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Acid Rain

Air pollution produced when acid chemicals are incorporated into rain, snow, fog or mist. The "acid" in acid rain comes from sulfur oxides and nitrogen oxides, products of burning coal and other fuels and from certain industrial processes. The sulfur oxides and nitrogen oxides are related to two strong acids: sulfuric acid and nitric acid. When sulfur dioxide and nitrogen oxides are released from power plants and other sources, winds blow them far from their source. If the acid chemicals in the air are blown into areas where the weather is wet, the acids can fall to Earth in the rain, snow, fog or mist. In areas where the weather is dry, the acid chemicals may become incorporated into dusts or smokes. Acid rain can damage the environment, human health, and property.

Alternative Fuels

Fuels that can replace ordinary gasoline. Alternative fuels may have particularly desirable energy efficiency and pollution reduction features. Alternative fuels include compressed natural gas, alcohols, liquefied petroleum gas (LPG), and electricity. The 1990 Clean Air Act encourages development and sale of alternative fuels.

Attainment Area

A geographic area in which levels of a criteria air pollutant meet the health-based primary standard (national ambient air quality standard, or NAAQS) for the pollutant. An area may have on acceptable level for one criteria air pollutant, but may have unacceptable levels for others. Thus, an area could be both attainment and no attainment at the same time. Attainment areas are defined using federal pollutant limits set by the Environmental Protection Agency (EPA).

Carbon Monoxide (CO)

A colorless, odorless, poisonous gas, produced by incomplete burning of carbon-based fuels, including gasoline, oil, and wood. Carbon monoxide is also produced from incomplete combustion of many natural and synthetic products. For instance, cigarette smoke contains carbon monoxide. When carbon monoxide gets into the body, the carbon monoxide combines with chemicals in the blood and prevents the blood from bringing oxygen to cells, tissues and organs. The body's parts need oxygen for energy, so high-level exposures to carbon monoxide can cause serious health effects, with death possible from massive exposures. Symptoms of exposure to carbon monoxide can include vision problems, reduced alertness, and general reduction in mental and physical functions. Carbon

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monoxide exposures are especially harmful to people with heart, lung, and circulatory system diseases.

CFCs (Chlorofluorocarbons)

These chemicals and some related chemicals have been used in great quantities in industry, for refrigeration and air conditioning, and in consumer products. CFCs and their relatives, when released into the air, rise into the stratosphere, a layer of the atmosphere high above the Earth. In the stratosphere, CFCs and their relatives take part in chemical reactions that result in reduction of the stratospheric ozone layer, which protects the Earth's surface from harmful effects of radiation from the sun. The 1990 Clean Air Act includes provisions for reducing releases (emissions) and eliminating production and use of these ozone-destroying chemicals.

Clean Air Act

The original Clean Air Act was passed in 1963, but our national air pollution control program is actually based on the 1970 version of the law. The 1990 Clean Air Act Amendments are the most far-reaching revisions of the 1970 law. In this summary, we refer to the 1990 amendments as the 1990 Clean Air Act.

Clean Fuels

Low-pollution fuels that can replace ordinary gasoline. These are alternative fuels, including gasohol (gasoline-alcohol mixtures), natural gas and LPG (liquefied petroleum gas).

Combustion

Burning. Many important pollutants, such as sulfur dioxide, nitrogen oxides, and particulates (PM-10) are combustion products, often products of the burning of fuels such as coal, oil, gas and wood.

Continuous Emission Monitoring Systems (CEMS)

Machines that measure, on a continuous basis, pollutants released by a source. The 1990 Clean Air Act requires continuous emission monitoring systems for certain large sources.

Control Technology; Control Measures

Equipment, processes or actions used to reduce air pollution. The extent of pollution reduction varies among technologies and measures. In general, control technologies and measures that do the best job of reducing pollution will be required in the areas with the worst pollution. For example, the best

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available control technology/best available control measures (BACT, BACM) will be required in serious non attainment areas for particulates, a criteria air pollutant. A similar high level of pollution reduction will be achieved with maximum achievable control technology (MACT), which will be required for sources releasing hazardous air pollutants.

