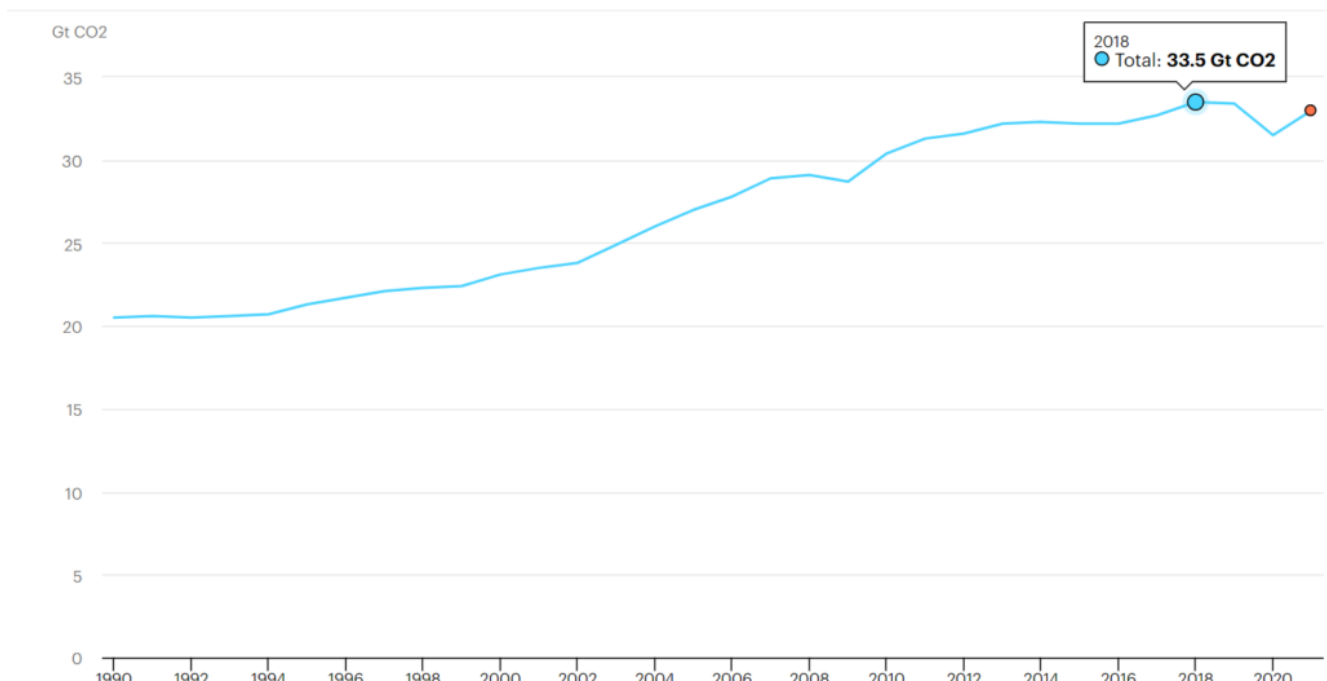


# 5 Simple Climate Facts

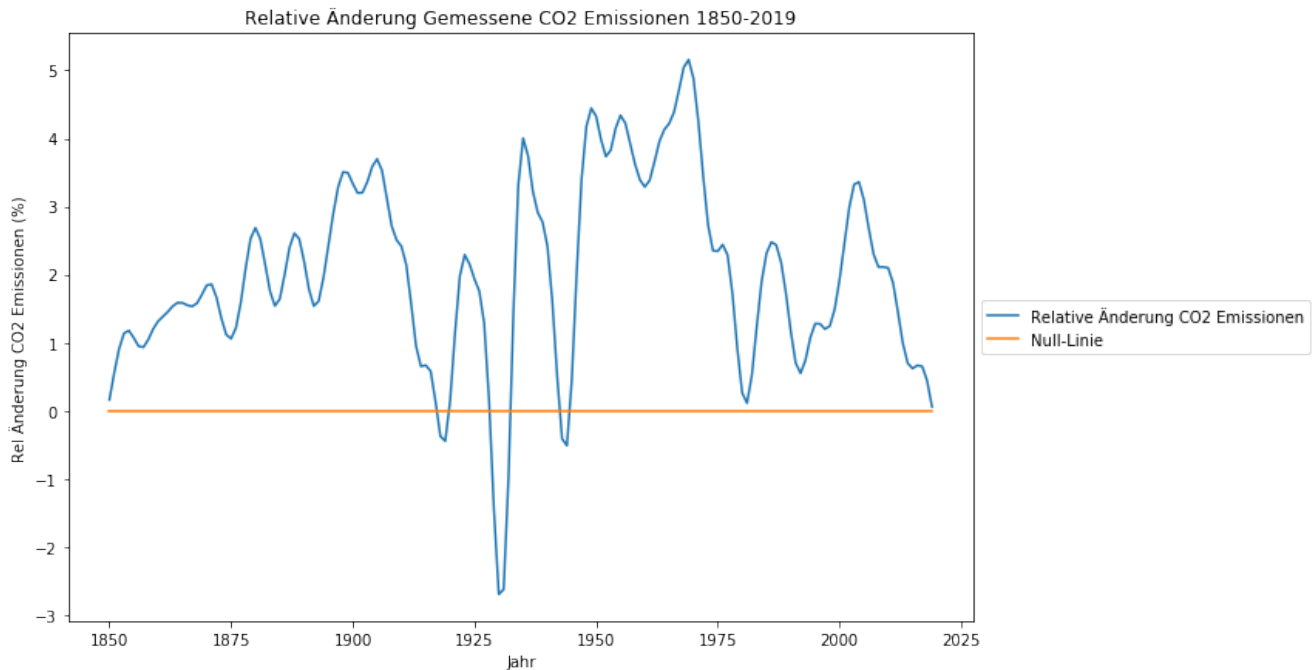
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## 1. Global CO<sub>2</sub> emissions have reached their maximum level in 2018 and are not expected to increase further

There was a massive drop in emissions in 2020 due to Corona. But the [maximum CO<sub>2</sub> emissions had already been reached in 2018](#) at 33.5 Gt, and 2019 and 2021 emissions are below that level as well:

