CHAPTER 1

THE CLEAN AIR ACT AND THE NATIONAL ENVIRONMENTAL POLICY ACT

LEARNING OBJECTIVES

- To understand the history and importance of the Clean Air Act
- To become familiar with the National Ambient Air Quality Standards and how they are created
- To know the requirements of State Implementation Plans
- To understand which air pollutants are hazardous
- To comprehend efforts to protect vital environmental areas and to regulate new sources of pollution

The Clean Air Act is the basic law that frames U.S. environmental policy. This law has seen many versions, beginning in the 1950s with the U.S. Public Health Service (PHS) investigation of the Donora, Pennsylvania, air pollution episode. This investigation found that air pollutants from industrial sources became particularly noxious in a cold air inversion, leading to several dozen deaths directly related to the air pollution. The U.S. PHS investigators related deaths both temporally and etiologically to the air pollution, since most were cardiopulmonary deaths among the elderly. The first air pollution laws primarily funded research for health studies but gradually gave way to federal regulatory efforts that encompassed a unique brand of federalism whereby the states were mandated to carry out the federal regulations in a somewhat cooperative manner. The power to regulate interstate commerce gave the federal government its constitutional mandate, which has been consistently upheld in the courts after industry challenge.

The Clean Air Act

The London Fog and the Donora Fog

The **Clean Air Act (CAA)**, first passed in 1970, is a landmark public law born from public pressure to control smog and air pollution in general. Prior to its enactment, the world experienced some major catastrophic episodes brought about by smog. In particular, the **London Fog** episode in 1952, which killed thousands of people from cardiovascular and pulmonary complications, was due to cold air inversions that increased atmospheric sulfur dioxide, SO_2 and particulate matter (PM). This disaster was preceded by the 1948 Donora, Pennsylvania, air pollution episode (the **Donora Fog**) in which high concentrations of sulfur dioxide, coupled with a temperature inversion and foggy weather, caused twenty people to die due to cardiac and respiratory disease and about half of the town's 12,000 residents to complain of cough, respiratory tract irritation, chest pain, headaches, nausea, and vomiting.[1] The fog was the result of an anticyclone that closed over Donora on the morning of Tuesday, October 26, 1948. Berton Roueché described the event based on eyewitness accounts:

> The weather was raw, cloudy and dead calm, and it stayed that way as the fog piled up all that day and the next. By Thursday, it had stiffened adhesively into a motionless clot of smoke. That afternoon it was just possible to see across the street, and except for the stacks, the mills had vanished. The air began to have a sickening smell, almost a taste. It was the bittersweet reek of sulfur dioxide. Everyone who was out that day remarked on it, but no one was much concerned. The smell of sulfur dioxide, a scratchy gas given off by burning coal

and melting ore, is a normal concomitant of any durable fog in Donora. This time it merely seemed more penetrating than usual.[2]

Early Policy Responses to Air Pollution

The first legislation aimed at controlling air pollution was passed in 1955 as the Air Pollution Control Act (APCA). This was the first federal legislative attempt to control air pollution at its source. It granted $5 million annually for five years for research by the U.S. Public Health Service. The act did little to prevent air pollution, but it made the government aware that the problem existed on the national level. It recognized the dangers facing public health and welfare, agriculture, livestock, and deterioration of property and reserved for Congress the right to control this growing problem. The law, which had been initiated by California's representatives in the Senate and the House, was followed by a number of failed attempts. Air pollution had long been regarded as a local problem, and the federal government was hesitant to interfere with states' rights. As a result, the first APCA was rather narrow in scope and effect.

The First Clean Air Act and Its Amendments

Eight years after passing the APCA, Congress passed the Clean Air Act of 1963.[3] This act dealt with reducing air pollution by setting emissions standards for stationary sources such as power plants and steel mills. It did not take into account mobile sources of air pollution, which had become the largest source of many unhealthy pollutants. Once these standards were set, the government also needed to determine deadlines for companies to comply with them. Amendments to the Clean Air Act were passed in 1965, 1966, 1967, and 1969. These amendments authorized the Secretary of Health, Education, and Welfare (HEW) to set standards for auto emissions, expand local air pollution control programs, establish air quality control regions (AQCR), set air quality standards and compliance deadlines for stationary source emissions, and authorize research on low-emissions fuels and automobiles.

