

From: Barry Bickmore <bbickmore@comcast.net>
Subject:
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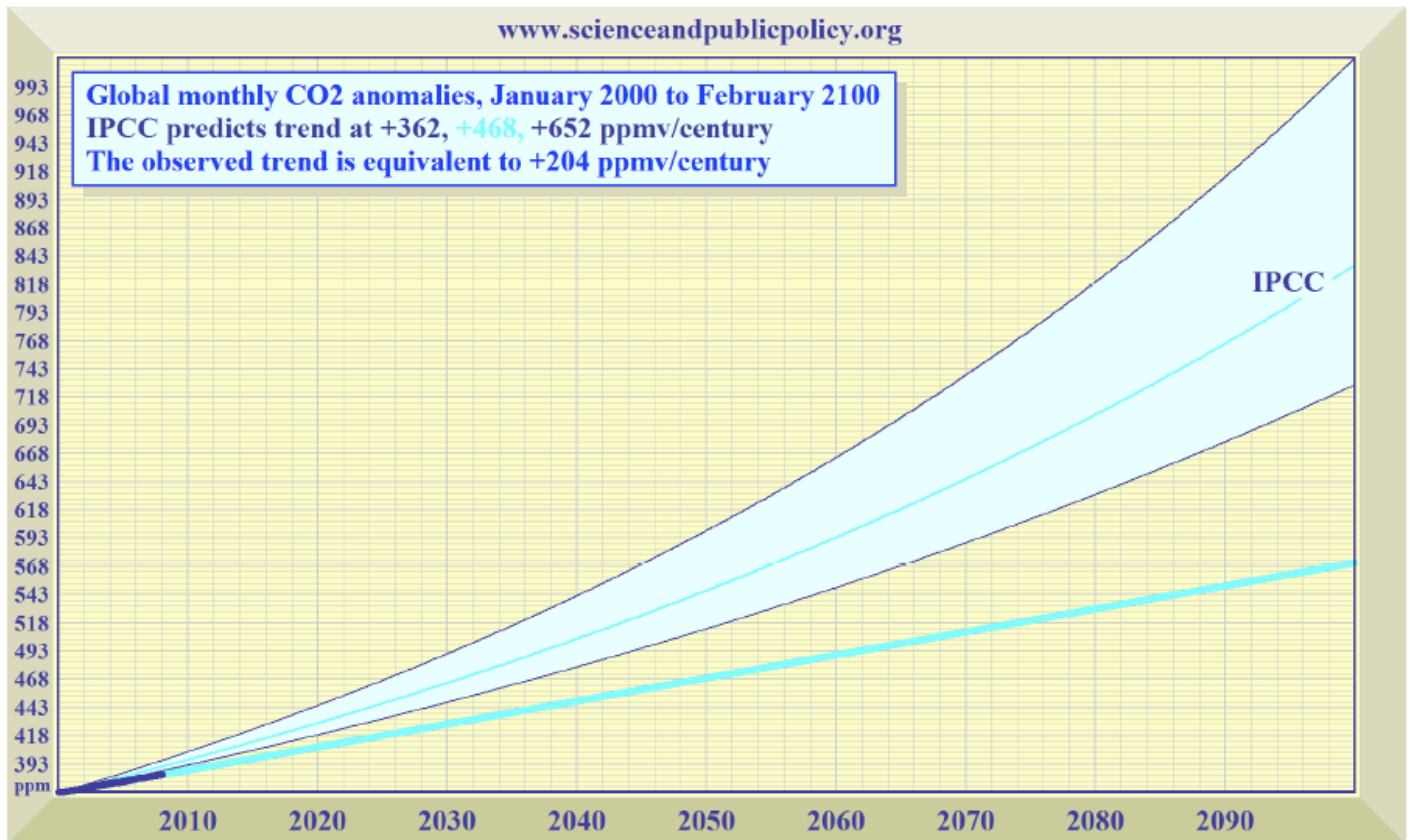