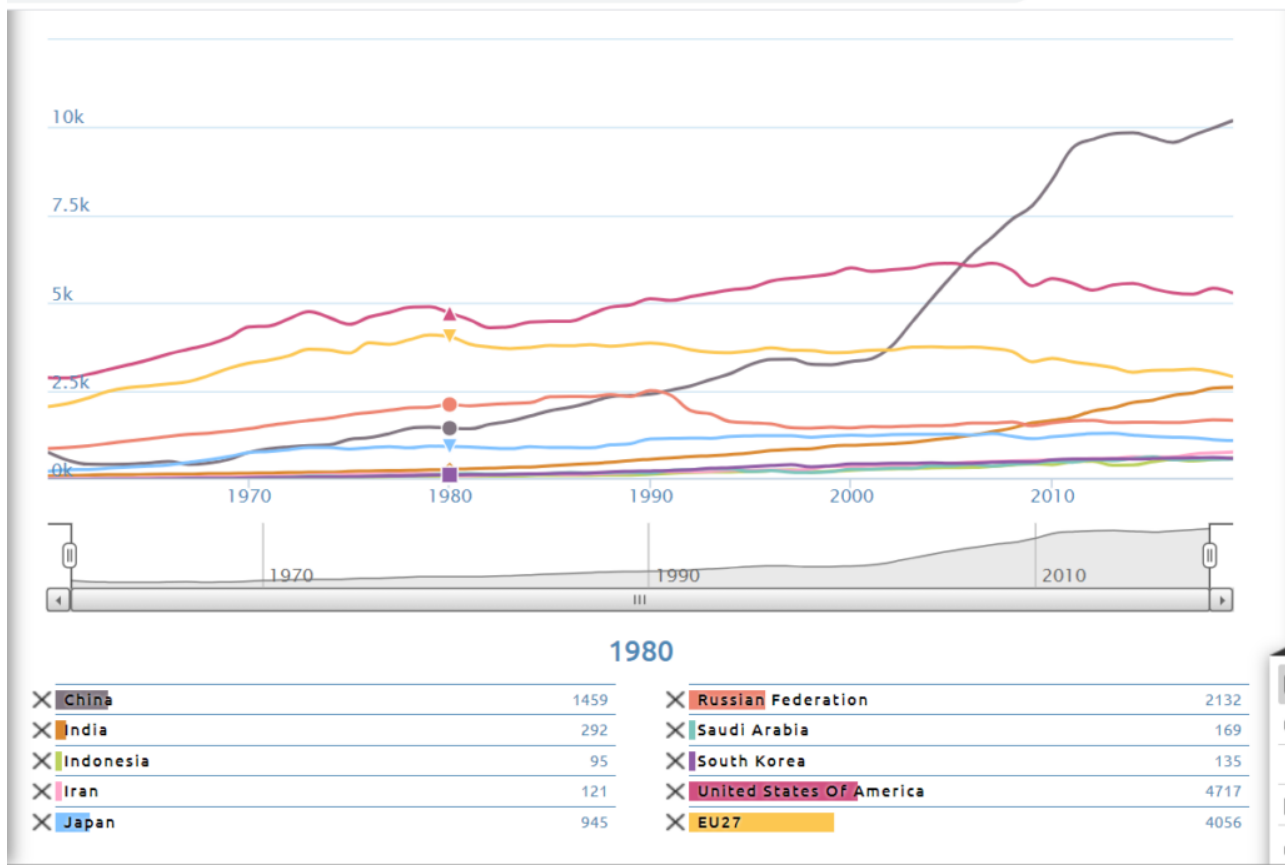


Already since 2003, there has been a clear trend of decrease in relative CO<sub>2</sub> emissions growth (analogue to economic growth), where between 2018 and 2019, the 0% line was then reached, as described in [this article](#):



The reason for this is that the growth in emissions in emerging economies now roughly balances the decline in emissions in industrialized countries. Also, there has already been a sharp bend in the emission growth in China in 2010.

