

Vierzehn Aussagen/Forschungsergebnisse des IPCC

Aus dem Buch Climate Change /2007 WG 1, Aufsatz "If Emissions of Greenhouse Gases are Reduced, How Quickly do Their Concentrations in the Atmosphere Decrease? Wurden **ausgewählte Sätze** als Aussagen interpretiert von Dr. Hans Heinrich.

- a). The adjustment of greenhouse gas Concentrations in the atmosphere to reductions in emissions depends on the chemical and physical processes that remove each gas from the atmosphere. Concentrations of some greenhouse gases decrease almost immediately in response to emission reduction, while others can actually continue to increase for centuries even with reduced emissions.
- b). The concentration of a greenhouse gas in the atmosphere depends on the competition between the rates of emission of the gas into the atmosphere and the rates of processes that remove it from the atmosphere. For example, carbon dioxide (CO₂) is exchanged between the atmosphere, the ocean and the land through processes such as atmosphere-ocean gas transfer and chemical (e.g., weathering) and biological (e.g., photosynthesis) processes.**
- c). While more than half of the CO₂ emitted is currently removed from the Atmosphere within a Century, some fraction (about 20%) of emitted CO₂ remains in the atmosphere for many millennia
- d). Because of slow removal processes, atmospheric CO₂ will continue to increase in the long term even if its emission is substantially reduced from present levels.**
- e). A lifetime for CO₂ cannot be defined.
- f). If emissions increase with time, the atmospheric concentration will also increase with time, regardless of the atmospheric lifetime of the gas.**
- g). However, if actions are taken to reduce the emissions, the fate of the trace gas concentration will depend on the relative changes not only of emissions, but also of its removal processes.
- h). The behaviour of CO₂ is completely different from the trace gases with well-defined lifetimes.
- i). Stabilisation of CO₂ emissions at current levels would result in a continuous increase of atmospheric CO₂ over the 21st Century and beyond.
- j). "In fact, only in the case of essentially complete elimination of emissions can the atmospheric concentration of CO₂ ultimately be stabilised at a constant level. All other cases of moderate CO₂ emission reductions show increasing concentrations because of the characteristic exchange processes associated with the cycling of carbon in the climate system.**
- k). More specifically, the rate of emission of CO₂ currently greatly exceeds its rate of removal, and the slow and incomplete removal implies that small to moderate reductions in its emissions would not result in stabilisation of CO₂ concentrations, but rather would only reduce the rate of its growth in coming decades.)
- l.) A 10% reduction in CO₂ emissions would be expected to reduce the growth rate by 10%, while a 30% reduction in emissions would similarly reduce the growth rate of atmospheric CO₂ concentrations by 30%.**
- m.)
A 50% reduction would stabilise atmospheric CO₂, but only for less than a decade. After that, atmospheric CO₂ would be expected to rise again as the land and ocean sinks decline owing to well-known chemical and biological adjustments.
- n.)
Complete eliminations of CO₂-emissions is estimated to lead to a slow decrease in atmospheric CO₂ of about 40 ppm over the 21st century.