Neue Laborforschung zeigt: Steigender CO_2-Gehalt führt zu negativem Treibhauseffekt an den Polen

geschrieben von Chris Frey | 6. September 2025

Kenneth Richard

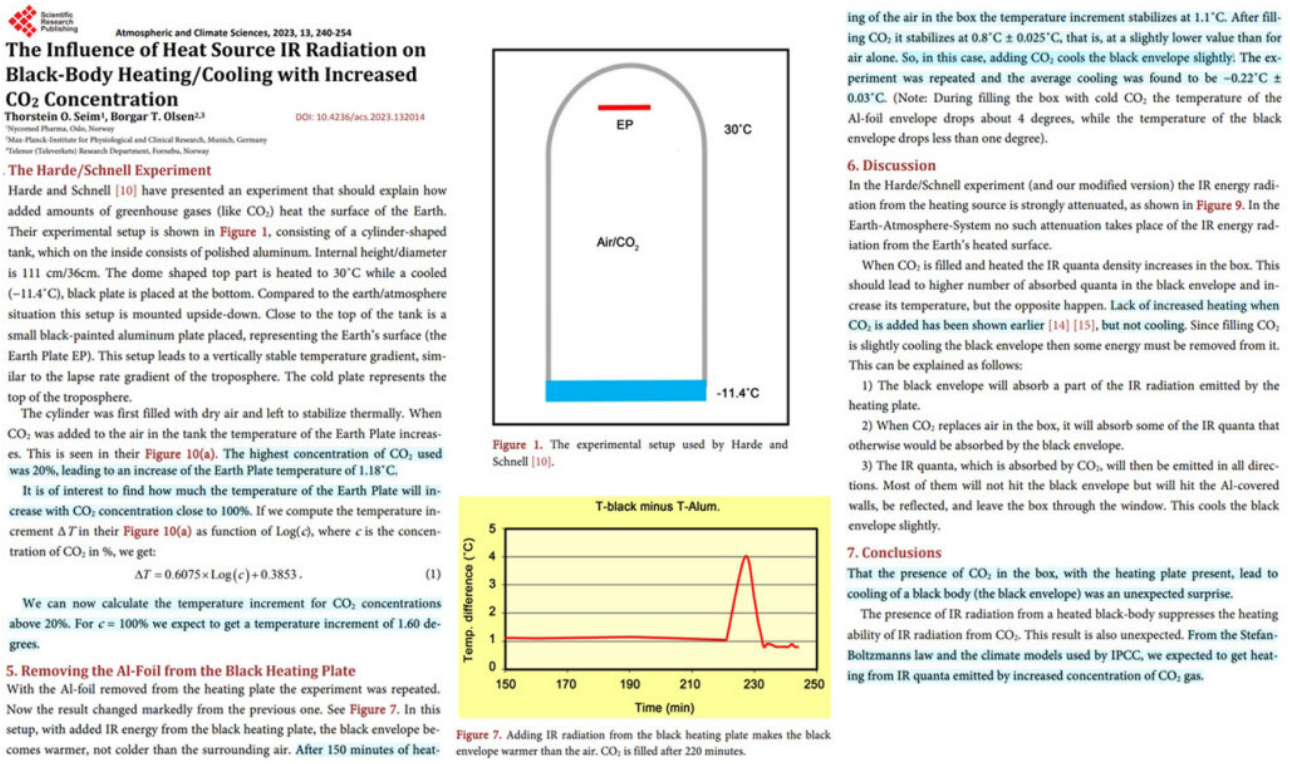
Die Beweise häufen sich. Die Empfindlichkeit des Klimas gegenüber einem Anstieg des atmosphärischen CO_2 ist praktisch gleich Null.

[Hervorhebung im Original]

Die Wissenschaftler Hermann Harde und Michael Schnell veröffentlichten im Jahr 2021 eine Studie mit dem Titel „Verification of the Greenhouse Effect in the Laboratory". In der Studie wird vorgeblich experimentell nachgewiesen, dass der atmosphärische CO_2-Treibhauseffekt nicht nur existiert, sondern auch im Einklang mit physikalischen Gesetzen funktioniert.

