

Methane

By Lennart Kiil



Ruminants such as cows produce methane when they digest their food.

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A [greenhouse gas](#) produced both naturally and by humans. Chemical formula: CH_4 .

[Ice core](#) analyzes have shown that currently the concentration of methane in the [atmosphere](#) is more than twice as high as before the [industrialization](#). It is very likely that the increase is [anthropogenic](#), i.e. caused by human activities.

The [global warming potential](#) of methane is significantly higher than that of CO_2 , but it is present in much smaller amounts in the atmosphere.

Wetlands are the largest source of naturally produced methane. In these areas the soil is waterlogged, saturated with water, and the oxygen concentration is very low or zero. The breakdown of organic material is carried out by microorganisms, methanogens,

which produce methane as a byproduct. Other significant natural methane sources include methane produced by the digestion of termites, and release from processes in the oceans.

Human production of methane exceeds the natural production. There is a substantial loss of methane gas during the extraction and production of natural gas, oil and coal. Livestock production also produces significant amounts of methane. Cattle and other ruminants produce methane gas directly as part of their digestive process, but methane gas is also released from manure. Other anthropogenic methane sources include waste treatment, rice fields, and burning of [biomass](#).

Substantial amounts of methane is contained in deposits below the Earth's surface. These deposits consist of so-called methane hydrate, which is a form of water ice containing a large amount of methane. Extensive methane hydrate deposits have been located below sediments on the ocean floors. A limited amount of methane gas released from such deposits contributes to the natural production of methane gas. However, there are concerns that [global warming](#) could cause a widespread and sudden melting of the deposits, resulting in an enormous release of methane gas to the atmosphere.

Because methane is a very potent greenhouse gas, this could lead to a [positive feedback](#) mechanism with an acceleration of global warming.

A similar concern exists regarding the possible melting of permafrost in the arctic and subarctic. Here the breakdown of organic material is slowed or halted by the permafrost, but could increase considerably should temperatures increase enough to melt the permafrost. In waterlogged areas this could lead to large amounts of methane gas being released.

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