7 Attachments, 1.9 MB

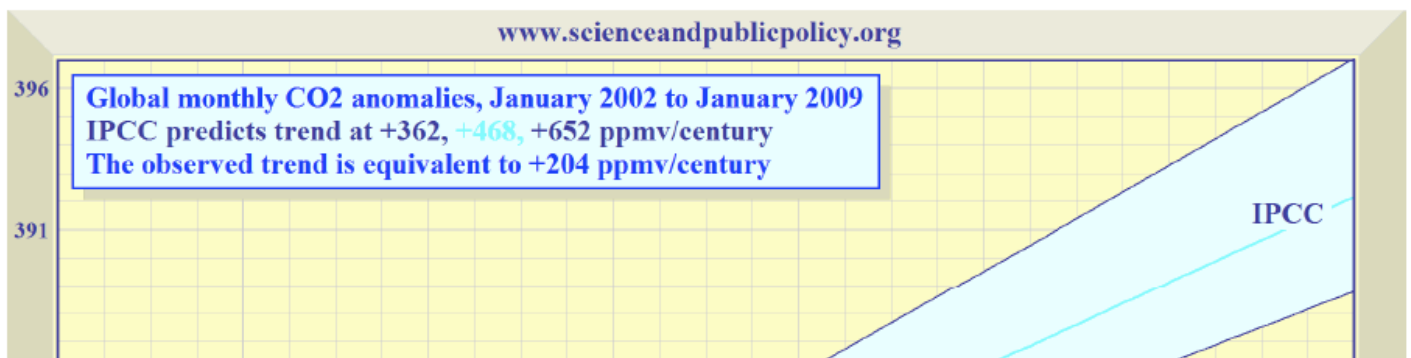
Hi everyone,

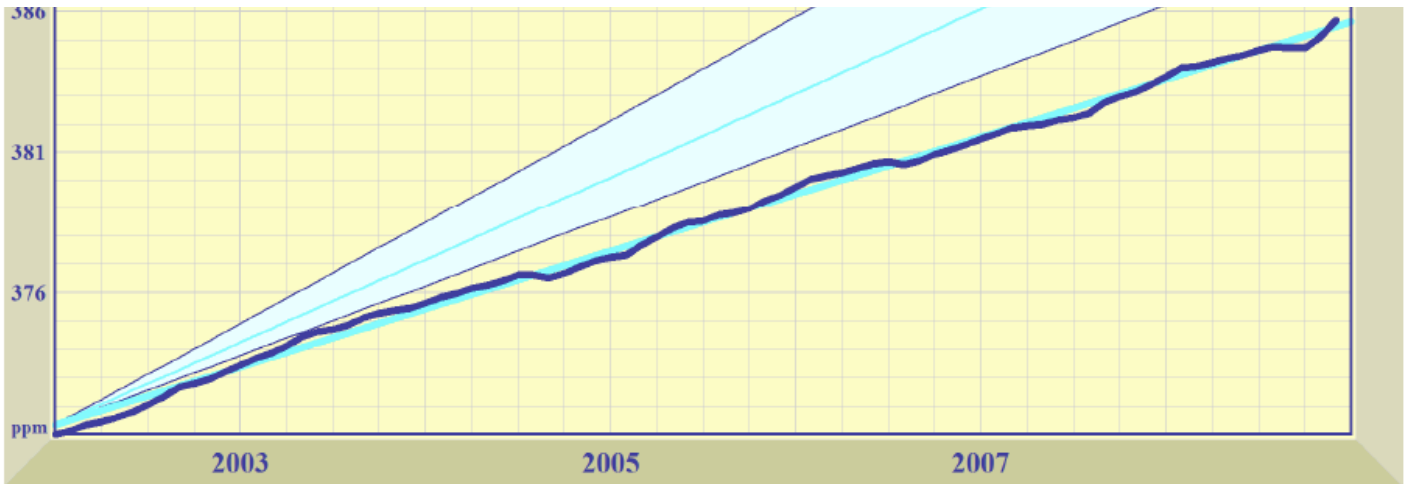
Lord Monckton's famous graphs have been puzzling me--especially the strange graphs of atmospheric CO2 concentrations that he shows at his presentations. I already posted an article from Science that said (at the time of publication) the CO2 concentration in the atmosphere was a little above IPCC projections. However, Monckton's graphs showed CO2 concentrations below the IPCC projections. He claimed he was basing his data for the IPCC projections on the A2 emissions scenario. Well, at Lord Monckton's suggestion I found the published source of his graphs, Monckton's "CO2 Report" that he publishes for the SPPI. Here is a link to the article and the graphs in question clipped from it.

http://scienceandpublicpolicy.org/images/stories/papers/originals/feb_co2_report.pdf



Observed CO2 growth is linear, and is also well below the exponential-growth curves (bounding the pale blue region) predicted by the IPCC in its 2007 report. If CO2 continues on its present path, the IPCC's central temperature projection for the year 2100 must be halved. Data source: NOAA.