„Unseres Wissens nach ist dies der erste Nachweis des atmosphärischen Treibhauseffekts in einem Laborexperiment, das auch quantitative Messungen unter Bedingungen wie in der unteren Troposphäre ermöglicht. Wir verwenden einen Versuchsaufbau, der aus zwei Platten in einem geschlossenen Gehäuse besteht, wobei eine Platte in der oberen Position auf 30°C beheizt und die andere in der unteren Position auf -11,4°C gekühlt wird."

Einige Jahre später analysierten Thorstein Seim und Borgar Olsen (2023) ihren Versuchsaufbau noch genauer. Sie stellten fest, dass bei einer 500-fachen Erhöhung der CO_2-Konzentration, d. h. von 0,04 % (400 ppm) auf 20 % (200.000 ppm) im Treibhauseffekt-Experiment von Harde und Schnell, die Temperatur der Platte nur um 1,18 °C ansteigt, und um weitere 0,4 °C (insgesamt 1,6 °C), wenn die CO_2-Konzentration 100 % erreicht.



Atmospheric and Climate Sciences, 2023, 13, 240-254

The Influence of Heat Source IR Radiation on Black-Body Heating/Cooling with Increased CO_2 Concentration

Thorstein O. Seim[1], Borgar T. Olsen[2,3]
[1]Nycomed Pharma, Oslo, Norway
[2]Max-Planck-Institute for Physiological and Clinical Research, Munich, Germany
[3]Telenor (Televerkets) Research Department, Fornebu, Norway

DOI: 10.4236/acs.2023.132014

The Harde/Schnell Experiment

Harde and Schnell [10] have presented an experiment that should explain how added amounts of greenhouse gases (like CO_2) heat the surface of the Earth. Their experimental setup is shown in Figure 1, consisting of a cylinder-shaped tank, which on the inside consists of polished aluminum. Internal height/diameter is 111 cm/36cm. The dome shaped top part is heated to 30˚C while a cooled (−11.4˚C), black plate is placed at the bottom. Compared to the earth/atmosphere situation this setup is mounted upside-down. Close to the top of the tank is a small black-painted aluminum plate placed, representing the Earth's surface (the Earth Plate EP). This setup leads to a vertically stable temperature gradient, similar to the lapse rate gradient of the troposphere. The cold plate represents the top of the troposphere.

The cylinder was first filled with dry air and left to stabilize thermally. When CO_2 was added to the air in the tank the temperature of the Earth Plate increases. This is seen in their Figure 10(a). The highest concentration of CO_2 used was 20%, leading to an increase of the Earth Plate temperature of 1.18˚C.

It is of interest to find how much the temperature of the Earth Plate will increase with CO_2 concentration close to 100%. If we compute the temperature increment ΔT in their Figure 10(a) as function of Log(c), where c is the concentration of CO_2 in %, we get:

$$\Delta T = 0.6075 \times \mathrm{Log}(c) + 0.3853. \quad (1)$$

We can now calculate the temperature increment for CO_2 concentrations above 20%. For c = 100% we expect to get a temperature increment of 1.60 degrees.

5. Removing the Al-Foil from the Black Heating Plate

With the Al-foil removed from the heating plate the experiment was repeated. Now the result changed markedly from the previous one. See Figure 7. In this setup, with added IR energy from the black heating plate, the black envelope becomes warmer, not colder than the surrounding air. After 150 minutes of heating of the air in the box the temperature increment stabilizes at 1.1˚C. After filling CO_2 it stabilizes at 0.8˚C ± 0.025˚C, that is, at a slightly lower value than for air alone. So, in this case, adding CO_2 cools the black envelope slightly. The experiment was repeated and the average cooling was found to be −0.22˚C ± 0.03˚C. (Note: During filling the box with cold CO_2 the temperature of the Al-foil envelope drops about 4 degrees, while the temperature of the black envelope drops less than one degree).

Figure 1. The experimental setup used by Harde and Schnell [10].

