, the CAA allows other states to adopt California's motor vehicle emission standards under certain conditions.[11] Section 177 requires, among other things, that such standards be identical to the California standards for which a waiver has been granted. States are not required to seek EPA approval under the terms of Section 177.

Hazardous Air Pollutants

Completely rewritten by the Clean Air Act Amendments of 1990, Section 112 of the act establishes programs for protecting public health and the environment from exposure to toxic air pollutants. As revised by the 1990 amendments, the section contains four major provisions: Maximum Achievable Control Technology (MACT) requirements; health-based standards; Generally Available Control Technology (GACT) standards for stationary "area sources" (small, but numerous sources, such as gas stations or dry cleaners, that collectively emit significant quantities of hazardous pollutants); and requirements for the prevention of catastrophic releases.

First, EPA is to establish technology-based emission standards, called MACT standards, for sources of 187 pollutants listed in the legislation, and to specify categories of sources subject to the emission standards.[12] EPA is to revise the standards periodically (at least every eight years). EPA can, on its own initiative or in response to a petition, add or delete substances or source categories from the lists.

Section 112 establishes a presumption in favor of regulation for the designated chemicals; it requires regulation of a designated pollutant unless EPA or a petitioner is able to show "that there is adequate data on the health and environmental effects of the substance to determine that emissions, ambient concentrations, bioaccumulation or deposition of the substance may not reasonably be anticipated to cause any adverse effects to human health or adverse environmental effects" (Clean Air Act Section 112(b)(3)).

EPA is required to set standards for sources of the listed pollutants that achieve "the maximum degree of reduction in emissions" taking into account cost and other non-air-quality factors. These MACT standards for new sources "shall not be less stringent than the most stringent emissions level that is achieved in practice by the best controlled similar source" (Clean Air Act Section 112(d)(3)). The standards for existing sources may be less stringent than those for new sources, but must be no less stringent than the emission limitations achieved by either the best performing 12% of existing sources (if there are more than 30 such sources in the category or subcategory) or the best performing 5 similar sources (if there are fewer than 30). Existing sources are given three years following promulgation of standards to achieve compliance, with a possible one-year extension; additional extensions may be available for special circumstances or

[10] See EPA, Vehicle Emissions California Waivers and Authorizations, https://www.epa.gov/state-and-local-transportation/vehicle-emissions-california-waivers-and-authorizations#state (listing *Federal Register* notices of waiver requests and decisions); Letter from Kevin de Leon, president pro tempore, Cal. Senate, et al., to Xavier Becerra, Att'y Gen., Cal. Dep't of Justice, March 16, 2017.

[11] 42 U.S.C. §7507.

[12] The 1990 amendments specified 189 pollutants, but P.L. 102-187, enacted on December 4, 1991, deleted hydrogen sulfide from the list of toxic pollutants, leaving only 188. On December 19, 2005, EPA removed methyl ethyl ketone (MEK) from the list of toxic air pollutants. The total number of listed air toxics is now 187.

for certain categories of sources. Existing sources that achieve voluntary early emissions reductions received a six-year extension for compliance with MACT.

The second major provision of Section 112 directs EPA to set health-based standards to address situations in which a significant residual risk of adverse health effects or a threat of adverse environmental effects remains after installation of MACT. This provision requires that EPA, after consultation with the Surgeon General of the United States, submit a report to Congress on the public health significance of residual risks, and recommend legislation regarding such risks. If Congress does not legislate in response to EPA's recommendations, then EPA is required to issue standards for categories of sources of hazardous air pollutants as necessary to protect the public health with an ample margin of safety or to prevent an adverse environmental effect. A residual risk standard is required for any source emitting a cancer-causing pollutant that poses an added risk to the most exposed person of more than one-in-a-million. Residual risk standards are due eight years after promulgation of MACT for the affected source category. Existing sources have 90 days to comply with a residual risk standard, with a possible 2-year extension. In general, residual risk standards do not apply to area sources.

