

The Magic of Climate Science

The secret to a well-performed magic trick is to deflect one's attention from what really matters. That is also the secret to self-deception.

This brief discussion will show how that magic is performed in climate science.

The very first IPCC report acknowledged that the earth is 33 °C warmer than it would be “without the greenhouse effect.” The “earth without the greenhouse effect” is a hypothetical construct consisting of a sphere in our orbit that reflects the same 30% of sunlight as the earth does and radiates that same amount of incoming energy back into space in the form of infrared radiation (IR). That sphere would have a temperature of 255 K (−18 °C, −0.4 °F). Our present average temperature of 288 K (15 °C, 59 °F) is indeed 33 °C higher.

There is no denying that the atmosphere, due mostly (but not entirely) to the greenhouse effect, keeps the surface of the earth 33 °C warmer than it would without the greenhouse and other warming effects.

Just as the naked sphere in our orbit radiates the same amount of heat energy that it receives from the sun, so does the earth. There are frequent disequilibria, but they are transient. Even Venus, with its atmosphere heavily loaded with ninety times as much atmospheric pressure and roughly 100,000 times as much carbon dioxide (CO₂) as we have, obeys the same rule.

Averaged over the sphere, the earth absorbs 240 watts per square meter from the sun and emits that much into outer space.

The greenhouse effect is the absorption of IR and the distribution of that absorbed energy into atmospheric heat by very complex interactions. Our concerns here are just with the gross heat distribution and its modification caused by an increase in CO₂ concentration.

The surface of the earth, comprising the soil, the oceans, and everything else beneath the atmosphere is generally agreed to have an average temperature of the surface of 288 K (15 °C), and calculably radiates 390 watts per square meter.

Let there be no doubt that the atmosphere, for all its complicated behaviors, is responsible for the difference between surface radiation and global radiation. The surface radiates 390 watts per square meter, and much of that radiated heat is absorbed by the atmosphere, so that only 240 watts per square meter radiates into space. That difference is why the surface of the earth is 33 °C higher than the hypothetical “earth without the greenhouse effect.”

None of the discussion above is controversial, but one word used twice in the previous paragraph takes us dangerously close to heresy. We will get to that point directly, but we must first discuss the effect of adding more CO₂ to the atmosphere, as we are doing when we burn coal, oil, and natural gas.

Out of every million molecules in the atmosphere, there are now about 400 molecules of CO₂. The IR spectrum of CO₂ can be used to determine its greenhouse effect at any concentration, any pressure and any temperature. The warming effect of the first 100 parts per million accounts for about 90 percent of the total CO₂ effect resulting from 400 parts per million. From here on, the heating effect from each doubling — from 400 to 800, from 800 to 1600 — is about 3.5 watts per square meter. It is also generally agreed that CO₂ is responsible for 20% of the present overall warming effect of the atmosphere.

We next come to a term defined by the IPCC: “Radiative forcing (RF) quantifies the change in energy fluxes caused by changes in these drivers for 2011 relative to 1750, unless otherwise indicated. Positive RF leads to surface warming, negative RF leads to surface cooling.”