globalcarbonatlas.org/en/CO2-emissions

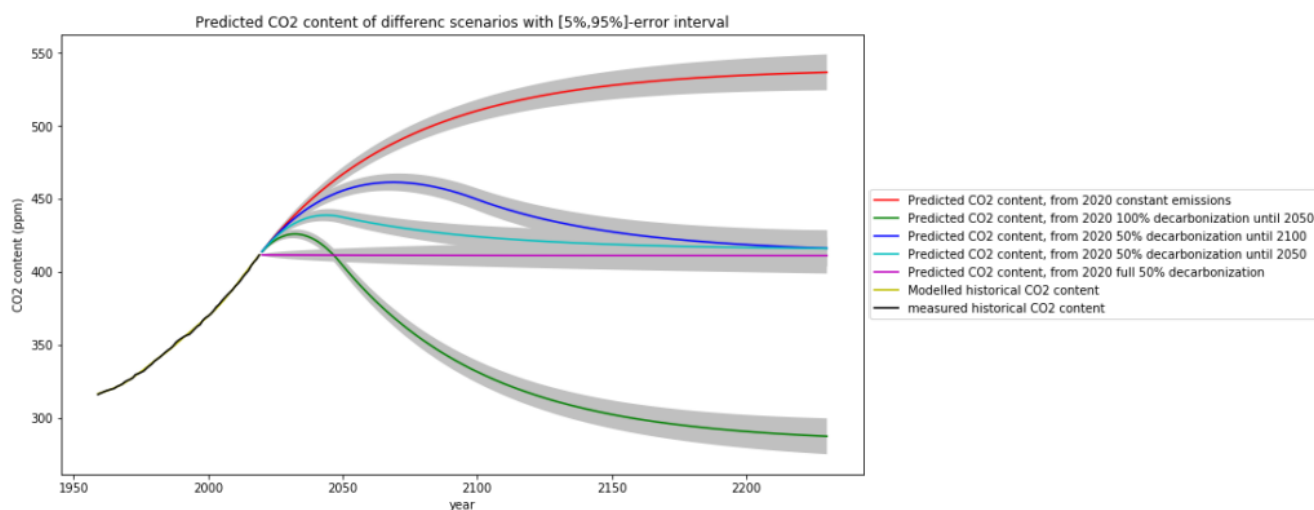


So the actual „business-as-usual“ scenario is not the catastrophic scenario RCP8.5 with exponentially growing

emissions that is still widely circulated in the media, but de facto a continuation of global CO<sub>2</sub> emissions at the plateau reached since 2018. So the partial target of the Paris climate agreement, „[Countries must reach peak emissions as soon as possible](#)“, has already been achieved for the world as a whole since 2018.