The law directed EPA to contract with the National Academy of Sciences (NAS) for a study of risk assessment methodology, and created a Risk Assessment and Management Commission to investigate and report on policy implications and appropriate uses of risk assessment and risk management. In 1994 NAS published its report, *Science and Judgment in Risk Assessment*. The Commission study, *Framework for Environmental Health Risk Management*, was released in 1997.

Third, in addition to the technology-based and health-based programs for major sources of hazardous air pollution, EPA is to establish standards for stationary "area sources" determined to present a threat of adverse effects to human health or the environment. The provision requires EPA to regulate the stationary area sources responsible for 90% of the emissions of the 30 hazardous air pollutants that present the greatest risk to public health in the largest number of urban areas. In setting the standard, EPA can impose less stringent "generally available" control technologies, rather than MACT.

Finally, Section 112 addresses prevention of sudden, catastrophic releases of air toxics by establishing an independent Chemical Safety and Hazard Investigation Board. The Board is responsible for investigating accidents involving releases of hazardous substances, conducting studies, and preparing reports on the handling of toxic materials and measures to reduce the risk of accidents.

EPA is also directed to issue prevention, detection, and correction requirements for catastrophic releases of air toxics by major sources. Section 112(r) requires owners and operators to prepare risk management plans including hazard assessments, measures to prevent releases, and a response program.

New Source Performance Standards

Section 111 of the act requires EPA to establish nationally uniform, technology-based standards (called New Source Performance Standards, or NSPS) for categories of new industrial facilities. These standards accomplish two goals: first, they establish a consistent baseline for pollution control that competing firms must meet, and thereby remove any incentive for states or communities to weaken air pollution standards in order to attract polluting industry; and second, they preserve clean air to accommodate future growth, as well as for its own benefits.

NSPS establish maximum emission levels for new major stationary sources—power plants, steel mills, and smelters, for example—with the emission levels determined by the best system of emission reduction (BSER) "adequately demonstrated," taking costs into account. At least every eight years, EPA must review and, if appropriate, revise NSPS applicable to designated sources, since the goal is to prevent new pollution problems from developing and to force the installation of new control technology.

The standards also apply to modifications of existing facilities, through a process called New Source Review (NSR). The law's ambiguity regarding what constitutes a modification (subject to NSR) as opposed to routine maintenance of a facility has led to litigation, with EPA proposing in recent years to modify its interpretation of the requirements of this section.

Section 111 can also be used to set standards for existing stationary sources of pollution. Under Section 111(d), EPA is to require the states to submit plans establishing standards of performance for existing sources that would be subject to NSPS if they were new, unless the sources or the pollutants regulated by the NSPS are already subject to standards under other sections of the act. This authority has rarely been used, because most pollutants and sources are subject to regulation under other sections of the act; but it served as the basis of a rulemaking intended to limit carbon dioxide emissions from existing fossil-fueled power plants.[13]

Solid Waste Incinerators

Prior to 1990, solid waste incinerators, which emit a wide range of pollutants, were subject to varying degrees of state and federal regulation depending on their size, age, and the type of waste burned. In a new Section 129, the 1990 amendments established more consistent federal requirements specifying that emissions of 10 categories of pollutants be regulated at new and existing incinerators burning municipal solid waste, medical waste, and commercial and industrial waste. The amendments also established emissions monitoring and operator training requirements.

Prevention of Significant Deterioration / Regional Haze

Sections 160-169 of the act establish requirements for the prevention of significant deterioration of air quality (PSD). The PSD program reflects the principle that areas where air quality is better than that required by NAAQS should be protected from significant new air pollution even if NAAQS would not be violated.