The CAA promoted **federalism** with requirements and aid to the states to implement its provisions. Because air pollutants crossed state boundaries, the federal government played an important role in the CAA's implementation and standardization. Furthermore, the CAA promoted public health with health-based air pollutant standards. It also fostered public welfare, since there were secondary standards to protect agriculture, forests, monuments, visibility, and water bodies from the deleterious effects of air pollution. The U.S. Supreme Court upheld the role of the federal government in regulating air pollution because of its regional and national context under the interstate commerce clause.

By 1970, issues under the CAA had been addressed again by Congress. In 1970, President Richard Nixon established the **Environmental Protection Agency (EPA)** by an executive order. Although important legislative precedents had been set, the existing law and amendments were deemed inadequate. Technically another amendment, the Clean Air Act of 1970 was a major revision and set much more demanding standards. It established new primary and secondary standards for ambient air quality, set new limits on emissions from stationary and mobile sources to be enforced by both state and federal governments, and increased funds for air pollution research. The 1970 amendments 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, and established a program to regulate air toxics. It was soon discovered that the deadlines set were overly ambitious (especially those for auto emissions). To reach these standards in such a short period of time, the auto industry would face serious economic limitations and seemingly insurmountable technological challenges. These issues resulted in the 1977 CAA amendments, which adjusted the auto emission standards, extended the deadlines for the attainment of air quality standards and added the **Prevention of Significant Deterioration program**.

Sen. Edmund Muskie (ME-D) stated that the legislation prioritized public health above technological and economic considerations: ``The first responsibility of Congress is not the making of technological or economic judgments—or even to be limited by what appears to be technologically or economically feasible. Our responsibility is to establish what the public interest requires to protect the health of persons. This may mean that people and industries will be asked to do what seems to be impossible at the present time. But if health is to be protected, these challenges must be met.''

At that time, this was a bipartisan point of view; Republicans also favored the bill in spite of its demands on industry. For instance, Sen. Winston Prouty (VT-R) described the 1970 amendments, stating, ``For the first time, air quality standards will take precedence over objections of economic impracticality and technical impossibilities.'' Congress did not amend the Clean Air Act during the 1980s, in part because President Ronald Reagan's administration placed economic goals ahead of environmental goals.

In 1990, after a lengthy period of inactivity, the federal government believed that they should again revise the CAA due to growing environmental concerns. The Clean Air Act of 1990 addressed five main areas:

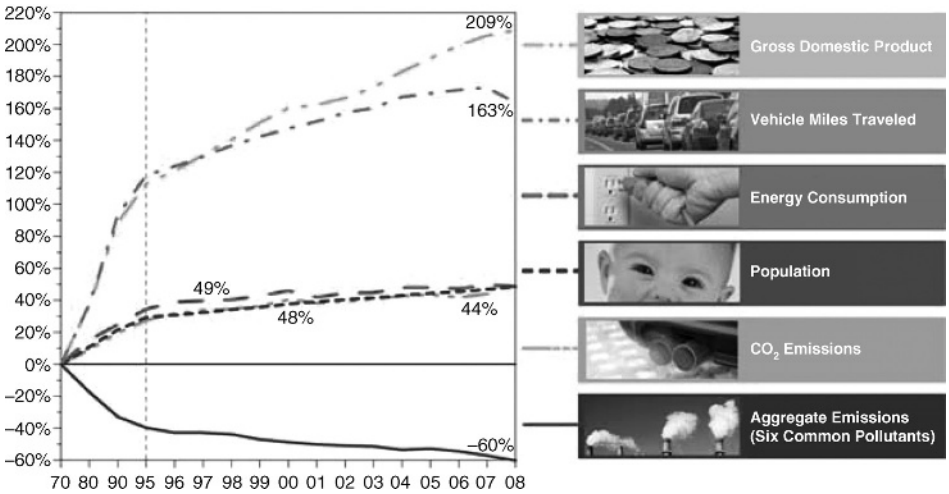
1. It decreased exposure to six so-called **criteria pollutants:** carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), ozone (O_3), particulate matter of 10 microns or less (PM_{10}) and lead (Pb).