Criteria Air Pollutants

A group of very common air pollutants regulated by EPA on the basis of criteria (information on health and/or environmental effects of pollution). Criteria air pollutants are widely distributed all over the country.

Curtailement Programs

Restrictions on operation of fireplaces and woodstoves in areas where these home heat sources make major contributions to pollution.

Emission

Release of pollutants into the air from a source. We say sources emit pollutants. Continuous emission monitoring systems (CEMS) are machines that some large sources are required to install, to make continuous measurements of pollutant release.

Enforcement

The legal methods used to make polluters obey the Clean Air Act. Enforcement methods include citations of polluters for violations of the law (citations are much like traffic tickets), fines and even jail terms. EPA and the state and local governments are responsible for enforcement of the Clean Air Act, but if they don't enforce the law, members of the public can sue EPA or the states to get action. Citizens can also sue violating sources, apart from any action EPA or state or local governments have taken. Before the 1990 Clean Air Act, all enforcement actions had to be handled through the courts. The 1990 Clean Air Act gave EPA authority so that, in some cases, EPA can fine violators without going to court first. The purpose of this new authority is to speed up violating sources' compliance with the law and reduce court time and cost.

Hazardous Air Pollutants (HAPs)

Chemicals that cause serious health and environmental effects. Health effects include cancer, birth defects, nervous system problems and death due to massive accidental releases such as occurred at

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the pesticide plant in Bhopal, India. Hazardous air pollutants are released by sources such as chemical plants, dry cleaners, printing plants, and motor vehicles (cars, trucks, buses, etc.)

Inspection and Maintenance Program (I/M Program)

Auto inspection programs are required for some polluted areas. These periodic inspections, usually done once a year or once every two years, check whether a car is being maintained to keep pollution down and whether emission control systems are working properly. Vehicles that do not pass inspection must be repaired. As of 1992, 111 urban areas in 35 states already had I/M programs. Under the 1990 Clean Air Act, some especially polluted areas will have to have enhanced inspection and maintenance programs, using special machines that can check for such things as how much pollution a car produces during actual driving conditions.

International Air Pollution

Canada and Mexico, the United States' neighbors, share the air at our borders. Pollution moves across the national borders; this international pollution can be serious. The 1990 Clean Air Act includes provisions for cooperative efforts to reduce pollution that originates in one country and affects another.

Interstate Air Pollution

In many areas, two or more states share the same air. We say these states are in the same air basin defined by geography and wind patterns. Often, air pollution moves out of the state in which it is produced into another state. Some pollutants, such as the power plant combustion products that cause acid rain, may travel over several states before affecting health, the environment and property. The 1990 Clean Air Act includes many provisions, such as interstate compacts, to help states work together to protect the air they share. Reducing interstate air pollution is very important since many Americans live and work in areas where more than one state is part of a single metropolitan area.

Material Safety Data Sheets (MSDS)

Product safety information sheets prepared by manufacturers and marketers of products containing toxic chemicals. These sheets can be obtained by requesting them from the manufacturer or marketer. Some stores, such as hardware stores, may have material safety data sheets on hand for products they sell.

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Mobile Sources

Moving objects that release pollution; mobile sources include cars, trucks, buses, planes, trains, motorcycles and gasoline-powered lawn mowers. Mobile sources are divided into two groups: road vehicles, which include cars, trucks and buses, and non-road vehicles, which includes trains, planes and lawn mowers.

Monitoring (Monitor)

Measurement of air pollution is referred to as monitoring. EPA, state and local agencies measure the types and amounts of pollutants in community air. The 1990 Clean Air Act requires certain large polluters to perform enhanced monitoring to provide an accurate picture of their pollutant releases. Enhanced monitoring programs may include keeping records on materials used by the source, periodic inspections, and installation of continuous emission monitoring systems (CEMS). Continuous emission monitoring systems will measure, on a continuous basis, how much pollution is being released into the air. The 1990 Clean Air Act requires states to monitor community air in polluted areas to check on whether the areas are being cleaned up according to schedules set out in the law.

Nitrogen Oxides (NO_x)

A criteria air pollutant. Nitrogen oxides are produced from burning fuels, including gasoline and coal. Nitrogen oxides are smog formers, which react with volatile organic compounds to form smog. Nitrogen oxides are also major components of acid rain.