The act divides clean air areas into three classes, and specifies the increments of sulfur dioxide (SO_2) and particulate pollution allowed in each. Class I areas include international and national parks, wilderness and other pristine areas; allowable increments of new pollution are very small. Class II areas include all attainment and not classifiable areas, not designated as Class I; allowable increments of new pollution are modest. Class III represents selected areas that states may designate for development; allowable increments of new pollution are large (but not so large that the area would exceed NAAQS). Through an elaborate hearing and review process, a state

[13] In 2015, EPA promulgated the Clean Power Plan under Section 111(d) authority to limit carbon dioxide emissions from existing fossil-fueled power plants. In 2019, EPA repealed the Clean Power Plan and promulgated new emission guidelines in the Affordable Clean Energy Rule. See EPA, "Repeal of the Clean Power Plan; Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units; Revisions to Emission Guidelines Implementing Regulations," 84 *Federal Register* 32521, July 8, 2019.

can have regions redesignated from Class II to Class III (although no Class III areas have yet been designated).

While the 1977 amendments only stipulated PSD standards for two pollutants, SO_2 and particulates, EPA is supposed to establish standards for other criteria pollutants. Thus far, only one of the other four (NO_2) has been addressed: the agency promulgated standards for NO_2 in 1988.

Newly constructed polluting sources in PSD areas must install best available control technology (BACT) that may be more strict than that required by NSPS. The justifications of the policy are that it protects air quality, provides an added margin of health protection, preserves clean air for future development, and prevents firms from gaining a competitive edge by "shopping" for clean air to pollute.

In Sections 169A and B, the act also sets a national goal of preventing and remedying impairment of visibility in national parks and wilderness areas, and requires EPA to promulgate regulations to assure reasonable progress toward that goal. In the 1990 Amendments, Congress strengthened these provisions, which had not been implemented.

The amendments required EPA to establish a Grand Canyon Visibility Transport Commission, composed of Governors from each state in the affected region, an EPA designee, and a representative of each of the national parks or wilderness areas in the region. Other visibility transport commissions can be established upon EPA's discretion or upon petition from at least two states. Within 18 months of receiving a report from one of these commissions, EPA is required to promulgate regulations to assure reasonable progress toward the visibility goal, including requirements that states update their State Implementation Plans to contain emission limits, schedules of compliance, and other measures necessary to make reasonable progress. Specifically mentioned is a requirement that states impose Best Available Retrofit Technology on existing sources of emissions impairing visibility.

The Grand Canyon Commission delivered a set of recommendations to EPA in June 1996, and the agency subsequently promulgated a "regional haze" program applicable to all 50 states under this authority.

Acid Deposition Control

The Clean Air Act Amendments of 1990 added an acid deposition control program (Title IV) to the act. It set goals for the year 2000 of reducing annual SO_2 emissions by 10 million tons from 1980 levels and reducing annual NO_x emissions by 2 million tons, also from 1980 levels.

The SO_2 reductions were imposed in two steps. Under Phase 1, owners/operators of 110 high-emitting electric generating facilities listed in the law had to meet tonnage emission limitations by January 1, 1995. This would reduce SO_2 emissions by about 3.5 million tons. Phase 2 included facilities with a nameplate capacity greater than or equal to 75 megawatts, with a deadline of January 1, 2000. Compliance was 100%.

To introduce some flexibility in the distribution and timing of reductions, the act creates a comprehensive permit and emissions allowance system. An allowance is a limited authorization to emit a ton of SO_2. Issued by EPA, the allowances would be allocated to Phase 1 and Phase 2 units in accordance with baseline emissions estimates. Power plants which commence operation after November 15, 1990 would not receive any allowances. These new units would have to obtain allowances (offsets) from holders of existing allowances. Allowances were allowed to be traded nationally during either phase. The law also permitted industrial sources and power plants

to sell allowances to utility systems under regulations developed by EPA. Allowances were allowed to be banked by a utility for future use or sale.

The act provided for two types of sales to improve the liquidity of the allowance system and to ensure the availability of allowances for utilities and independent power producers who need them. First, a special reserve fund consisting of 2.8% of Phase 1 and Phase 2 allowance allocations was set aside for sale. Allowances from this fund (25,000 annually from 1993 to 1999 and 50,000 thereafter) were sold at a fixed price of $1,500 an allowance. Independent power producers had guaranteed rights to these allowances under certain conditions. Second, an annual, open auction sold allowances (150,000 from 1993 to 1995, and 250,000 from 1996 to 1999) with no minimum price. Utilities with excess allowances could have them auctioned off at this auction, and any person could buy allowances.