2. It limited sources and risks of exposure to 188 enumerated hazardous air pollutants.
3. It prevented significant deterioration of air quality in wilderness areas and national parks.
4. It controlled acid rain.
5. It curbed the use of chemicals that deplete the stratospheric O_3 layer.

The 1990 CAA amendments also included provisions to classify **nonattainment areas** or localities where air pollution levels persistently exceed **National Ambient Air Quality Standards** (Section 1.3) or that contribute to ambient air quality in a nearby area that fails to meet standards. The CAA tailored deadlines, tightened auto and other mobile source emissions standards, required reformulated and alternative fuels in the most polluted areas, established a new program of technology-based standards, required a state-run permit program for the operation of major sources of air pollutants, and updated enforcement provisions, including authority for EPA to assess administrative penalties.

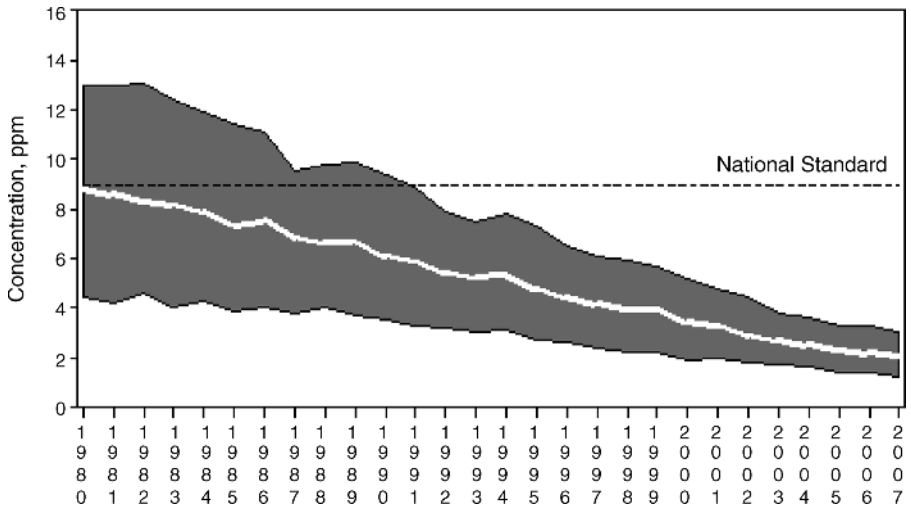
Figure 1.1 illustrates accomplishments of the CAA over the past forty years, and Figure 1.2 illustrates progress in controlling CO. However, the challenges of reducing O_3 pollution continue, Figure 1.3 demonstrates. The Clean Air Act is authorizing legislation and may include authorized appropriations for clean air

FIGURE 1.1 Comparison of growth areas and emissions, 1970–2008



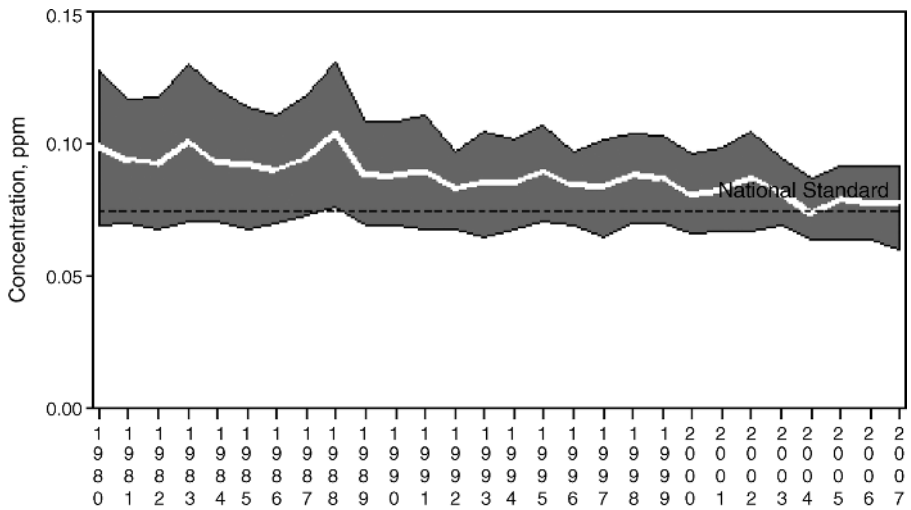
Source: The Environmental Protection Agency.