Figure 7. Adding IR radiation from the black heating plate makes the black envelope warmer than the air. CO_2 is filled after 220 minutes.

6. Discussion

In the Harde/Schnell experiment (and our modified version) the IR energy radiation from the heating source is strongly attenuated, as shown in Figure 9. In the Earth-Atmosphere-System no such attenuation takes place of the IR energy radiation from the Earth's heated surface.

When CO_2 is filled and heated the IR quanta density increases in the box. This should lead to higher number of absorbed quanta in the black envelope and increase its temperature, but the opposite happen. Lack of increased heating when CO_2 is added has been shown earlier [14] [15], but not cooling. Since filling CO_2 is slightly cooling the black envelope then some energy must be removed from it. This can be explained as follows:

1) The black envelope will absorb a part of the IR radiation emitted by the heating plate.

2) When CO_2 replaces air in the box, it will absorb some of the IR quanta that otherwise would be absorbed by the black envelope.

3) The IR quanta, which is absorbed by CO_2, will then be emitted in all directions. Most of them will not hit the black envelope but will hit the Al-covered walls, be reflected, and leave the box through the window. This cools the black envelope slightly.

7. Conclusions

That the presence of CO_2 in the box, with the heating plate present, lead to cooling of a black body (the black envelope) was an unexpected surprise.

The presence of IR radiation from a heated black-body suppresses the heating ability of IR radiation from CO_2. This result is also unexpected. From the Stefan-Boltzmanns law and the climate models used by IPCC, we expected to get heating from IR quanta emitted by increased concentration of CO_2 gas.

Image Source: Seim and Olsen, 2023

Die „Conclusions“ der Studie lauten übersetzt: Die Tatsache, dass das Vorhandensein von CO_2 in der Box bei Anwesenheit der Heizplatte zur Abkühlung eines schwarzen Körpers (der schwarzen Hülle) führte, ***war eine unerwartete Überraschung****. Die Anwesenheit von IR-Strahlung eines geheizten schwarzen Körpers unterdrückt die Heizfähigkeit der IR-Strahlung von CO_2. Auch dieses Ergebnis ist* ***unerwartet.*** *Aufgrund des Stefan-Boltzmannschen Gesetzes und der vom IPCC verwendeten Klimamodelle erwarteten wir eine Erwärmung durch IR-Quanten, die von einer erhöhten CO_2-Konzentration ausgesandt werden.*

[Hervorhebungen vom Übersetzer. Gleiches hat ja Schnell auf einer EIKE-Tagung vorgestellt.]

In ihrer Arbeit von 2023 modifizierten Seim und Olsen jedoch das Experiment von Harde und Schnell (2021), um „die Situation auf der Erde und in der Atmosphäre“ besser zu simulieren. Sie fanden heraus, dass ihre veränderte Versuchsanordnung die Temperatur der Platte nicht nur geringfügig um etwas mehr als ein Grad erhöht, sondern dass eine Erhöhung des CO_2-Gehalts von 0,04 % auf 100 % den Schwarzen Körper (die Platte) tatsächlich um etwa -0,2 bis -0,3 °C abkühlt.

In einer weiteren neuen Laborstudie liefern Harde und Schnell 2025 nun experimentelle Beweise, die diesen negativen (oder gegen Null gehenden) Treibhauseffekt bei hohen CO_2-Konzentrationen weiter stützen. Ihr Versuchsaufbau zeigt, dass eine Erhöhung der CO_2-Konzentration von 20.000 (2 %) auf 80.000 ppm (8 %) zu einem negativen Treibhauseffekt führt, der eine Abkühlung um ein Zehntel eines Grades bewirkt.