The act essentially capped SO_2 emissions at individual existing sources through a tonnage limitation, and at future plants through the allowance system. First, emissions from most existing sources were capped at a specified emission rate times an historic baseline level. Second, for plants commencing operation after November 15, 1990, emissions had to be completely offset with additional reductions at existing facilities beginning after Phase 2 compliance. However, as noted above, the law provided some allowances to future power plants which met certain criteria. The utility SO_2 emission cap was set at 8.9 million tons, with some exceptions.

The act provided that if an affected unit did not have sufficient allowances to cover its emissions, it would be subject to an excess emission penalty of $2,000 per ton of SO_2 and required to reduce an additional ton of SO_2 the next year for each ton of excess pollutant emitted.

The act also required EPA to inventory industrial emissions of SO_2 and to report every five years, beginning in 1995. If the inventory showed that industrial emissions may reach levels above 5.60 million tons per year, then EPA was to take action under the act to ensure that the 5.60 million ton cap would not be exceeded.

The act required EPA to set specific NO_x emission rate limitations—0.45 lb. per million Btu for tangentially-fired boilers and 0.50 lb. per million Btu for wall-fired boilers—unless those rates cannot be achieved by low-NO_x burner technology. Tangentially and wall-fired boilers affected by Phase 1 SO_2 controls must also meet NO_x requirements. EPA was to set emission limitations for other types of boilers by 1997 based on low-NO_x burner costs, which EPA did. In addition, EPA was to propose and promulgate a revised new source performance standard for NO_x from fossil fuel steam generating units, which EPA also did, in 1998.

In 2005, 2011, and 2016, EPA used the authority described in the section on "Transported Air Pollution" to further lower the caps on SO_2 and NO_x emissions in the eastern half of the country. As a result, SO_2 and NO_x emissions have been reduced by at least a further 50% since 2005.

Permits

The Clean Air Act Amendments of 1990 added a Title V to the act which requires states to administer a comprehensive permit program for the operation of sources emitting air pollutants. These requirements are modeled after similar provisions in the Clean Water Act. Previously, the Clean Air Act contained limited provision for permits, requiring only new or modified major stationary sources to obtain construction permits (under Section 165 of the act).

Sources subject to the permit requirements generally include major sources that emit or have the potential to emit 100 tons per year of any regulated pollutant, plus stationary and area sources that emit or have potential to emit lesser specified amounts of hazardous air pollutants. However, in

nonattainment areas, the permit requirements also include sources which emit as little as 50, 25, or 10 tons per year of VOCs, depending on the severity of the region's ozone nonattainment status (serious, severe, or extreme).

States were required to develop permit programs and to submit those programs for EPA approval by November 15, 1993. EPA had one year to approve or disapprove a state's submission in whole or in part. After the effective date of a state plan, sources had 12 months to submit an actual permit application.

States are to collect annual fees from sources sufficient to cover the "reasonable costs" of administering the permit program, with revenues to be used to support the agency's air pollution control program. The fee must be at least $25 per ton of regulated pollutants (excluding carbon monoxide). Permitting authorities have discretion not to collect fees on emissions in excess of 4,000 tons per year and may collect other fee amounts, if appropriate.

The permit states how much of which air pollutants a source is allowed to emit. As a part of the permit process, a source must prepare a compliance plan and certify compliance. The term of permits is limited to no more than five years; sources are required to renew permits at that time. State permit authorities must notify contiguous states of permit applications that may affect them; the application and any comments of contiguous states must be forwarded to EPA for review. EPA can veto a permit; however, this authority is essentially limited to major permit changes. EPA review need not include permits which simply codify elements of a state's overall clean air plan, and EPA has discretion to not review permits for small sources. Holding a permit to some extent shields a source from enforcement actions: the act provides that a source cannot be held in violation if it is complying with explicit requirements addressed in a permit, or if the state finds that certain provisions do not apply to that source.