FIGURE 1.2 CO air quality, 1980–2007



Note: There was a 75% decrease in national average.
Source: The Environmental Protection Agency.

FIGURE 1.3 Ozone air quality, 1980–2007



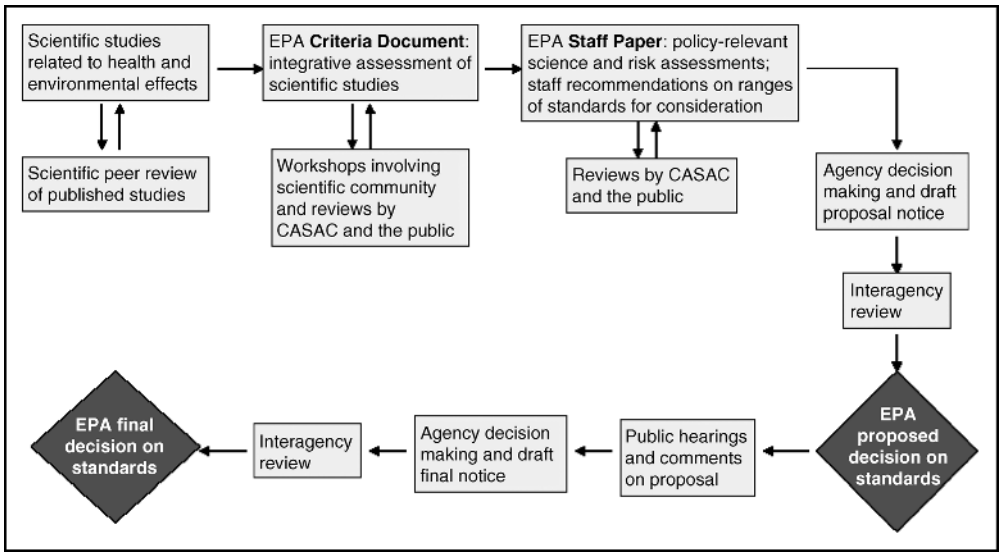
Note: There was only a 21% decrease in the national average. The CAA has been very successful in reducing some criteria such as CO whereas others such as ozone are more intractable.
Source: The Environmental Protection Agency.

programs for a period of time after which they need to be reauthorized. House rules require enactment of an authorization before an appropriation bill can be considered, but this requirement can be waived and frequently has been. The act's legal authorities to issue and enforce regulations are considered to be permanent and do not need reauthorization.

National Ambient Air Quality Standards

Title 1 of the CAA 1970 amendments established National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. These pollutants included CO, NO_2, SO_2, total suspended particulates (that became (PM_{10}) in 1987 and $PM_{2.5}$ in 1997), hydrocarbons (removed in 1983), oxidants (became O_3 in 1979), and Pb (since 1976). The NAAQS were designed to protect public health and welfare with an adequate margin of safety. The CAA requires the EPA to review the scientific data upon which the standards are based and revise the standards, if necessary, every five years. The EPA has been increasingly challenged in meeting this five-year review. The Office of Research Development prepares a criteria document summarizing the research

FIGURE 1.4 Air quality changes from 2007 ozone rollbacks



Source: The Environmental Protection Agency.

and implications for regulation using various standards. The Office of Air Quality Planning and Standards uses the EPA staff to prepare a staff paper listing all of the health-related research papers that are relevant to the standard-setting process. These often number more than 2,000 and result in a voluminous staff paper. The staff paper is an evaluative document that assesses the implications for standard setting of information in the criteria document and presents staff recommendations for NAAQS decision making.