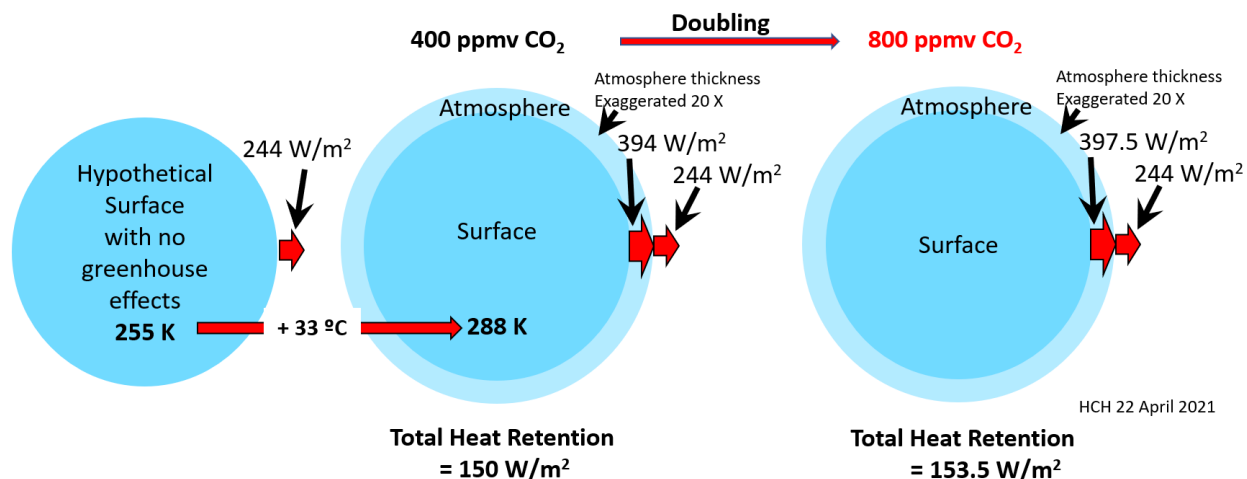
As a matter of ethos, magicians admire their colleagues' work, but never divulge how the trick is done. The “radiative forcing” terminology of the IPCC unwittingly gives away the secret. Why, you ask, should radiative forcing in 2011 be compared with that of 1750 when the Little Ice Age began to wane?

There is nothing magic about 1750 as a reference year, but any other year would be just as bad. What the IPCC is doing with this deceptive name “radiative forcing” is to make people (probably even themselves) believe that small changes in radiative fluxes are the whole shebang. They are not — by a long shot. It is a very misleading term.

A better term would be “radiative nudging.”

We now reveal the important twice-used word: *difference*, as in the result of subtraction. The “radiative forcing” fetish keeps people from subtracting to get the difference between the radiation emitted by the surface and the radiation emitted to outer space. The difference — 150 watts per square meter — is the total amount of heat retention. The radiative nudge due to CO₂ doubling is 3.5 watts per square meter. The magical misdirection has been to deflect everybody’s attention away from the total.

Let us put some facts together, not one of them in any way controversial. The total heat retention is 150 watts per square meter, and that amount warms the earth by 33 °C. Doubling CO₂ raises the total by a whopping 2.3 percent to 153.5 watts per square meter and (by itself) warms the earth by less than 0.8 °C.



Nothing in it is controversial, save at the margins. Some would say that the amount of warming (compared to the no-greenhouse earth) is 34 °C. Some would say that the surface radiates 400 W/m². Some would say that the additional “forcing” from doubling CO₂ concentration is 3.7 W/m², and some round that off to 4 W/m².

Upshot: *About* 150 W/m² of heat retention raises temperature *about* 33 °C. Doubling CO₂ will increase the heat retention by *about* 2 or 3 percent. And it’s going to do *WHAT?*

How is a change of 2.3 percent in heat retention going to lead to disaster? Climate modelers assure us that the warming from CO₂ has positive feedback effects that multiply the warming. For example: melting snow, exposing darker soil; evaporating water, causing higher humidity; and melting permafrost, releasing natural gas, a strong greenhouse gas, all of which raise the temperature higher and higher.

The curious thing about these knock-on effects is that *they are caused by warming, not by CO₂ itself*. It follows, therefore, that any warming from any cause whatsoever should result in the same temperature bootstrapping. Surely, over the eons, there have been millions of warming events that should have resulted in ever-increasing warming. If they had occurred, we would not be here reading newspapers.

It takes dedicated climate scientists running Garbage-in Garbage-out computer programs on supercomputers to turn that tiny nudge into terabytes of climate horror stories flooding the news media and — worse yet — leading science journals.

You can fool some of the people all of the time and all of the people some of the time, and that’s enough to set up a multi-billion dollar “climate crisis” industry.

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