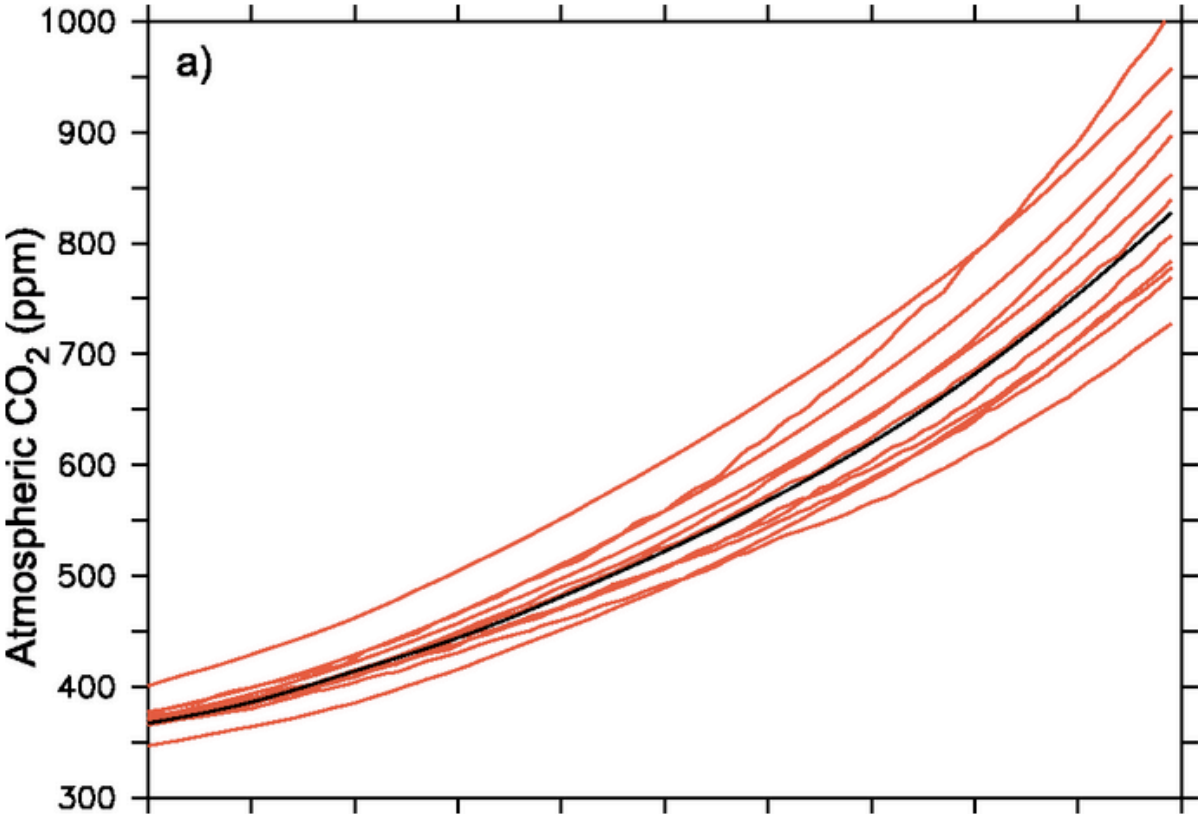


CO2 is rising in a straight line, well below the IPCC's projected range of increases in CO2 concentration (pale blue region). The deseasonalized real-world data are shown as a thick, dark-blue line superimposed on the least-squares linear-regression trend. Data source: NOAA.

(Note: The graphs say they are presenting global CO2 "anomalies," but in fact the raw concentrations are plotted.)

The dark blue, thick lines in both graphs show the actual CO2 concentrations (with some smoothing to get rid of seasonal cycles.) I checked this data at the NOAA website, and it is correct. However, almost everything else on the graphs is fabricated.

In the text of his "CO2 Report," Lord Monckton says, "The IPCC's estimates of growth in atmospheric CO2 concentration are excessive. They assume CO2 concentration will rise exponentially from today's 385 parts per million to reach 730 to 1020 ppm, central estimate 836 ppm, by 2100." I used a graph digitizing program to extract all the curves on this graph, and found that 730, 836, and 1020 ppm are, indeed, the endpoints of the IPCC Fantasy Projections on the graph that covers 2000-2100. From where did he get these numbers? I found the answer in Fig. 10.20 of the IPCC Report (AR4 WG1). Here it is.