The 1970 CAA amendments authorized the National Institute for Environmental Sciences to conduct air pollution research including toxicology, air pollutant measurement and characterization, animal studies, clinical and translational studies, and epidemiological studies. Also, the EPA has funded air pollution research through their Science to Achieve Results (STAR) grant program and centers like their Particulate Matter Center grants. The EPA also shares funding with industries with a stake in air pollution control at the Health Effects Institute (HEI) based in Boston. HEI has a research committee that reviews all applications and a review committee that reviews the results and final reports prior to publication as HEI documents. These funding agencies provide resources for air pollution scientists to conduct research that provides the science behind the regulatory framework. These appropriations provide material support to scientists, establish a cadre of experts, and train future researchers through graduate programs and postdoctoral fellowships.

The federal regulatory agencies have considerable leeway in developing and enforcing standards. During the past eight years, standard setting has slowed, and much of the NAAQS' work has been done under court order, whereby environmental organizations have sued the EPA for missing deadlines or failing to regulate. The presidential budget may curtail agency activities by reducing or eliminating budget items, or Congress can increase or decrease appropriation. More interesting is the regulatory strategy to justify not regulating. The EPA under the administration of George W. Bush decided that CO_2 was not covered under the CAA, and after losing litigation on this interpretation at the Supreme Court, decided to publish a lengthy Advanced Notice of Proposed Rule-Making trying to justify not regulating. It stated explicitly that the CAA was not the proper law to do this. It used the CAA NAAQS, whereby any emitter of more than 250 tons of primary pollutant would have to be regulated. With this interpretation, most buildings would need to comply, resulting in every conservative organization decrying the expansion of big government. The agency, however, could take a targeted approach and focus on coal-fired power plants, for example, where there would be a huge benefit with less cost. The regulatory process allows many entry points for citizens or organizations to write letters on proposed regulations, present data to CASAC meetings, or even petition the

administrator directly. These efforts are best made through organizations that have standing such as the American Lung Association or American Thoracic Society.

Clean Air Scientific Advisory Committee

The **Clean Air Scientific Advisory Committee (CASAC)** reviews both the criteria document and the staff paper and adds its own critique. The CASAC takes public testimony of these documents and digests their findings and that of the primary literature before recommending a range of standards for the EPA administrator to consider. The EPA administrator has the authority to ignore or accept their recommendations. The CASAC must have a physician, an individual with expertise on air pollution measurement, and a representative from the state air pollution bureaus. Executive Order 12866 requires the EPA to prepare regulatory impact analyses. Cost and technological feasibility cannot be considered in setting NAAQS, but costs and benefits can be considered in developing control strategies. The EPA must submit the regulatory impact analyses to the Office of Management and Budget for review.

State Implementation Plans

While the CAA authorizes the EPA to set NAAQS, the states are responsible for establishing procedures to attain and maintain the standards. The states adopt plans known as **State Implementation Plans (SIPs)** and submit them to the EPA to ensure that they meet statutory requirements. SIPs are based on emission inventories and computer models to determine whether air quality violations will occur. States must develop monitoring plans for air pollution levels; these may be funded by the EPA. If the SIP shows that standards may be exceeded, the state may be required to impose additional controls on existing sources. Proposed new and modified sources must obtain state construction permits in which the applicant has to show that anticipated emissions will not exceed allowable limits. Three years after EPA implements final NAAQS rule designations, states are required to submit SIPs to EPA that detail how areas will be brought into attainment. EPA reviews the SIPs to determine their adequacy to meet statutory requirements and achieve attainment of the standards.

If states do not meet the requirements of NAAQS, the federal government seeks to attain compliance in a number of ways. First, in nonattainment areas, emissions from new or modified sources must also be offset by reductions in emissions from existing sources. Second, EPA can impose a 2-to-1 emissions

offset within eighteen months for the construction of new polluting sources in states where the SIP is inadequate and can impose a ban on most federal highway grants six months later. An additional ban on air quality grants is discretionary, and ultimately, a Federal Implementation Plan may be imposed if the state fails to submit or implement an adequate SIP.

