

CLIMATE CHANGE

glossary

afforestation: the planting of trees in an area where there were no trees before to create a new forest.

anaerobic digestion: a process through which bacteria break down organic matter – such as animal manure, wastewater biosolids, and food wastes – in the absence of oxygen.

anthropogenic: caused or influenced by humans, often referring to human impacts on the environment or pollution produced by our activities.

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 budget: the cumulative amount of carbon dioxide emissions permitted over a period of time to keep the global average temperature within a certain threshold.

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 footprint: the amount of carbon dioxide and other greenhouse gases produced by the activities of a person or group in a given time frame.

carbon tax: a fee charged for carbon dioxide and greenhouse gas emissions, with the aim of discouraging the burning of fossil fuels (coal, oil, gas) and incentivizing energy efficiency and switching to cleaner energy sources.

chlorofluorocarbons (CFCs): ozone-depleting substances (ODSs), such as cleaning solvents or refrigerants, that are among the strongest insulators of greenhouse gases.

climate activism: civic engagement that specifically aims to pressure governments to take action that addresses the issue of climate change. Forms of engagement range from tactics that involve citizens working directly to change their individual behaviors, to those that involve indirect efforts to bring about change through the political and economic systems.

climate change: the regional and global changes in weather patterns and natural phenomena primarily caused by the human use of fossil fuels that releases carbon dioxide and other greenhouse gases into Earth's atmosphere. These changes include increased temperature trends on Earth's surface, sea level rise, sea and glacier ice melting, and extreme weather events.

climate refugees: people forced to leave their homes or communities because of the effects of climate change, including sea level rise, drought and desertification.

climate vulnerability: the degree to which natural ecosystems and human communities are susceptible to, or are unable to cope with, the adverse impacts of climate change.

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.

enteric fermentation: a natural part of the digestive process in ruminant animals such as cattle, sheep, goats, and buffalo. Microbes in the digestive tract, or rumen, decompose and ferment food, producing methane as a by-product.

environmental refugees: people forced to leave their homes due to a serious environmental disruption that threatens their survival or seriously affects their quality of life. Disruptions include sudden catastrophes such as floods and storms as well as slower disasters like prolonged drought, sea-level rise, and desertification.

food insecurity: a lack of consistent access to a sufficient quantity of affordable, nutritious food for an active and healthy life.

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.

greenhouse effect: the exchange of incoming and outgoing radiation from the sun that warms the Earth. When solar energy reaches Earth's atmosphere, some is reflected back to space and the rest is absorbed and re-emitted as heat by greenhouse gases. Increased levels of greenhouse gases from human activities trap more of the sun's radiation and warm the planet's surface above normal temperatures, causing global warming.

hydrofluorocarbons (HFCs): artificially produced chemicals used for refrigeration, air conditioning, foam blowing, aerosols, fire protection and solvents. HFCs were developed as alternatives to ozone-depleting substances phased out in the Montreal Protocol, but they have a global warming potential 1,000 to 3,000 times that of carbon dioxide, raising concerns about their efficacy as a replacement chemical.

Industrial Revolution: a period in the 18th and 19th centuries during which human society transitioned from an agrarian and handicraft economy to one dominated by industry and machine manufacturing. This process began in Britain and from there spread to other parts of the world. The Industrial Revolution marks a major historical turning point, influencing many aspects of daily life for people around the world and contributing to unprecedented and sustained human population growth.

market-based solution: a solution to an environmental problem that sets a price on pollution or other use of the environment and spurs businesses to find cost-effective ways to reduce their environmental impact.

methane (CH₄): a greenhouse gas that remains in the atmosphere for approximately 9-15 years, emitted from a variety of natural and human-influenced sources, such as landfills, natural gas and petroleum systems, agricultural activities, coal mining, stationary and mobile combustion, and wastewater treatment.

Montreal Protocol: adopted in 1987, an international agreement which controls the production and consumption of substances that can cause ozone depletion.

national climate action plans: individual countries' plans to translate the goals outlined in the Paris Agreement into action at the national level.

nitrous oxide (NOX): a gas 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. 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.

ozone: a gas made of three oxygen atoms (O₃) that occurs naturally in Earth's upper atmosphere (the stratosphere) and protects life on Earth from the sun's harmful ultraviolet (UV) radiation. Ozone is also created by chemical reactions between air pollutants in the lower atmosphere (the troposphere) near Earth's surface, where it can be toxic to humans, wildlife and plants.

ozone-depleting substances (ODSs): human made chemicals, such as chlorofluorocarbons, that deplete the ozone in the upper atmosphere and are the strongest insulators of greenhouse gases.

Paris Agreement: adopted in 2016, an international agreement that aims to respond to climate change by keeping global temperature rise below 2 degrees Celsius above pre-industrial levels. The agreement also focuses on strengthening countries' abilities to deal with climate change impacts. Nations that signed on develop a country-specific action plan outlining their best efforts to achieve the aims of the agreement.

permafrost: ground that remains below freezing (0°C) for at least two consecutive years. It often consists of a combination of soil, gravel, and sand bound together by ice.

subsidence: the gradual settling or sudden sinking of the Earth's surface because of the movement of underground material. Subsidence is often caused by removing water, oil, natural gas, or mineral resources out of the ground.

United Nations Framework Convention on Climate Change (UNFCCC): a treaty which sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change, produced at the 1992 U.N. Conference on Environment and Development.