Enforcement

Section 113 of the act, which was also strengthened by the 1990 amendments, covers enforcement. The section establishes federal authority to issue agency and court orders requiring compliance and to impose penalties for violations of Act requirements. Section 114 authorizes EPA to require sources to submit reports, monitor emissions, and certify compliance with the act's requirements, and authorizes EPA personnel to conduct inspections.

Like most federal environmental statutes, the Clean Air Act is enforced primarily by states or local governments; they issue most permits, monitor compliance, and conduct the majority of inspections. The federal government functions as a backstop, with authority to review state actions. The agency may act independently or may file its own enforcement action in cases where it concludes that a state's response was inadequate.

The act also provides for citizen suits both against persons (including corporations or government agencies) alleged to have violated emissions standards or permit requirements, and against EPA in cases where the administrator has failed to perform an action that is not discretionary under the act. Citizen groups have often used the latter provision to compel the administrator to promulgate regulations required by the statute.

The 1990 Amendments elevated penalties for some knowing violations from misdemeanors to felonies; removed the ability of a source to avoid an enforcement order or civil penalty by ceasing a violation within 60 days of notice; gave authority to EPA to assess administrative penalties; and authorized $10,000 awards to persons supplying information leading to convictions under the act.

Stratospheric Ozone Protection

Title VI of the 1990 Clean Air Act Amendments represents the United States' primary response on the domestic front to the stratospheric ozone depletion issue. It also implements the U.S. international responsibilities under the Montreal Protocol on Substances that Deplete the Ozone Layer (and its amendments). Indeed, Section 606(a)(3) provides that EPA shall adjust phase-out schedules for ozone-depleting substances in accordance with any future changes in Montreal Protocol schedules. As a result, the phase-out schedules contained in Title VI for various ozone-depleting compounds have now been superseded by subsequent amendments to the Montreal Protocol.

Since passage of Title VI, depleting substances such as CFCs, methyl chloroform, carbon tetrachloride, and halons (referred to as Class 1 substances) have been phased out by industrial countries, including the United States. New uses of hydrochlorofluorocarbons (HCFCs) (called Class 2 substances under Title VI) were banned beginning January 1, 2015, unless the HCFCs are recycled, used as a feedstock, or used as a refrigerant for appliances manufactured prior to January 1, 2020. Production of HCFCs is to be frozen January 1, 2015, and phased out by January 1, 2030. Exemptions consistent with the Montreal Protocol are allowed.

EPA is required to add any substance with an ozone depletion potential (ODP) of 0.2 or greater to the list of Class 1 substances and set a phase-out schedule of no more than seven years. For example, methyl bromide (ODP estimated by EPA at 0.7) was added to the list in December 1993, requiring its phaseout by January 1, 2001; this decision was altered by Congress in 1998 to harmonize the U.S. methyl bromide phase-out schedule with the 2005 deadline set by the parties to the Montreal Protocol in 1997. Also, EPA is required to add any substance that is known or may be reasonably anticipated to harm the stratosphere to the list of Class 2 substances and set a phase-out schedule of no more than ten years.

Title VI contains several implementing strategies to avoid releases of ozone-depleting chemicals to the atmosphere, including (1) for Class 1 substances used as refrigerants—lowest achievable level of use and emissions, maximum recycling, and safe disposal required by July 1, 1992; (2) for servicing or disposing refrigeration equipment containing Class 1 and 2 substances—venting banned as of July 1, 1992; (3) for motor vehicle air conditioners containing Class 1 or 2 substances—recycling required by January 1, 1992 (smaller shops by January 1, 1993); (4) sale of small containers of class 1 and 2 substances—banned within two years of enactment; and (5) nonessential products—banned within two years of enactment.

Selected References

U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *Air Trends*. Compiled annually, and available at http://www.epa.gov/airtrends/.