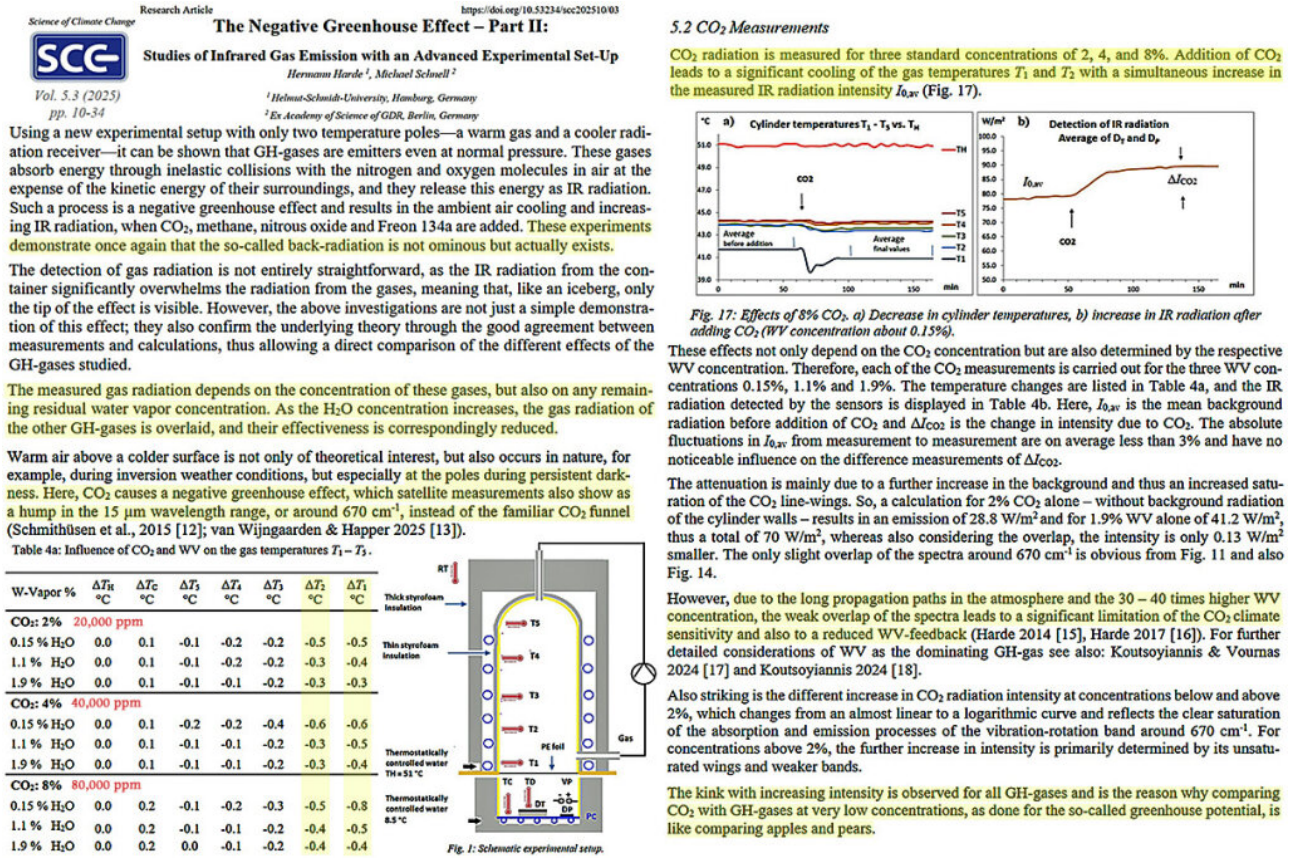
Dies ist möglicherweise das zweite Experiment, das den negativen Treibhauseffekt im Labor veranschaulicht. Von anderen Autoren veröffentlichte Strahlungsstudien (Schmithüsen et al., 2015, Chen et al., 2024) deuten ebenfalls darauf hin, dass der kühlende Einfluss der CO_2-Zugabe in polaren Klimazonen (Antarktis, Arktis) auftreten kann. Ein CO_2-induzierter negativer Treibhauseffekt in den hohen Breitengraden untergräbt das Narrativ der anthropogenen globalen Erwärmung (AGW), das besagt, dass der Mensch die „polare Verstärkung" oder das schnelle Schmelzen von Gletschern, Eisschilden und Meereis verursacht.

