Greenhouse Gases Encyclopedia Article

Greenhouse Gases

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Greenhouse Gases

Greenhouse gases are gases in the **atmosphere** that absorb and re-emit energy from the sun. They are believed to cause the global climatic changes known as the **greenhouse effect**.

The earth's **climate** depends on a wide variety of gases, vapors, and aerosols, and many of these contribute to global warming. **Carbon dioxide** is the most abundant; the atmosphere contains about 700 billion tons of this gas, and the oceans contain about 50 times this amount. Water vapor also contributes to global warming, and other important greenhouse gases include **ozone**, **methane**, **nitrous oxide**, and **chlorofluorocarbons**. Halogenated gases and a variety of volatile organic **hydrocarbons** are also important trace gases. Volatile compounds can absorb solar and infrared radiation directly; they can also affect the photochemistry of ozone, increasing the transmission of heat and thus indirectly affecting the climate. While not gases, small long-lived ambient particles, such as particulates, agricultural fields, **wetlands**, and oceans. Industrial emissions of greenhouses gases consist largely of **carbon** dioxide; these arise from burning **fossil fuels** such as **coal**, oil, and **natural gas**.

Increases in the concentrations of carbon dioxide and methane in the atmosphere during this century have been attributed in part to rapid increases in the utilization of fossil fuels. Efforts to reduce greenhouse gases have focused on limiting and controlling the burning of these fuels. There have been programs to encourage the utilization of other sources of energy such as **nuclear power**, or **alternative energy sources** such as **solar energy** or hydropower. Technologies for controlling fossil fuel emissions and sequestering ambient carbon dioxide have also been developed, and researchers have emphasized the importance of improving **energy efficiency** and **energy conservation**.

See Also

Air Pollution; Air Pollution Control; Flue Gas; Pollution Control

Resources

Periodicals

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