Julie R. Domike and Alec Chatham Zacaroli (eds.), *The Clean Air Act Handbook*, 4th edition (Chicago: American Bar Association) 2016, 864 p.

CRS Report R43699, *Key Historical Court Decisions Shaping EPA's Program Under the Clean Air Act*, by Linda Tsang.

CRS Report R45451, *Clean Air Act Issues in the 116th Congress*, by James E. McCarthy, Kate C. Shouse, and Richard K. Lattanzio.

Table 4. Major U.S. Code Sections of the Clean Air Act

(codified generally as 42 U.S.C. 7401-7671)

42 U.S.C.	Section Title	Clean Air Act, as amended
Subchapter I -	Programs and Activities	
Part A -	Air Quality and Emissions Limitations	
7401	Congressional findings and declaration of purpose	Sec. 101
7402	Cooperative activities	Sec. 102
7403	Research, investigation, training, and other activities	Sec. 103
7404	Research relating to fuels and vehicles	Sec. 104
7405	Grants for support of air pollution planning and control programs	Sec. 105
7406	Interstate air quality agencies; program cost limitations	Sec. 106
7407	Air quality control regions	Sec. 107
7408	Air quality criteria and control techniques	Sec. 108
7409	National primary and secondary ambient air quality standards	Sec. 109
7410	State Implementation Plans for national primary and secondary ambient air quality standards	Sec. 110
7411	Standards of performance for new stationary sources	Sec. 111
7412	Hazardous air pollutants	Sec. 112
7413	Federal enforcement	Sec. 113
7414	Recordkeeping, inspections, monitoring, and entry	Sec. 114
7415	International air pollution	Sec. 115
7416	Retention of state authority	Sec. 116
7417	Advisory committees	Sec. 117
7418	Control of pollution from federal facilities	Sec. 118
7419	Primary nonferrous smelter orders	Sec. 119
7420	Noncompliance penalty	Sec. 120
7421	Consultation	Sec. 121
7422	Listing of certain unregulated pollutants	Sec. 122
7423	Stack heights	Sec. 123
7424	Assurance of adequacy of state plans	Sec. 124
7425	Measures to prevent economic disruption or unemployment	Sec. 125
7426	Interstate pollution abatement	Sec. 126
7427	Public notification	Sec. 127
7428	State boards	Sec. 128
7429	Solid waste combustion	Sec. 129
7430	Emission factors	Sec. 130
7431	Land use authority	Sec. 131

42 U.S.C.	Section Title	Clean Air Act, as amended
Part B - Ozone Protection (repealed—new provisions related to stratospheric ozone protection are found at 42 U.S.C. 7671 et seq., below)		
Part C -	Prevention of Significant Deterioration of Air Quality	
Subpart I -	Clean Air	
7470	Congressional declaration of purpose	Sec. 160
7471	Plan requirements	Sec. 161
7472	Initial classifications	Sec. 162
7473	Increments and ceilings	Sec. 163
7474	Area redesignation	Sec. 164
7475	Preconstruction requirements	Sec. 165
7476	Other pollutants	Sec. 166
7477	Enforcement	Sec. 167
7478	Period before plan approval	Sec. 168
7479	Definitions	Sec. 169
Subpart II -	Visibility Protection	
7491	Visibility protection for federal class I areas	Sec. 169A
7492	Visibility	Sec. 169B
Part D -	Plan Requirements for Nonattainment Areas	
Subpart 1 -	Nonattainment Areas in General	
7501	Definitions	Sec. 171
7502	Nonattainment plan provisions in general	Sec. 172
7503	Permit requirements	Sec. 173
7504	Planning procedures	Sec. 174
7505	Environmental Protection Agency grants	Sec. 175
7505a	Maintenance plans	Sec. 175A
7506	Limitations on certain federal assistance	Sec. 176
7506a	Interstate transport commissions	Sec. 176A
7507	New motor vehicle emission standards in nonattainment areas	Sec. 177
7508	Guidance documents	Sec. 178
7509	Sanctions and consequences of failure to attain	Sec. 179
7509a	International border areas	Sec. 179B
Subpart 2 -	Additional Provisions for Ozone Nonattainment Areas	
7511	Classifications and attainment dates	Sec. 181