„Die CO_2-Strahlung wird für drei Standardkonzentrationen von 2, 4 und 8 % gemessen. Die Zugabe von CO_2 führt zu einer deutlichen Abkühlung der Gastemperaturen…"

Die neueste Studie von Harde und Schnell bestätigt auch, dass Wasserdampf (WV) den Treibhauseffekt (GHE) dominiert und somit die Annahme, dass CO_2 ein Treiber des Treibhauseffekts ist, „erhebliche Einschränkungen" hat. Im Gegensatz zu den in diesem Experiment verwendeten CO_2-Mengen von 2, 4 und 8 % wird die reale Atmosphäre mit 0,042 % CO_2 von WV-Konzentrationen dominiert, die 30-40 Mal höher sind. Daher sind die gesättigten Absorptionsbanden, bei denen CO_2 potenziell eine Wirkung haben könnte, „überlagert" oder „überlappt".

„Durch die langen Ausbreitungswege in der Atmosphäre und die um das 30 bis 40-fache höhere WV-Konzentration führt die schwache Überlappung der Spektren zu einer deutlichen Begrenzung der CO_2-Klimasensitivität…"

„Mit zunehmender H_2O-Konzentration wird die Gasabstrahlung der anderen GH-Gase überlagert und deren Wirksamkeit entsprechend reduziert."



Research Article https://doi.org/10.53234/scc202510/03

Science of Climate Change

The Negative Greenhouse Effect – Part II:

Studies of Infrared Gas Emission with an Advanced Experimental Set-Up

Hermann Harde [1], Michael Schnell [2]

[1] Helmut-Schmidt-University, Hamburg, Germany
[2] Ex Academy of Science of GDR, Berlin, Germany

Vol. 5.3 (2025)
pp. 10-34

Using a new experimental setup with only two temperature poles—a warm gas and a cooler radiation receiver—it can be shown that GH-gases are emitters even at normal pressure. These gases absorb energy through inelastic collisions with the nitrogen and oxygen molecules in air at the expense of the kinetic energy of their surroundings, and they release this energy as IR radiation. Such a process is a negative greenhouse effect and results in the ambient air cooling and increasing IR radiation, when CO_2, methane, nitrous oxide and Freon 134a are added. These experiments demonstrate once again that the so-called back-radiation is not ominous but actually exists.

The detection of gas radiation is not entirely straightforward, as the IR radiation from the container significantly overwhelms the radiation from the gases, meaning that, like an iceberg, only the tip of the effect is visible. However, the above investigations are not just a simple demonstration of this effect; they also confirm the underlying theory through the good agreement between measurements and calculations, thus allowing a direct comparison of the different effects of the GH-gases studied.

The measured gas radiation depends on the concentration of these gases, but also on any remaining residual water vapor concentration. As the H_2O concentration increases, the gas radiation of the other GH-gases is overlaid, and their effectiveness is correspondingly reduced.

Warm air above a colder surface is not only of theoretical interest, but also occurs in nature, for example, during inversion weather conditions, but especially at the poles during persistent darkness. Here, CO_2 causes a negative greenhouse effect, which satellite measurements also show as a hump in the 15 µm wavelength range, or around 670 cm^{-1}, instead of the familiar CO_2 funnel (Schmithüsen et al., 2015 [12]; van Wijngaarden & Happer 2025 [13]).

Table 4a: Influence of CO_2 and WV on the gas temperatures $T_1 - T_5$.

W-Vapor %	ΔT_R °C	ΔT_C °C	ΔT_5 °C	ΔT_4 °C	ΔT_3 °C	ΔT_2 °C	ΔT_1 °C
CO_2: 2% 20,000 ppm							
0.15 % H_2O	0.0	0.1	-0.1	-0.2	-0.2	-0.5	-0.5
1.1 % H_2O	0.0	0.1	-0.1	-0.2	-0.2	-0.3	-0.4
1.9 % H_2O	0.0	0.1	-0.1	-0.1	-0.2	-0.3	-0.3
CO_2: 4% 40,000 ppm							
0.15 % H_2O	0.0	0.1	-0.2	-0.2	-0.4	-0.6	-0.6
1.1 % H_2O	0.0	0.1	-0.1	-0.1	-0.2	-0.3	-0.5
1.9 % H_2O	0.0	0.1	-0.1	-0.1	-0.2	-0.3	-0.4
CO_2: 8% 80,000 ppm							
0.15 % H_2O	0.0	0.2	-0.1	-0.2	-0.3	-0.5	-0.8
1.1 % H_2O	0.0	0.2	-0.1	-0.1	-0.2	-0.4	-0.5
1.9 % H_2O	0.0	0.2	0.0	-0.1	-0.2	-0.4	-0.4

Fig. 1: Schematic experimental setup.