No Attainment Area

A geographic area in which the level of a criteria air pollutant is higher than the level allowed by the federal standards. A single geographic area may have acceptable levels of one criteria air pollutant but unacceptable levels of one or more other criteria air pollutants; thus, an area can be both attainment and no attainment at the same time. It has been estimated that 60% of Americans live in no attainment areas.

Offset

A method used in the 1990 Clean Air Act to give companies that own or operate large (major) sources in no attainment areas flexibility in meeting overall pollution reduction requirements when changing production processes. If the owner or operator of the source wishes to increase release of a criteria air pollutant, an offset (reduction of a somewhat greater amount of the same pollutant) must be obtained either at the same plant or by purchasing offsets from another company.

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Oxygenated Fuel (Oxy-Fuel)

Special type of gasoline, which burns more completely than regular gasoline in cold start conditions; more complete burning results in reduced production of carbon monoxide, a criteria air pollutant. In some parts of the country, carbon monoxide release from cars starting up in cold weather makes a major contribution to pollution. In these areas, gasoline refiners must market oxygenated fuels, which contain higher oxygen content than regular gasoline. Some gasoline companies started selling oxy-fuels in cities with carbon monoxide problems before the 1990 Clean Air Act was passed.

Ozone

A gas, which is a variety of oxygen. The oxygen gas found in the air consists of two oxygen atoms stuck together; this is molecular oxygen. Ozone consists of three oxygen atoms stuck together into an ozone molecule. Ozone occurs in nature; it produces the sharp smell you notice near a lightning strike. High concentrations of ozone gas are found in a layer of the atmosphere — the stratosphere — high above the Earth. Stratospheric ozone shields the Earth against harmful rays from the sun, particularly ultraviolet B. Smog's main component is ozone; this ground-level ozone is a product of reactions among chemicals produced by burning coal, gasoline and other fuels, and chemicals found in products including solvents, paints, hairsprays, etc.

Ozone Hole

Thin place in the ozone layer located in the stratosphere high above the Earth. Stratospheric ozone thinning has been linked to destruction of stratospheric ozone by CFCs and related chemicals. The 1990 Clean Air Act has provisions to reduce and eliminate ozone destroying chemicals' production and use. Ozone holes have been found above Antarctica and above Canada and northern parts of the United States, as well as above northern Europe.

Particulates Particulate Matter (PM-10)

A criteria air pollutant. Particulate matter includes dust, soot and other tiny bits of solid materials that are released into and move around in the air. Particulates are produced by many sources, including burning of diesel fuels by trucks and buses, incineration of garbage, mixing and application of fertilizers and pesticides, road construction, industrial processes such as steel making, mining operations, agricultural burning (field and slash burning), and operation of fireplaces and woodstoves. Particulate pollution can cause eye, nose and throat irritation and other health problems.

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Permit

A document that resembles a license, required by the Clean Air Act for big (major) sources of air pollution, such as power plants, chemical factories and, in some cases, smaller polluters. Usually permits will be given out by states, but if EPA has disapproved part or all of a state permit program, EPA will give out the permits in that state. The 1990 Clean Air Act includes requirements for permit applications, including provisions for members of the public to participate in state and EPA reviews of permit applications. Permits will have, in one place, information on all the regulated pollutants at a source. Permits include information on which pollutants are being released, how much the source is allowed to release, and the program that will be used to meet pollutant release requirements. Permits are required both for the operation of plants (operating permits) and for the construction of new plants. The 1990 Clean Air Act introduced a nationwide permit system for air pollution control.

Permit Fees

Fees paid by businesses required to have a permit. Permit fees are like the fees drivers pay to register their cars. The money from permit fees will help pay for state air pollution control activities.

Pollutants (Pollution)

Unwanted chemicals or other materials found in the air. Pollutants can harm health, the environment and property. Many air pollutants occur as gases or vapors, but some are very tiny solid particles: dust, smoke or soot.

Primary Standard

A pollution limit based on health effects. Primary standards are set for criteria air pollutants.