42 U.S.C.	Section Title	Clean Air Act, as amended
7511a	Plan submissions and requirements	Sec. 182
7511b	Federal ozone measures	Sec. 183
7511c	Control of interstate ozone air pollution	Sec. 184
7511d	Enforcement for Severe and Extreme Ozone Nonattainment Areas for failure to attain	Sec. 185
7511e	Transitional areas	Sec. 185A
7511f	NO_x and VOC study	Sec. 185B
Subpart 3 -	Additional Provisions for Carbon Monoxide Nonattainment Areas	
7512	Classification and attainment dates	Sec. 186
7512a	Plan submissions and requirements	Sec. 187
Subpart 4 -	Additional Provisions for Particulate Matter Nonattainment Areas	
7513	Classifications and attainment dates	Sec. 188
7513a	Plan provisions and schedules for plan submissions	Sec. 189
7513b	Issuance of RACM and BACM guidance	Sec. 190
Subpart 5 -	Additional Provisions for Areas Designated Nonattainment for Sulfur Oxides, Nitrogen Dioxide, or Lead	
7514	Plan submission deadlines	Sec. 191
7514a	Attainment dates	Sec. 192
Subpart 6 -	Savings Provisions	
7515	General savings clause	Sec. 193
Subchapter II -	Emission Standards for Moving Sources	
Part A -	Motor Vehicle Emission and Fuel Standards	
7521	Emission standards for new motor vehicles or new motor vehicle engines	Sec. 202
7522	Prohibited acts	Sec. 203
7523	Actions to restrain violations	Sec. 204
7524	Civil penalties	Sec. 205
7525	Motor vehicle and motor vehicle engine compliance testing and certification	Sec. 206
7541	Compliance by vehicles and engines in actual use	Sec. 207
7542	Information collection	Sec. 208
7543	State standards	Sec. 209
7544	State grants	Sec. 210

42 U.S.C.	Section Title	Clean Air Act, as amended
7545	Regulation of fuels	Sec. 211
7547	Nonroad engines and vehicles	Sec. 213
7548	Study of particulate emissions from motor vehicles	Sec. 214
7549	High altitude performance adjustments	Sec. 215
7550	Definitions	Sec. 216
7552	Motor vehicle compliance program fees	Sec. 217
7553	Prohibition on production of engines requiring leaded gasoline	Sec. 218
7554	Urban bus standards	Sec. 219
Part B -	Aircraft Emission Standards	
7571	Establishment of standards	Sec. 231
7572	Enforcement of standards	Sec. 232
7573	State standards and controls	Sec. 233
7574	Definitions	Sec. 234
Part C -	Clean Fuel Vehicles	
7581	Definitions	Sec. 241
7582	Requirements applicable to clean-fuel vehicles	Sec. 242
7583	Standards for light-duty clean-fuel vehicles	Sec. 243
7584	Administration and enforcement as per California standards	Sec. 244
7585	Standards for heavy-duty clean-fuel vehicles	Sec. 245
7586	Centrally fueled fleets	Sec. 246
7587	Vehicle conversions	Sec. 247
7588	Federal agency fleets	Sec. 248
7589	California pilot test program	Sec. 249
7590	General provisions	Sec. 250
Subchapter III -	General Provisions	
7601	Administration	Sec. 301
7602	Definitions	Sec. 302
7603	Emergency powers	Sec. 303
7604	Citizen suits	Sec. 304
7605	Representation in litigation	Sec. 305
7606	Federal procurement	Sec. 306
7607	Administrative proceedings and judicial review	Sec. 307
7608	Mandatory licensing	Sec. 308

