

AIR POLLUTION

glossary

8-hour ozone attainment: a standard measurement of air quality that requires ozone levels to be less than 85 parts per billion (ppb) when averaged over 8-hour time blocks, for three years.

acid rain: rain caused by a chemical reaction that begins when compounds such as sulfur dioxide and nitrogen oxide are released into the air. These substances can rise very high into the atmosphere, where they mix and react with water, oxygen, and other chemicals to form more acidic pollutants and become a part of our precipitation.

biofuel: organic material made from plants and animals, containing energy stored from the sun, which is burned or converted to create fuel. Wood, crops (such as corn and sugar cane), vegetable oils, and animal fats are primary examples.

biomass: organic material made from plants and animals that can be burned as a renewable and carbon dioxide neutral source of energy.

black carbon: a form of particulate air pollution usually caused by biomass burning, cooking with solid fuels and diesel exhaust.

cap and trade: an approach to reducing pollution by placing a limit (cap) on the amount of greenhouse gases that a company or country can legally emit and having companies pay penalties if they exceed it. This is paired with a market where companies buy and sell allowances (trade) permitting a certain amount of emissions. Companies that cut their emissions can save money by selling or saving their allowances, thereby incentivizing lower pollution.

carbon dioxide (CO₂): a naturally occurring greenhouse gas in the atmosphere, concentrations of which have increased mostly due to human activities, such as the combustion of fossil fuels.

carbon dioxide emissions: carbon dioxide released into the atmosphere mostly from burning fossil fuels and other human activities.

carbon monoxide (CO): an odorless, colorless, tasteless gas that forms from the incomplete combustion (burning) of carbon containing fuels such as coal, wood, charcoal, natural gas, and fuel oil.

catalytic converters: car pollution control devices which help remove carbon monoxide from car exhaust.

citizen scientists: members of the general public who collect and analyze data relating to the natural world, typically as part of collaborative projects with professional scientists.

Clean Air Act of 1970: the first comprehensive federal response to address air pollution, which mandates that the Environmental Protection Agency implement and regulate programs to reduce air pollution nationwide.

Clean Air Act of 1990: a package of amendments to the Clean Air Act designed to address environmental issues such as acid rain, toxic pollutants, and urban air pollution. The amendments also began the phase out of several ozone-depleting chemicals and promoted the use of low sulfur coal and natural gas to curb acid rain.

emissions trading: a process established by Congress which assigns allowances (one allowance = one ton of emissions per year) to electric utilities and other industries that produce pollutants. Each utility or factory decides the most cost-effective way to reduce its emissions; then it may sell the allowances it no longer needs after the reductions.

Environmental Protection Agency (EPA): federal agency established by the White House and Congress in 1970 "in response to the growing public demand for cleaner water, air and land." Today, the EPA leads U.S. environmental science, research, education and assessment efforts.

fossil fuels: energy resources from the remains of plants and animals; most commonly used are oil, coal, and natural gas. When burned for energy, they create byproducts, such as carbon dioxide and nitrous oxide (greenhouse gases).

global warming: the increase in the average temperature of the Earth's surface.

greenhouse gases (GHGs): gases which allow sunlight to enter the atmosphere freely, then absorb infrared radiation and trap heat in the atmosphere. Common examples include carbon dioxide, methane, nitrous oxide, chlorofluorocarbons, and ozone.

indoor air pollution: air pollution in and around buildings and structures, often produced by cooking and heating using solid fuels like wood, charcoal, coal, and crop wastes. These practices can produce high levels of smoke containing a variety of health-damaging pollutants such as fine particles and carbon monoxide.

net-zero emissions: achieving a balance between the greenhouse gases put into the atmosphere and those taken out.

nitrogen dioxide (NO₂): gas produced during many fossil fuel combustion processes that contributes to air pollution and acid rain. While many of the nitrogen oxides are colorless and odorless, nitrogen dioxide, along with particles in the air, can often be seen as a reddish-brown layer over urban areas.

nitrogen oxides (NOx): gases formed when fuel is burned at high temperatures, as in a combustion process. The primary manmade sources of nitrogen oxides are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels.

ground-level ozone (smog): a gas created by chemical reactions between oxides of nitrogen (NOx) and volatile organic compounds (VOC) in the presence of sunlight. Major sources of NOx and VOC include emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents.

ozone standards: norms that impose limits on the amount of ozone produced. EPA establishes minimum standards, but states are allowed to be stricter.

particulate matter (PM): suspended particles of soot, ash, dust, acids, metals, and chemicals. Once inhaled, these particles can affect the heart and lungs and cause serious health risks.

redlining policies: illegal practices of refusing to offer credit or insurance in a particular community on a discriminatory basis (as because of the race or ethnicity of its residents).

slums: informal settlements in urban areas that are densely populated and may be characterized by poor housing and a lack of reliable services such as sanitation, electricity, clean water and law enforcement.

sulfur dioxide (SO₂): a gas formed when fuel containing sulfur (such as coal and oil) is burned, when gasoline is extracted from oil, or when metals are extracted from ore. SO₂ dissolves in water vapor to form acid, and it interacts with other gases and particles in the air to form sulfates and other products that can be harmful to people and the environment.

temperature inversions: a reversal of normal air behavior where a layer of cool air at the Earth's surface is overlaid by a layer of warm air above it, preventing the upward movement of air and trapping air pollution near the surface.

United Nations Sustainable Development Goals (SDGs): 17 interconnected goals that provide individualized guidelines and targets to help every nation develop sustainably, protecting the planet and ensuring all people enjoy peace and prosperity. The SDGs are meant to build on the Millennium Development Goals (2000 - 2015) and also focus attention on addressing new problems such as climate change, economic inequality, and sustainable consumption among other priorities.

ultraviolet (UV) radiation: part of the electromagnetic spectrum emitted by the sun. Though some is absorbed by the atmospheric ozone, most UV radiation reaches the Earth's surface. Small amounts of UV radiation are essential for the production of vitamin D in people, yet overexposure may result in acute and chronic health effects on the skin, eye, and immune system.

World Health Organization (WHO): an international organization that collaborates with governments and other partners to "build a better, healthier future for people all over the world." WHO directs and coordinates international health in the United Nations' system.