

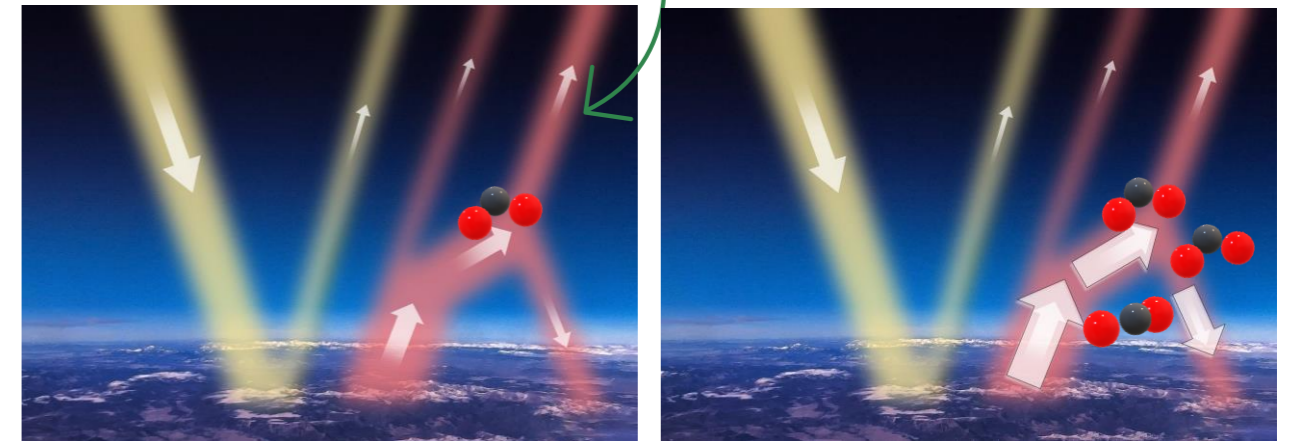
5. The Effect of Greenhouse Gases

Absorption in the atmosphere

Background:

The Earth's atmosphere consists mainly of nitrogen (78%) and oxygen (21%). Greenhouse gases such as carbon dioxide (0.04%) and methane (0.0002%) are only present in trace amounts, but nevertheless have a major impact! The molecules of the greenhouse gases absorb the invisible infrared radiation emitted by the Earth's surface and thus vibrate. This oscillation energy is then transferred to particles in the environment in the form of kinetic energy - the atmosphere warms up! What happens to the temperature of the atmosphere when people release large quantities of CO₂ into the atmosphere by burning fossil fuels?

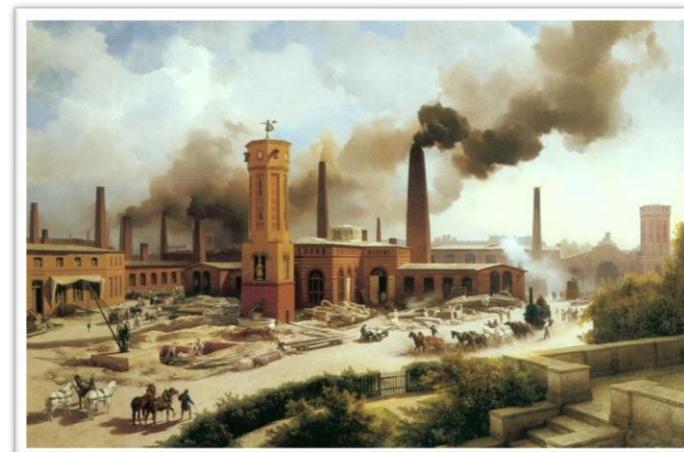
Only the **greenhouse gases** absorb the heat radiation of the earth and send it partially back to the earth's surface



Human induced climate change

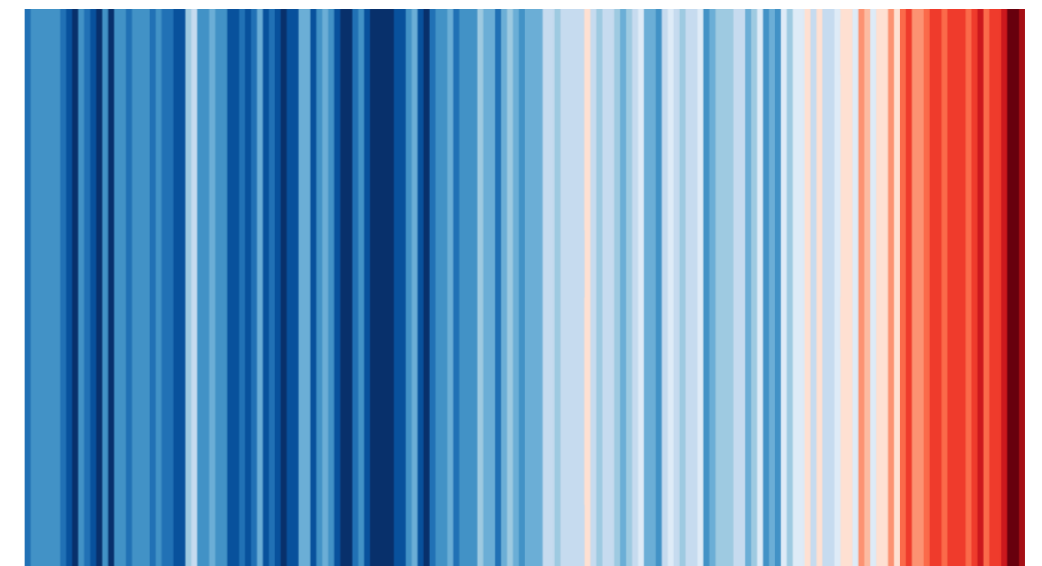


Extreme increase in atmospheric CO₂ concentration caused by humans, since the industrial revolution.



Karl Eduard Biermann 1847
Source: Preußen Kunst und Architektur, Wikimedia (11.02.2020)

Direct correlation of extreme CO₂ emissions and temperature increase on Earth.



Annual global temperatures from 1850-2017
Source: <https://www.climate-lab-book.ac.uk/2018/warming-stripes/> (13.12.2020)