5.2 CO_2 Measurements

CO_2 radiation is measured for three standard concentrations of 2, 4, and 8%. Addition of CO_2 leads to a significant cooling of the gas temperatures T_1 and T_2 with a simultaneous increase in the measured IR radiation intensity $I_{0,av}$ (Fig. 17).

Fig. 17: Effects of 8% CO_2. a) Decrease in cylinder temperatures, b) increase in IR radiation after adding CO_2 (WV concentration about 0.15%).

These effects not only depend on the CO_2 concentration but are also determined by the respective WV concentration. Therefore, each of the CO_2 measurements is carried out for the three WV concentrations 0.15%, 1.1% and 1.9%. The temperature changes are listed in Table 4a, and the IR radiation detected by the sensors is displayed in Table 4b. Here, $I_{0,av}$ is the mean background radiation before addition of CO_2 and ΔI_{CO2} is the change in intensity due to CO_2. The absolute fluctuations in $I_{0,av}$ from measurement to measurement are on average less than 3% and have no noticeable influence on the difference measurements of ΔI_{CO2}.

The attenuation is mainly due to a further increase in the background and thus an increased saturation of the CO_2 line-wings. So, a calculation for 2% CO_2 alone – without background radiation of the cylinder walls – results in an emission of 28.8 W/m² and for 1.9% WV alone of 41.2 W/m², thus a total of 70 W/m², whereas also considering the overlap, the intensity is only 0.13 W/m² smaller. The only slight overlap of the spectra around 670 cm^{-1} is obvious from Fig. 11 and also Fig. 14.

However, due to the long propagation paths in the atmosphere and the 30 – 40 times higher WV concentration, the weak overlap of the spectra leads to a significant limitation of the CO_2 climate sensitivity and also to a reduced WV-feedback (Harde 2014 [15], Harde 2017 [16]). For further detailed considerations of WV as the dominating GH-gas see also: Koutsoyiannis & Vournas 2024 [17] and Koutsoyiannis 2024 [18].

Also striking is the different increase in CO_2 radiation intensity at concentrations below and above 2%, which changes from an almost linear to a logarithmic curve and reflects the clear saturation of the absorption and emission processes of the vibration-rotation band around 670 cm^{-1}. For concentrations above 2%, the further increase in intensity is primarily determined by its unsaturated wings and weaker bands.

The kink with increasing intensity is observed for all GH-gases and is the reason why comparing CO_2 with GH-gases at very low concentrations, as done for the so-called greenhouse potential, is like comparing apples and pears.

Image Source: Harde and Schnell, 2025

Es wird angenommen, dass der Anstieg der CO_2-Konzentration in der Atmosphäre um 100 ppm (0,01%) seit 1950 – von ~320 auf 420 ppm – die Hauptursache für die globale Erwärmung von 1950 bis heute ist. Diese Experimente zeigen jedoch, dass eine Erhöhung des CO_2 um das 2500-fache (0,04 % bis 100 %) oder sogar um das 100-fache (~40.000 ppm) nur zu einer unbedeutenden Erwärmung oder sogar zu einer Abkühlung um ein Zehntelgrad führt. Diese winzige thermische Auswirkung ist zu unbedeutend, um das Klima der Erde messbar zu beeinflussen.

Link:
https://notrickszone.com/2025/09/02/new-lab-research-shows-increasing-CO2-leads-to-a-negative-greenhouse-effect-at-the-poles/

Übersetzt von Christian Freuer für das EIKE