## 2. It is enough to halve emissions to avoid further growth of CO<sub>2</sub> levels in the atmosphere

To maintain the current level of CO<sub>2</sub> in the atmosphere, it would be sufficient to reduce emissions to half of today's level (<https://www.youtube.com/watch?v=JN39130I7Fc&t=291s> (in German)). The straightforward mathematical derivation and various scenarios (from „business as usual“ to „zero carbon energy transition“ can be found [in this article](#). Here the result of the predicted CO<sub>2</sub> concentration levels:



In the worst case, with future constant emissions, CO<sub>2</sub> concentration will be 500 ppm by 2100 and remain below the equilibrium concentration of 544 ppm, which is below double the pre-industrial concentration. **The essential point is that in no case will CO<sub>2</sub> levels rise to climatically dangerously high levels**, but they would probably fall to dangerously low levels if the global energy transition were „successful“, because current peak grain harvests are 15% larger than they were 40 years ago due to increased CO<sub>2</sub> levels.

Literally, the Paris climate agreement states in Article 4.1:  
Countries must reach peak emissions as soon as possible „**so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century.**“

This means that the balance between anthropogenic emissions and CO<sub>2</sub> removals must be achieved in the 2nd half of this century. **Fact is that the balance will be reached when total emissions are halved.** The time target to reach this 50% goal is between 2050 and 2100, these two limits correspond to the blue and turquoise green scenario. So **the Paris climate agreement does not call for complete decarbonization at all, but allows for a smooth transition rather than the disruption implied by the complete decarbonization.**

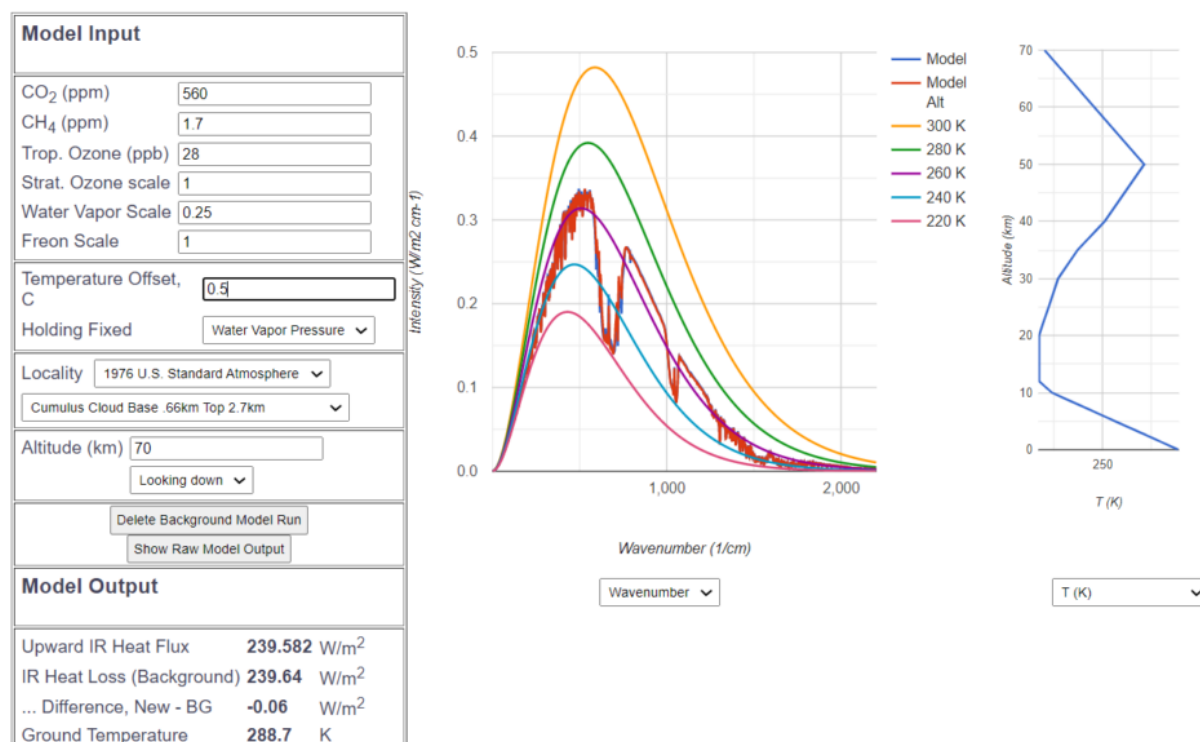
### **3. According to radiative physics, climate sensitivity is only half a degree**

The possible influence of \$CO\_2\$ on global warming is that its absorption of thermal radiation causes that radiation to reach space in a weakened form. The physics of this process is radiative transfer. To actually measure this greenhouse effect, the infrared radiation emitted into space must be measured. **The theoretically expected greenhouse effect is so tiny, at  $0.2 \frac{W}{m^2}$  per decade, that it is undetectable with current satellite technology, which has a measurement accuracy of about  $10 \frac{W}{m^2}$ .**

Therefore, one has no choice but to settle for mathematical models of the radiative transfer equation. However, this is not a valid proof for the effectiveness of this greenhouse effect in the real, much more complex atmosphere.