SIPs and Transportation

Demonstrating conformity of transportation plans and SIPs is required in nonattainment areas at least every three years. Nonattainment plans must provide for implementation of all reasonable available control measures. Control technology guidelines exist, for example, the SIP may designate HOV (high occupancy vehicle) lanes on highways to encourage carpooling, or SIPs may increase the number of vehicle inspections to monitor air pollution. Title II on mobile sources contains procedures for setting emissions standards for cars, trucks, off-road vehicles, lawn mowers, chain saws, construction vehicles, locomotives, and marine motors, in order to control CO, VOCs (volatile organic compounds), NOx (NO and NO_2), and O_3. The 1990 CAA amendments reduced the automobile standard for hydrocarbons by 40% and NOx by 50%. A 2001 EPA rule for heavy duty vehicles required a 90% reduction in PM_{10} by 2007 and NOx by 2010. For ozone, nonattainment requirements were assessed to ninety-seven areas, with only Los Angeles categorized as ``Extreme,'' with goals to be set for attainment of a one-hour level of 0.12 ppm by 2010. These goals have been updated by the 0.08 standard for ozone over eight hours, the updated standard of 0.075, and the pending review of this level by the administrator of the EPA. In addition, several iterations of requirements were set for gasoline formulation: first methyl tert butyl ether (MTBE) was favored, but after this additive was noted to contaminate ground water, this high oxygen standard was replaced with ethanol, a renewable fuel. Lead was removed from gasoline in 1990 and sulfur content was further restricted by more than 90% by 2004.

Section 209(b) of the CAA granted California the authority to develop its own vehicle standards as long as they are at least as stringent as federal standards. Section 177 allows other states to adopt California's stricter standards; New York, Maine, Massachusetts, and Vermont have done so.

Permit Requirements

The 1990 amendments to the CAA added Title V, which required states to administer a comprehensive permit program for the operation of sources emitting air pollutants. Sources subject to the permit requirements generally included

those that emit 100 tons per year of any regulated pollutant; however, in nonattainment areas, the permit requirements may also include sources of VOCs as low as 10 tons per year. States collect annual fees to cover the costs of the permits and their air pollution control programs. The permit defines how much of which air pollutants a source is allowed to emit. As part of the permit process, a source must prepare a compliance plan and certify compliance. State and local governments enforce the CAA. They issue most permits, monitor compliance, and conduct the majority of inspections. The CAA also provides for citizen suits both against persons and corporations alleged to have violated emissions standards or permit requirements. There may also be claims against EPA in cases where the administrator has failed to perform an action that is not discretionary under the CAA. The EPA has authority to assess administrative penalties, charge violators with felonies in some instances rather than misdemeanors, and pay $10,000 awards to persons supplying information leading to convictions under the CAA.

Hazardous Air Pollutants

Section 112 in the 1990 amendments established a program for protecting the public health and environment from exposure to toxic air pollutants. Under this section, EPA was required to establish **Maximum Achievable Control Technology (MACT)** standards for 188 pollutants and to specify categories of sources subject to regulations. The second major provision directed EPA to set health-based standards to address situations in which a significant residual risk of adverse health effects remained after installation of MACT. Third, EPA was to establish standards for stationary ``area sources'' that were responsible for 90% of the emissions of hazardous air pollutants (HAPs). Last, EPA was to establish a Chemical Safety and Hazard Investigation Board to investigate accidents involving releases of hazardous substances. Owners and operators had to prepare risk management plans including hazard assessments, measures to prevent releases, and response programs.

During 1993 in the United States, 3.7 metric tons of air toxics were emitted, with 41% derived from mobile sources, 35% from area sources, and 24% from local stationary sources. Taking into account the health and risk information and the extent of human exposure and toxicity, EPA has considered twenty-one mobile source air toxics (MSATs). These include acetaldehyde, benzene, formaldehyde, 1,3-Butadiene, acrolein, polycyclic aromatic hydrocarbons, diesel, arsenic, chromium, dioxin/furan, ethyl benzene, n-hexane, lead, manganese, mercury, MTBE, naphthalene, nickel, styrene, toluene, and

xylene. Funding for the HAPS program has been inadequate with the EPA having few resources to accomplish a HAPS regulatory program resulting in the inspector general of the EPA releasing a critical report in 2010. The Inspector General Act of 1978 provides an executive oversight of federal agencies' performance, especially to legal mandates required by congressional authorizing legislation.