Reformulated Gasoline

Specially refined gasoline with low levels of smog-forming volatile organic compounds (VOCs) and low levels of hazardous air pollutants. The 1990 Clean Air Act requires sale of reformulated gasoline in the nine smoggiest areas. Reformulated gasolines were sold in several smoggy areas even before the 1990 Clean Air Act was passed.

Secondary Standard

A pollution limit based on environmental effects such as damage to property, plants, visibility, etc. Secondary standards are set for criteria air pollutants.

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Smog

A mixture of pollutants, principally ground-level ozone, produced by chemical reactions in the air involving smog-forming chemicals. A major portion of smog-formers comes from burning of petroleum-based fuels such as gasoline. Other smog-formers, volatile organic compounds, are found in products such as paints and solvents. Smog can harm health, damage the environment and cause poor visibility. Major smog occurrences are often linked to heavy motor vehicle traffic, sunshine, high temperatures and calm winds or temperature inversion (weather condition in which warm air is trapped close to the ground instead of rising). Smog is often worse away from the source of the smog-forming chemicals, since the chemical reactions that result in smog occur in the sky while the reacting chemicals are being blown away from their sources by winds.

Source

Any place or object from which pollutants are released. A source can be a power plant, factory, dry cleaning business, gas station or farm. Cars, trucks and other motor vehicles are sources, and consumer products and machines used in industry can be sources too. Sources that stay in one place are referred to as stationary sources; sources that move around, such as cars or planes, are called mobile sources.

State Implementation Plan (SIP)

A detailed description of the programs a state will use to carry out its responsibilities under the Clean Air Act. State implementation plans are collections of the regulations used by a state to reduce air pollution. The Clean Air Act requires that EPA approve each state implementation plan. Members of the public are given opportunities to participate in review and approval of state implementation plans.

Stationary Source

A place or object from which pollutants are released and which does not move around. Stationary sources include power plants, gas stations, incinerators, houses etc.

Stratosphere

Part of the atmosphere, the gases that encircle the Earth. The stratosphere is a layer of the atmosphere 9-31 miles above the Earth. Ozone in the stratosphere filters out harmful sunrays, including a type of sunlight called ultraviolet B, which has been linked to health and environmental damage.

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Sulfur Dioxide

A criteria air pollutant. Sulfur dioxide is a gas produced by burning coal, most notably in power plants. Some industrial processes, such as production of paper and smelting of metals, produce sulfur dioxide. Sulfur dioxide is closely related to sulfuric acid, a strong acid. Sulfur dioxide plays an important role in the production of acid rain.

Temperature Inversion

One of the weather conditions that is often associated with serious smog episodes in some portions of the country. In a temperature inversion, air doesn't rise because it is trapped near the ground by a layer of warmer air above it. Pollutants, especially smog and smog-forming chemicals, including volatile organic compounds, are trapped close to the ground. As people continue driving, and sources other than motor vehicles continue to release smog-forming pollutants into the air, the smog level keeps getting worse.

Ultraviolet B (UVB)

A type of sunlight. The ozone in the stratosphere, high above the Earth, filters out ultraviolet B rays and keeps them from reaching the Earth. Ultraviolet B exposure has been associated with skin cancer, eye cataracts and damage to the environment. Thinning of the ozone layer in the stratosphere results in increased amounts of ultraviolet B reaching the Earth.

Vapor Recovery Nozzles

Special gas pump nozzles that will reduce release of gasoline vapor into the air when people put gas in their cars. There are several types of vapor recovery nozzles, so nozzles may look different at different gas stations. The 1990 Clean Air Act requires installation of vapor recovery nozzles at gas stations in smoggy areas.

Volatile Organic Compounds (VOCs)

Organic chemicals all contain the element carbon (C); organic chemicals are the basic chemicals found in living things and in products derived from living things, such as coal, petroleum and refined petroleum products. Many of the organic chemicals we use do not occur in Nature, but were synthesized by chemists in laboratories. Volatile chemicals produce vapors readily; at room temperature and normal atmospheric pressure, vapors escape easily from volatile liquid chemicals. Volatile organic chemicals include gasoline, industrial chemicals such as benzene, solvents such as toluene and xylene, and tetrachloroethylene (perchloroethylene, the principal dry cleaning solvent).

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Many volatile organic chemicals are also hazardous air pollutants; for example, benzene causes cancer.