42 U.S.C.	Section Title	Clean Air Act, as amended
7609	Policy review	Sec. 309
7610	Other authority	Sec. 310
7611	Records and audit	Sec. 311
7612	Economic impact analyses	Sec. 312
7614	Labor standards	Sec. 314
7615	Separability	Sec. 315
7616	Sewage treatment grants	Sec. 316
7617	Economic impact assessment	Sec. 317
7619	Air quality monitoring	Sec. 319
7620	Standardized air quality modeling	Sec. 320
7621	Employment effects	Sec. 321
7622	Employee protection	Sec. 322
7624	Cost of vapor recovery equipment	Sec. 323
7625	Vapor recovery for small business marketers of petroleum products	Sec. 324
7625-1	Exemptions for certain territories	Sec. 325
7625a	Statutory construction	Sec. 326
7626	Authorization of appropriations	Sec. 327
7627	Air pollution from Outer Continental Shelf activities	Sec. 328
Subchapter IV-A	Acid Deposition Control	
7651	Findings and purposes	Sec. 401
7651a	Definitions	Sec. 402
7651b	Sulfur dioxide allowance program for existing and new units	Sec. 403
7651c	Phase I sulfur dioxide requirements	Sec. 404
7651d	Phase II sulfur dioxide requirements	Sec. 405
7651e	Allowances for states with emissions rates at or below 0.80 lbs./mmBtu	Sec. 406
7651f	Nitrogen oxides emission reduction program	Sec. 407
7651g	Permits and compliance plans	Sec. 408
7651h	Repowered sources	Sec. 409
7651i	Election for additional sources	Sec. 410
7651j	Excess emissions penalty	Sec. 411
7651k	Monitoring, reporting, and recordkeeping requirements	Sec. 412
7651l	General compliance with other provisions	Sec. 413
7651m	Enforcement	Sec. 414
7651n	Clean coal technology regulatory incentives	Sec. 415
7651o	Contingency guarantee, auctions, reserve	Sec. 416

42 U.S.C.	Section Title	Clean Air Act, as amended
Subchapter V -	Permits	
7661	Definitions	Sec. 501
7661a	Permit programs	Sec. 502
7661b	Permit applications	Sec. 503
7661c	Permit requirements and conditions	Sec. 504
7661d	Notification to administrator and contiguous states	Sec. 505
7661e	Other authorities	Sec. 506
7661f	Small business stationary source technical and environmental compliance assistance program	Sec. 507
Subchapter VI -	Stratospheric Ozone Protection	
7671	Definitions	Sec. 601
7671a	Listing of class I and class II substances	Sec. 602
7671b	Monitoring and reporting requirements	Sec. 603
7671c	Phase-out of production and consumption of class I substances	Sec. 604
7671d	Phase-out of production and consumption of class II substances	Sec. 605
7671e	Accelerated schedule	Sec. 606
7671f	Exchange authority	Sec. 607
7671g	National recycling and emission reduction program	Sec. 608
7671h	Servicing of motor vehicle air conditioners	Sec. 609
7671i	Nonessential products containing chlorofluorocarbons	Sec. 610
7671j	Labeling	Sec. 611
7671k	Safe alternatives policy	Sec. 612
7671l	Federal procurement	Sec. 613
7671m	Relationship to other laws	Sec. 614
7671n	Authority of administrator	Sec. 615
7671o	Transfers among parties to Montreal Protocol	Sec. 616
7671p	International cooperation	Sec. 617
7671q	Miscellaneous provisions	Sec. 618
[29 U.S.C. 655]	Chemical Process Safety Management	Sec. 304 of CAA of 1990
[29 U.S.C. 1662e]	Clean Air Employment Transition Assistance	Sec.1101 of CAA of 1990

Note: This table shows only the major U.S. Code sections. For more detail and to determine when a section was added, the reader should consult the official printed version of the U.S. Code.

Author Information

Richard K. Lattanzio
Specialist in Environmental Policy

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Prior contributors to this report include James E. McCarthy, Larry B. Parker, Linda-Jo Schierow, Claudia Copeland, and Kate C. Shouse.

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