New Source Performance Standards

Section 111 of the CAA requires EPA to establish nationally uniform technology-based standards, for categories of new industrial facilities that would prevent dirty industries from locating in states or communities with lax standards. The standards also set up the new source review (NSR) to apply to modifications of existing facilities but left ambiguities as to what was a modification as opposed to routine maintenance of a facility. ``Routine maintenance'' to cover investments up to 20% of the value of the facility was exempted from NSR. NSR was to apply particularly to nonattainment areas.

Prevention of Significant Deterioration

The Prevention of Significant Deterioration 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. Class I areas are wilderness areas and national parks; allowable increments of new pollution in these areas would be very small. Class II areas are all attainment areas (areas considered to have air quality as good as or better than the NAAQS), and Class III are slated for development but not to exceed the NAAQS. Visibility is primarily affected by ozone, NOx, and PM, which is described as regional haze, especially in Grand Canyon and Great Smoky Mountains national parks. The 1990 amendments to the CAA established 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. The amendments specifically mention a requirement that states impose best available retrofit technology on existing sources of emissions impairing visibility. The EPA promulgated in 1999 the Regional Haze Rule, which established a sixty-five-year program to return 156 national parks and wilderness areas to their natural visibility conditions (baseline 2000–2004 to natural visibility conditions by 2065).

Clean Air Interstate Quality Rule

In 2004, EPA proposed the **Clean Air Interstate Quality Rule (CAIR)** to reduce interstate transport of fine PM and ozone by focusing on twenty-eight states and the District of Columbia that contributed to downwind states in nonattainment of these NAAQS. The EPA proposed a model cap and trade program for SO_2 and NOx, compounds that contribute to PM and ozone. These efforts were aimed at power plants in phased reductions for 2010 and 2015. EPA monitoring showed that numerous counties were in violation of $PM_{2.5}$ and ozone annual standards across the eastern United States due to regional contributions from sources distant to these areas. EPA proposed a regional emissions cap on SO_2 of 3.9 million tons together with a NOx emissions cap of 1.6 million tons by 2010, and 2.7 million tons for SO_2 and 1.3 million tons for NOx by 2015 (70% and 60% reductions from 2003 respectively). In 2008, this rule was struck down by the U.S. Court of Appeals for the D.C. Circuit because it considered the rule fatally flawed due to regional caps rather than a state-by-state approach. With appeals from environmentalists, the EPA, some utilities, and state air regulators, the court reinstated the rule at the end of 2008 with the understanding that this would be revised to meet the court's objections. In 2010 the EPA promulgated the transport rule that would target power plant pollution in thirty-one eastern states and the District of Columbia. EPA estimated that the rule would cost $2.8 billion to implement and would result in $120–$290 billion in benefits—largely from improvements in respiratory health. When fully implemented in 2014, the rule would improve public health by avoiding 14,000 to 36,000 premature deaths; 21,000 cases of acute bronchitis; 23,000 nonfatal heart attacks; 26,000 hospital and emergency room visits; 1.9 million days of missed work or school; 240,000 cases of aggravated asthma; and worsening of 440,000 upper and lower respiratory symptoms. The transport rule would reduce SO_2 emissions by 71% over 2005 levels by 2014, and NOx emissions by 52%. The Cross-State Air Pollution Rule (CSAPR) was finalized July 7, 2011.

The National Environmental Policy Act

In addition to the Clean Air Act, the **National Environmental Policy Act (NEPA)** was the other key law emanating from the environmental movement of the 1960s and 1970s. Rachel Carson had published *Silent Spring*, discussing how DDT and other pesticides had entered the environment, for example, causing thinning of the egg shells of the bald eagle and preventing hatching of the chicks. Bald eagles became rare in the United States, and other song birds were

threatened. Many years later, EPA's main meeting hall has been named the Rachel Carson Great Room. Senator Gaylord Nelson began the Earth Day celebrations in April 22, 1970, highlighting the environmental threats and crises on the horizon.