There is a widely accepted simulation program MODTRAN that can be used to simulate the emission of infrared radiation into space, and thus the \$CO\_2\$ greenhouse effect, in a physically clean way. If I use this program to calculate the so-called CO<sub>2</sub> sensitivity (the temperature increase when CO<sub>2</sub> doubles from 280 to 560 ppm) under correct conditions, the result is a mere 1/2

°C:



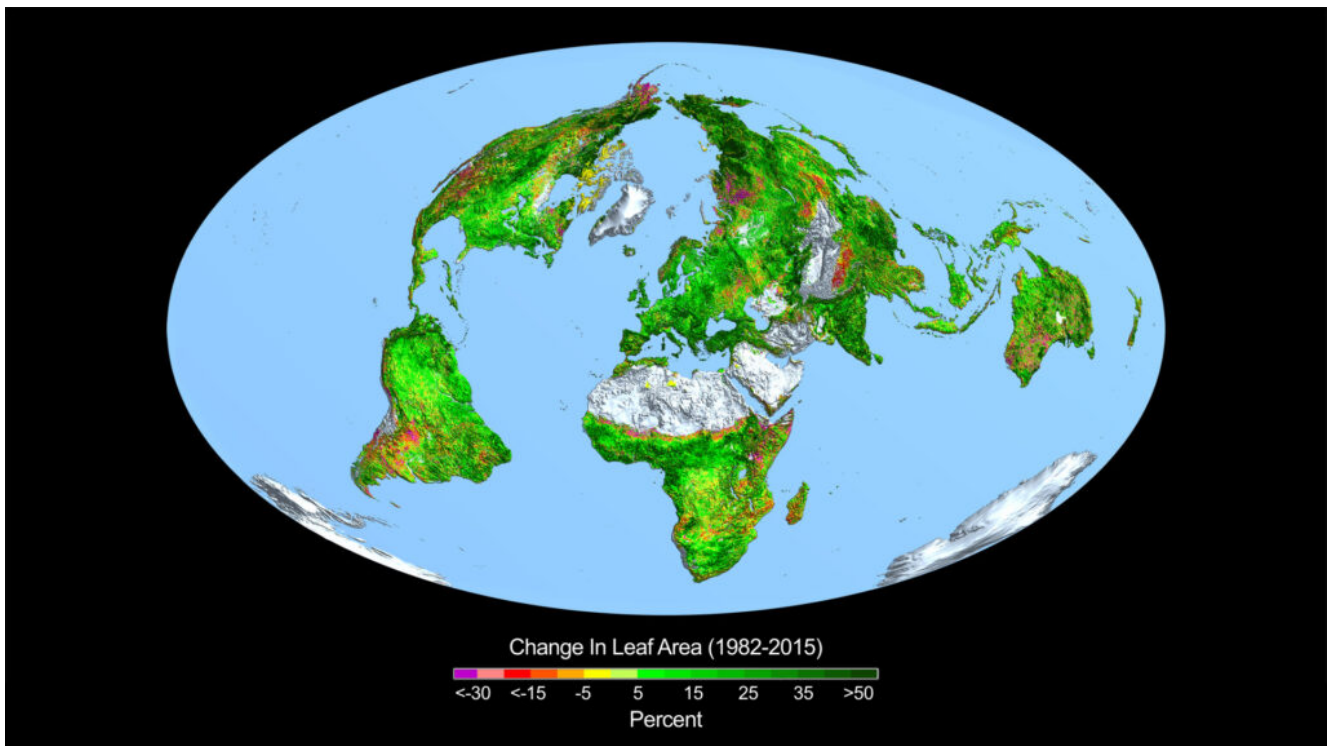
The facts are discussed [in this article](#). Also, in order to understand the mindset of IPCC-affiliated scientists, I describe there their, in my opinion, incorrect approach to sensitivity calculations using MODTRAN simulation.

Accordingly, if all real-world conditions are correctly accounted for, the temperature increase from doubling \$CO\_2\$ from 280 ppm to 560 ppm is just 1/2 °C, well below the Paris Climate Agreement targets.

