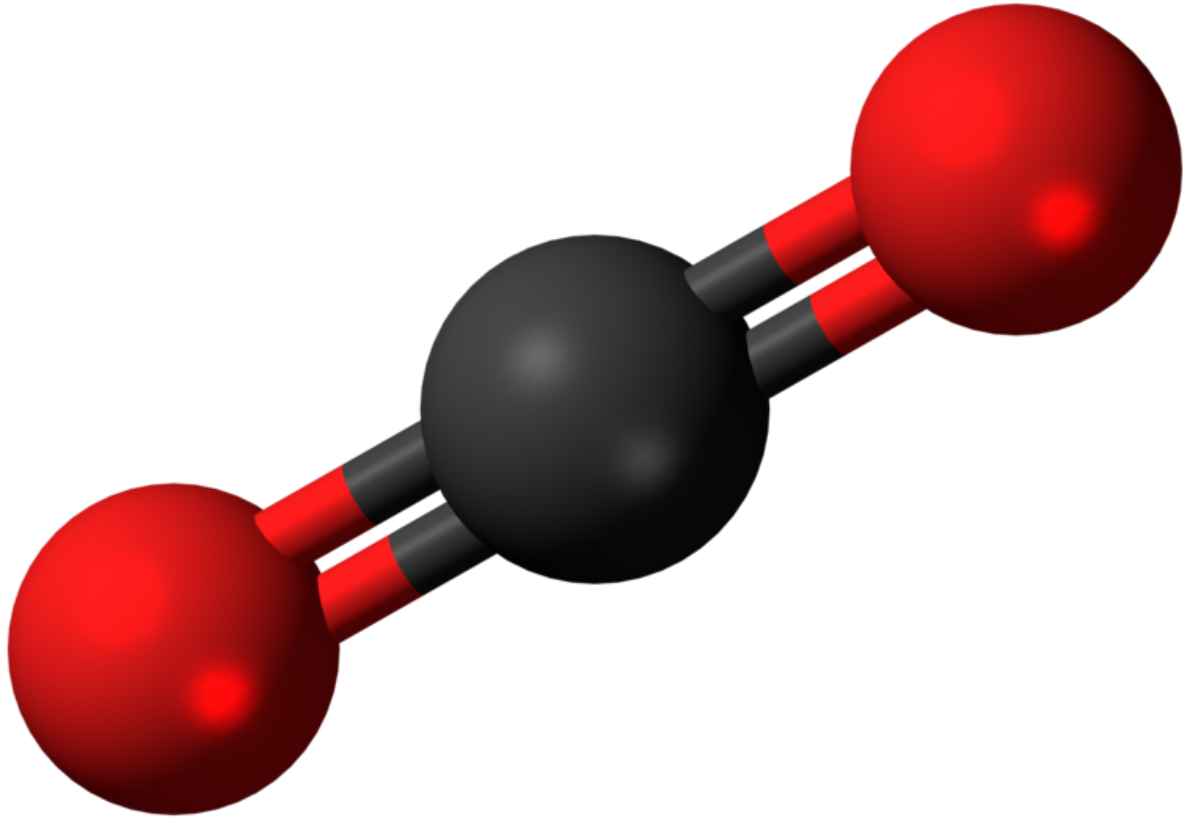


Carbon dioxide (CO₂)

By Lennart Kiil



A model of a carbon dioxide molecule.

[Jynto](#), [Public Domain](#).

Molecule made up of one carbon and two oxygen atoms.

Carbon dioxide is a gas under normal temperature and pressure conditions. It is part of the [carbon cycle](#) and it is currently found in a concentration of 385 parts per million in the [atmosphere](#) by volume. Carbon dioxide is the most important [greenhouse gas](#) after [water vapor](#).

The exact concentration of carbon dioxide in the atmosphere varies seasonally during the [annual cycle](#). Concentrations of carbon dioxide fall during the northern spring and summer as plants consume the gas through [photosynthesis](#), and rise during the northern autumn and winter as plants go dormant, die and decay.

The oceans form the other major reservoir of CO₂ in the carbon cycle. There is about 50 times as much CO₂, mainly as carbonic acid, in the ocean as in the atmosphere. How this fact affects [climate change](#) is still under debate, but it is known that water can contain less CO₂ when it warms, so there is concern that the oceans will be able to store less CO₂ in the future. This will lead to more warming and oceans with even lower capacities as [carbon sinks](#) in a [positive feedback](#) mechanism.

Both animal and plants release carbon dioxide into the atmosphere and the oceans because of [respiration](#). Some microorganisms produce carbon dioxide through fermentation. In both cases carbon from organic material is oxidized to make CO₂.

Through the [greenhouse effect](#) carbon dioxide helps make the Earth inhabitable to humans and most other animals and many plants.

In the period since [industrialization](#) the amount of carbon dioxide in the atmosphere has grown significantly. This growth is due to [human activity](#). The resulting enhanced greenhouse effect is believed to be one of the primary drivers in global warming.

The [anthropogenic](#) release of CO₂ to the atmosphere happens through the use of [fossil fuel](#). When fuel is burned CO₂ and water is released. Plants remove the same amount of CO₂ from the atmosphere during growth as they release when used for fuel. Fossil fuel, however, releases a reservoir of CO₂ that has otherwise been out of the carbon cycle for many hundred thousand years. The use of [biofuels](#) is [carbon neutral](#) whereas the use of fossil fuels is not.

Cutting the emissions of carbon dioxide is, therefore, one of the primary efforts for [mitigating global warming](#). The [Kyoto protocol](#) is an international effort to reduce the emission of carbon dioxide through [quotas and emission trading](#), primarily through less use of fossil fuel.

[Volcanic activity](#) also releases significant amounts of CO₂.

How to cite this entry

Lennart Kiil: "Carbon dioxide (CO₂)". Climate Encyclopedia, climate-encyclopedia.com/carbon-dioxide-co2, retrieved 24 October 2026.

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