The National Environmental Policy Act was signed into law in 1969 with the following purposes:

- To declare a national policy that will encourage productive and enjoyable harmony between man and his environment
- To promote efforts that will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humans
- To enrich the understanding of the ecological systems and natural resources important to the nation, and
- To establish a Council on Environmental Quality

NEPA created the environmental impact statement (EIS), in which the responsible official has to report on the environmental impact of the proposed action, any adverse environmental effects that cannot be avoided, alternatives to the proposed action, and the relationship between local short-term uses of humans' environment and long-term productivity, and any irreversible commitments of resources. This was a major change in placing environmental harm up to the level of cost-benefit ratios for proceeding with governmental projects. It created a federal Council on Environmental Quality (CEQ) ostensibly to coordinate environmental actions among federal agencies. The CEQ was to prepare regulations for the EIS, prepare an annual report, and coordinate federal environmental activities. The annual report was an incredible compendium of environmental data and actions, but it was terminated after the Republican takeover of Congress in 1997 by Newt Gingrich when he orchestrated passage of the Federal Reports Sunset law. No further annual reports of federal environmental agencies' work were issued after 1997.

If the federal action was not major, an environmental assessment (EA) could be issued rather than a full EIS. In 2006 there were 542 EISs: the U.S. Forest Service had the most at 144; this was probably because of logging and road activities. Others were the U.S. Army Corps of Engineers with 56, the Federal Energy Regulatory Committee with 32, the Bureau of Land Management with 42, the National Park Service with 34, and the Federal Highway Administration with 66.

A natural extension of the EIS is the use of health impact assessments (HIA) to examine the effects that a policy, program, or project may have on the health of a population.[4] HIAs offer great potential for promoting health by

encouraging decisions that protect and enhance health and health equity. Major transportation projects may consider the health effects of air pollution or injury prevention, but the influence of road design on physical activity and obesity are often not considered. A bicycle lane may thus be considered. Educational HIAs could promote walking to school and avoiding areas of intense air pollution or noise. The Bureau of Land Management considered the health of Native populations in redesigning their EIS for the Northeast National Petroleum Reserve in Alaska, withdrawing some land from leasing for oil and gas development and instituting new pollution monitoring controls. HIAs are also used by local and state governments encouraging proactive decisions and planning to improve the public's health.

Summary

The Clean Air Act is the monumental environmental law that focuses Americans' attention on the environment. It provides for science-based regulation for clean air, especially ozone and particulate matter. These regulations are carried out by states, and they implement policy to control pollution from stationary sources such as power plants and transportation sources. The Environmental Protection Agency has implemented special programs for diesel engines, new source pollution attainment, prevention of air deterioration in pristine areas, and integration with multiple pollutants. In celebration of its fortieth anniversary, EPA Administrator Lisa Jackson stated that in 2010 alone, the Clean Air Act NAAQS for fine particulate and ozone had prevented more than 160,000 cases of premature mortality, 130,000 heart attacks, 13 million lost work days, and 1.7 million asthma attacks. The National Environmental Policy Act turns attention to land and water where activities of the federal government must consider adverse environmental impacts before embarking on such activities.

Key Terms

Clean Air Act (CAA)
Clean Air Interstate Quality Rule (CAIR)
Clean Air Scientific Advisory Committee (CASAC)
Criteria pollutants
Donora Fog
Environmental Protection Agency (EPA)
Federalism

London Fog
Maximum Achievable Control Technology (MACT)
National Ambient Air Quality Standards (NAAQS)
National Environmental Policy Act (NEPA)
Nonattainment areas
Prevention of Significant Deterioration program
State Implementation Plans (SIPS)

Discussion Questions

1. What are the major provisions of the Clean Air Act?
2. What are National Ambient Air Quality Standards and how are they created?
3. What are the requirements of state implementation plans?
4. Which pollutants are considered especially hazardous?
5. What are New Source Performance Standards?
6. How is the government attempting to stop the deterioration of protected areas?

The author thanks Daniel Greenbaum for permission to use parts of the Clean Air Act chapter published in *Environmental and Occupational Medicine*, 4th ed., by Lippincott, Williams and Wilkins.