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# An Overview of the Clean Air Act

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By 1970, with rampant smog alerts and particulate emissions obscuring skylines, it was clear that previous efforts to control air contaminants were not adequate. The Clean Air Act (CAA) of 1970 was the first of the major federal environmental laws.

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The 1970 Clean Air Act launched an ambitious set of federal programs to establish air quality goals and to impose pollution control technology requirements on new and existing stationary sources and on motor vehicles. Major amendments to the CAA enacted in 1977 and 1990 made significant changes to the federal air pollution program, but the core of the program as it existed in 1970 remains the same.

## Overview

The primary goal of the CAA is to achieve national ambient air quality levels protective of public health and welfare by establishing air quality standards and imposing limitations on air pollutant emissions from both stationary and mobile sources. The Environmental Protection Agency (EPA) strives to meet the goals of the CAA through a combination of its own standards and plans developed by the states with EPA oversight.

The Clean Air Act directs EPA to develop primary and secondary national ambient air quality standards (NAAQS) for "criteria pollutants." The primary standards are necessary to protect public health with what EPA calls "an ample margin of safety," while secondary standards are intended to protect against environmental and property damage.

Costs are not allowed to be considered in setting primary standards and are designed to be protective of sensitive sub-populations with continuous exposure. A geographic area that meets the primary standard for a criteria pollutant is called an attainment area," while an area that exceeds the primary standard is called a non-attainment area. EPA has promulgated NAAQS for six criteria pollutants: sulfur dioxide, particulate matter, nitrogen dioxide, carbon monoxide, ozone and lead.

While the CAA establishes NAAQS for the criteria pollutants, OSHA, pursuant to the Occupational Safety & Health Act, promulgates permissible exposure limits (PELs) to protect workers against health effects of exposure to hazardous substances. PELs are regulatory

limits on the amount or concentration of a substance in the work place air, and OSHA has set PELs for all of the criteria pollutants.

### **State Implementation Plans**

EPA sets the NAAQS, but the task of how to achieve these standards is delegated to the individual states. The CAA requires states to prepare and update a state implementation plan (SIP) that ensures that each region within the state will come into compliance with the NAAQS. A state is free, within bounds established by EPA, to develop its own SIP and choose its own regulatory requirements in order to attain the national standards. EPA reviews each SIP and either approves or disapproves the SIP. Should a state fail to prepare a sufficient SIP, EPA must prepare one for it. There are also restrictions on federal highway funds if a state fails to submit an adequate SIP.

Deadlines for achieving NAAQS vary depending on the pollutant and the severity of the non-attainment. By far, the most difficult NAAQS to meet have been standards for ground-level ozone. Moreover, EPA recently tightened ozone standards in a way that will more than double the number of counties in non-attainment. SIPs for ozone have forced changes to low-VOC coatings and solvents, substitution of non-photochemically reactive volatile organic compounds, controls on nitrogen oxide emissions from fuel burning, and various measures to reduce motor vehicle emissions.

### **New Source Performance Standards**

New source performance standards (NSPS) ensure that the best pollution control technology is used by new sources regardless of their locations. EPA issues NSPS, which are federal technology-based requirements for emissions from categories of new or modified stationary sources of air pollution. NSPS apply to any stationary source in an applicable source category constructed after the proposal of NSPS regulations. These standards also apply to any modification of such sources, which is defined as any physical change in the source's method of operation that increases emissions or results in the emission of pollutant not previously emitted. NSPS have been promulgated for generic categories of sources, like boilers and volatile liquid storage tanks, as well as industry-sector-specific processes.

### **National Emission Standards**

The CAA amendments of 1990 require EPA to develop a program to establish national emission standards for hazardous air pollutants (NESHAPS) to protect the public with an ample margin of safety. The act contains a list of 189 hazardous air pollutants from various industries, which EPA must regulate. HAPs include known or suspected carcinogens, reproductive toxins and other harmful compounds. EPA may delete a substance from the list if it has adequate information to conclude that emissions of the substance may not reasonably be anticipated to cause adverse human health or environmental effects.

EPA must develop standards to control hazardous air pollutants from categories of major stationary sources of HAPs, as well as certain area sources. An area source is any source that is not major. For the purpose of regulating HAPs, a major source is defined as a source with the potential to emit 10 tons of any one HAP or 25 tons of any combination of HAPs per year.

Once EPA has identified and listed major and area source categories of HAPs, EPA must promulgate emissions standards for each source category. Major sources are subject to technology-based emission standards or work practices based on the maximum achievable control technology (MACT). EPA is nearing the end of its development of MACT standards, with standards already promulgated for almost 100 source categories. Additionally, within 8 years after promulgating a MACT standard, EPA must assess whether even-more-stringent standards are necessary to assure protection of public health with an ample margin of safety. Such residual risk standards are required, at a minimum, if the maximally exposed individual faces a lifetime cancer risk greater than one in a million.

EPA is also required to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. Through the Risk Management Program Rule, EPA requires companies to develop a risk management plan (RMP) and submit a description of the plan to EPA. The RMP must include a hazard assessment analysis, a program for the prevention of accidental releases, and an emergency response program.

### **New Source Review**

The CAA divides the country into areas that are not yet achieving the NAAQS, or non-attainment areas, and those areas in which air quality is better than the NAAQS, or attainment areas. Regions may be non-attainment for one of the criteria pollutants but not others.