#### 4. The only detectable effect of CO<sub>2</sub> increase is the greening of the Earth

While the **greenhouse effect is so far a theoretical hypothesis**, which because of its small effect (less than  $0.2 \frac{W}{m^2}$  in 10 years, which is only a fraction of the measurement errors of infrared satellite measurements ( $10 \frac{W}{m^2}$ ), **so far not provable beyond doubt**, another welcome effect of increased \$CO\_2\$ content has been abundantly demonstrated: [Between 1982 and 2009, the greening of the Earth has increased by 25-50%, 70% of which is due to increases in](#)

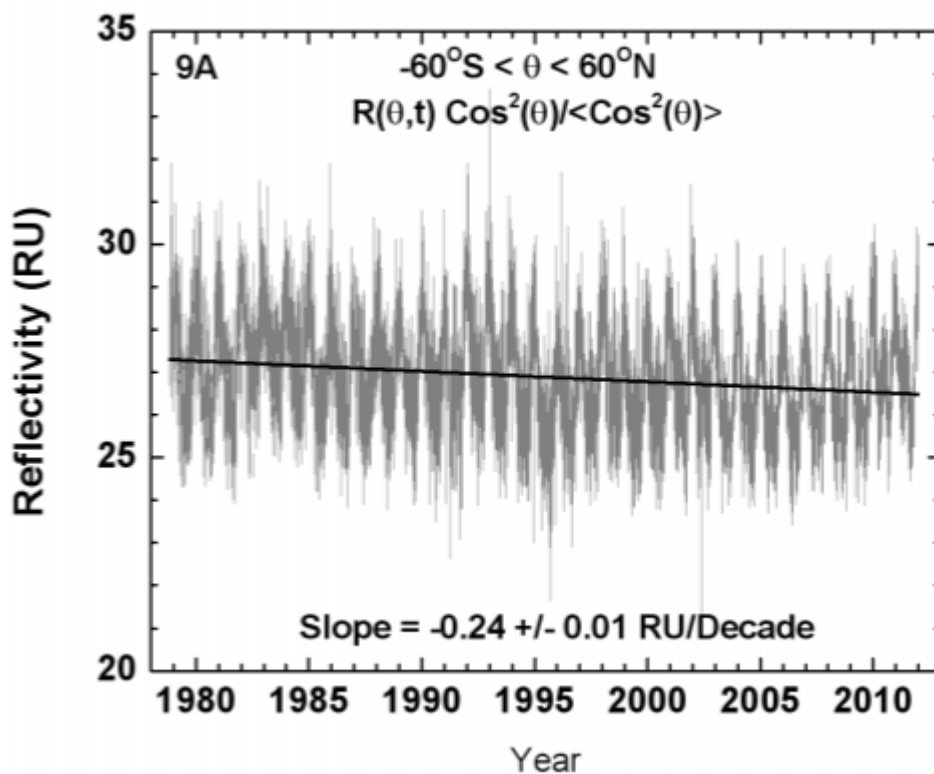
$\text{CO}_2$ . Notably, parts of Earth's drylands have also become greener because plants have a more efficient water balance at higher  $\text{CO}_2$  levels.



## 5. The increase in world mean temperature over the past 40 years has been caused by decreased cloud formation

It is a fact that the mean temperature of the world has increased considerably since 1970. If it is not only due to increased  $\text{CO}_2$  concentration, what could be the cause?

[A simple calculation shows](#) that 80% of the temperature increase over the last 40 years is due to the real and measurable effect of reduced cloud reflectivity, and at most 20% is due to the hypothetical and so far not definitively proven  $\text{CO}_2$  greenhouse effect:



The causes of reduced cloud formation may indeed be partly man-made, because [the basic mechanism of heat regulation by evaporation through plants and the resulting clouds](#) depends on the way humans farm and treat the natural landscape (see also [this video](#) (in German)). The most important man-made risk factors are

- [deforestation, in particular of rain forests](#), fatally often with the intention of thereby producing „sustainable“ energy,
- [urban heat islands](#) due to expansion of large cities,
- [expansion of arid lands and desert areas](#).

All 3 factors contribute to the 5% decrease of average cloud cover since 1950 ( <https://taz.de/Wasser-und-Klimaschutz/!5774434/> ), which explains at least 80% of the temperature rise since then as described above.

To stop the warming caused by reduced cloud formation, CO<sub>2</sub> emission reductions by stopping use of fossil fuels are of no use. A refocus on solving the real problems instead of

ideological fixation on CO<sub>2</sub> is overdue.