In attainment areas, the Prevention of Significant Deterioration (PSD) program requires that, prior to commencing construction, covered sources demonstrate that their emissions will not cause air quality to deteriorate beyond specified numerical increments or contribute to a violation of any NAAQS and that they will install the best available control technology (BACT). The PSD program applies only to major stationary sources and major modifications of existing major sources. To be considered "major," a source must have a potential to emit any regulated pollutant of at least 250 tons per year (100 tons per year for some source categories). A major modification is defined as any physical change in the method of operation that would result in a specified net emissions increase of any pollutant subject to regulation.

More stringent requirements apply to new major sources or major modifications in non-attainment areas. Depending on the area, a major source may be smaller than 100 tons per year, and a major modification of such a source may be one that produces any increase in emissions. A project that is major and triggers non-attainment New Source Review must use more stringent and costly lowest achievable emission rate (LAER) control technology and must offset new pollution from the source by ensuring reductions of pollution from existing sources.

**Motor vehicle emissions** Emissions from motor vehicles and other mobile sources were the first forms of air pollution subject to national regulation. In order to reduce pollution from mobile sources, the CAA requires refiners to market cleaner fuels; manufacturers to produce cars, trucks, and buses meeting increasingly stringent tailpipe emission standards; establish vehicle inspection and maintenance programs; and EPA to develop regulations for off-road vehicles and equipment.

**Acid rain** The Acid Rain Program establishes provisions to reduce the occurrence of acidification of lakes in the United States and Canada. The main source of acid rain is

**coal-burning power plants. Long-range transport sulfur dioxide and nitrogen oxide emissions results in acid rain and fallout of acidic particulate matter, which enters surface waters directly or through runoff. The Acid Rain Program is a phased approach to cut sulfur dioxide emissions in half and substantially reduce nitrogen oxide emissions from electric utility plants. To achieve these reductions, the program establishes an innovative market-based system. Affected utility units are allocated allowances based on historical fuel consumption and specified emission rates. Each allowance allows a utility to emit one ton of sulfur dioxide, which may be traded, bought and sold. For example, if a plant expects to release more sulfur dioxide than it has allowances, it could either get more allowances by buying them from another power plant, or the plant could reduce its sulfur dioxide emissions.**

### **Operating Permits**

Title V of the 1990 CAA amendments created a national permit system that consolidates all of the requirements of the CAA for a particular source. These permits, often referred to as Title V permits or operating permits, include information such as the pollutants released, how much may be released, and the abatement measures and monitoring methods by the operator to reduce the pollution. Title V permits are required only for certain sources considered major a broader subset than major sources subject to New Source Review.

### **Ozone-Depleting Substances**

The CAA also directs EPA to protect the stratospheric ozone layer. Scientists found holes in the ozone layer and concluded that chlorofluorocarbons (CFCs) were causing that destruction of the ozone layer. As a result, the CAA mandates the phase out of the production and consumption of ozone-depleting substances and authorizes EPA to ban nonessential products containing those substances.

In addition to the phase-out of the production of ozone-depleting chemicals, the CAA requires the recycling of CFCs and labeling of products that contain or were manufactured with ozone-depleting substances. Finally, the CAA encourages the development of ozone-friendly substitutes for the ozone-depleting substances. As these substitutes are developed, EPA must determine whether the replacement will be safe for health and the environment.

### **Noise Pollution**

Pursuant to the CAA, EPA established an Office of Noise Abatement and Control (ONAC) to study the causes and sources of noise and to consult with EPA to determine possible means to abate government noise activity that resulted in a public nuisance. However, in 1982, the Office of Management and Budget and President Ronald Reagan terminated federal funding for the ONAC on the basis that noise pollution was a local problem best left to state regulation. EPA has set some noise standards for equipment; however, its authority is limited.

### **Mercury Reduction Issues**

In the past few years, EPA has placed increasing emphasis on the control of mercury emissions, based on evidence that many people are exposed to levels of mercury that could have adverse health effects, primarily through the consumption of contaminated fish. Concentrations of mercury in the air are usually low and of little direct concern; however,

when mercury enters water, biological processes transform it to a highly toxic form.

A major source of mercury emissions in the ambient air is the burning of fossil fuels. Fallout from these sources deposits in waterways or on land where it can be washed into surface waters. Bacteria in water can cause a chemical change and transforms mercury into methylmercury, a highly toxic form of mercury.

Mercury is considered a HAP, for which MACT standards have been developed. Emissions from certain sources, such as coal-fired electricity generating plants, will be regulated through MACT. EPA is also considering other voluntary or mandatory measures, such as the removal of mercury switches from automobiles and tennis shoe lights.

Also, the administration's proposed "Clear Skies" legislation would create a mandatory program to considerably reduce power-plant emissions of sulfur dioxides, nitrogen oxides and mercury by setting a strict national cap on each pollutant. Opponents of Clear Skies complain that the legislation would not achieve any mercury reductions beyond those that will occur automatically as a result of sulfur dioxide and nitrogen oxide controls, and they urge more ambitious mercury reduction measures.

*Russell S. Frye is a partner in the Environmental Group of Collier, Shannon, Scott, PLLC, a Washington, DC law firm. Frye has practiced environmental law for more than 25 years. Kristina G. Nelson is an associate in the Environmental Group of Collier, Shannon, Scott, PLLC, a Washington, DC law firm. They can be reached at (202) 342-8400.*

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