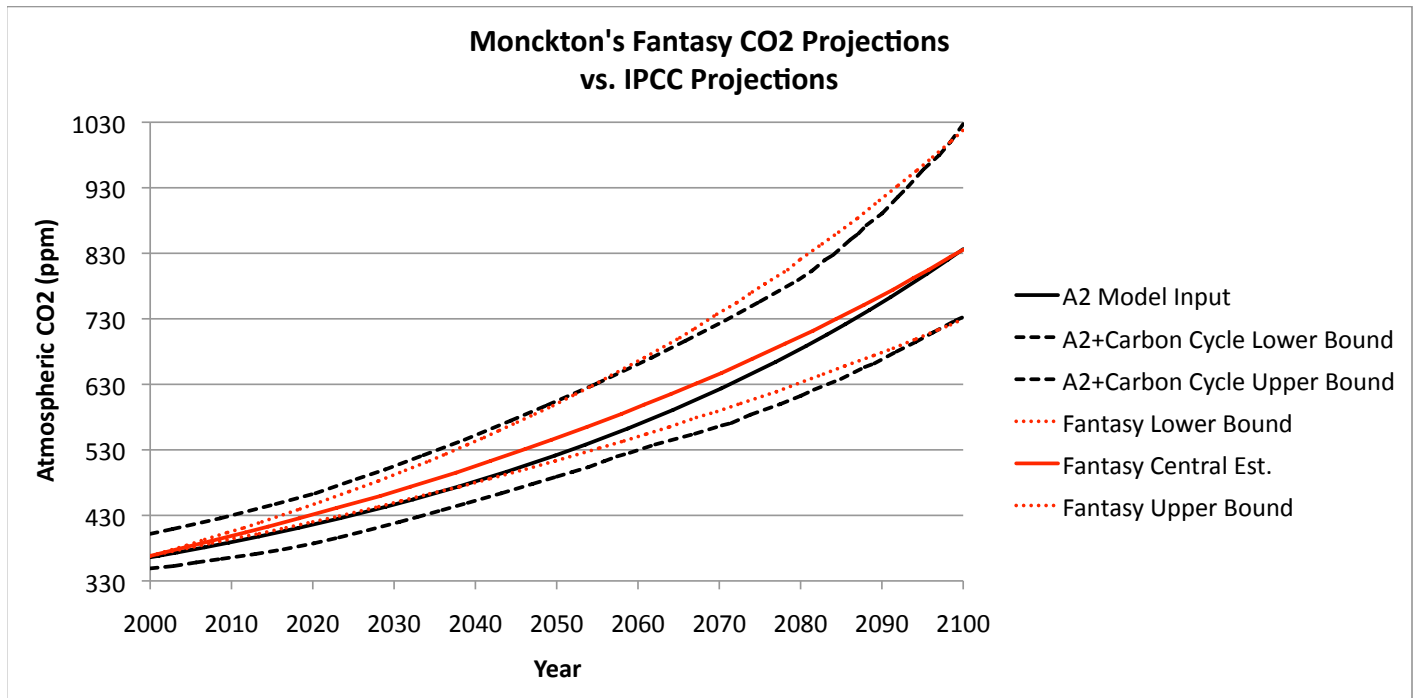
2000 2020 2040 2060 2080 2100

Figure 10.20. (a) 21st-century atmospheric CO₂ concentration as simulated by the 11 C⁴MIP models for the SRES A2 emission scenario (red) compared with the standard atmospheric CO₂ concentration used as a forcing for many IPCC AR4 climate models (black). The standard CO₂ concentration values were calculated by the BERN-CC model and are identical to those used in the TAR. For some IPCC-AR4 models, different carbon cycle models were used to convert carbon emissions to atmospheric concentrations. (b) Globally averaged surface temperature change (relative to 2000) simulated by the C⁴MIP models forced by CO₂ emissions (red) compared to global warming simulated by the IPCC AR4 models forced by CO₂ concentration (black). The C⁴MIP global temperature change has been corrected to account for the non-CO₂ radiative forcing used by the standard IPCC AR4 climate models.

Here's how this figure came about. The IPCC scientists took the A2 emissions scenario and ran it through a bunch of models of the Carbon Cycle to estimate what the atmospheric CO₂ concentrations would be. The red lines indicate the results of these model runs. The black line represents the "representative" CO₂ concentration resulting from the A2 emissions scenario that the IPCC chose to use as input for the climate model runs. That's right, the black line represents the ACTUAL INPUT to the climate models for the A2 emissions scenario.

I digitized the black line and the upper and lower red lines, and found that the endpoints at the year 2100 were within a small fraction of a percent of 730, 836, and 1020 ppm. Obviously, this is where Monckton got the IPCC projections for CO₂ concentrations in the year 2100, but what about all that time in between? Monckton's fantasy version of the IPCC projections begins at a single point in the year 2000 that doesn't even intersect with the real data. Instead, it intersects with the trendline he drew through the data. However, the range of projections in the year 2000 in the real IPCC graph don't intersect at a point.

Here is a graph I made that shows the A2 model input and the upper and lower bounds of the CO₂ projections from IPCC Figure 10.20. I also plotted the lines Monckton drew for the upper bound, lower bound, and central tendency of his Fantasy IPCC projections.



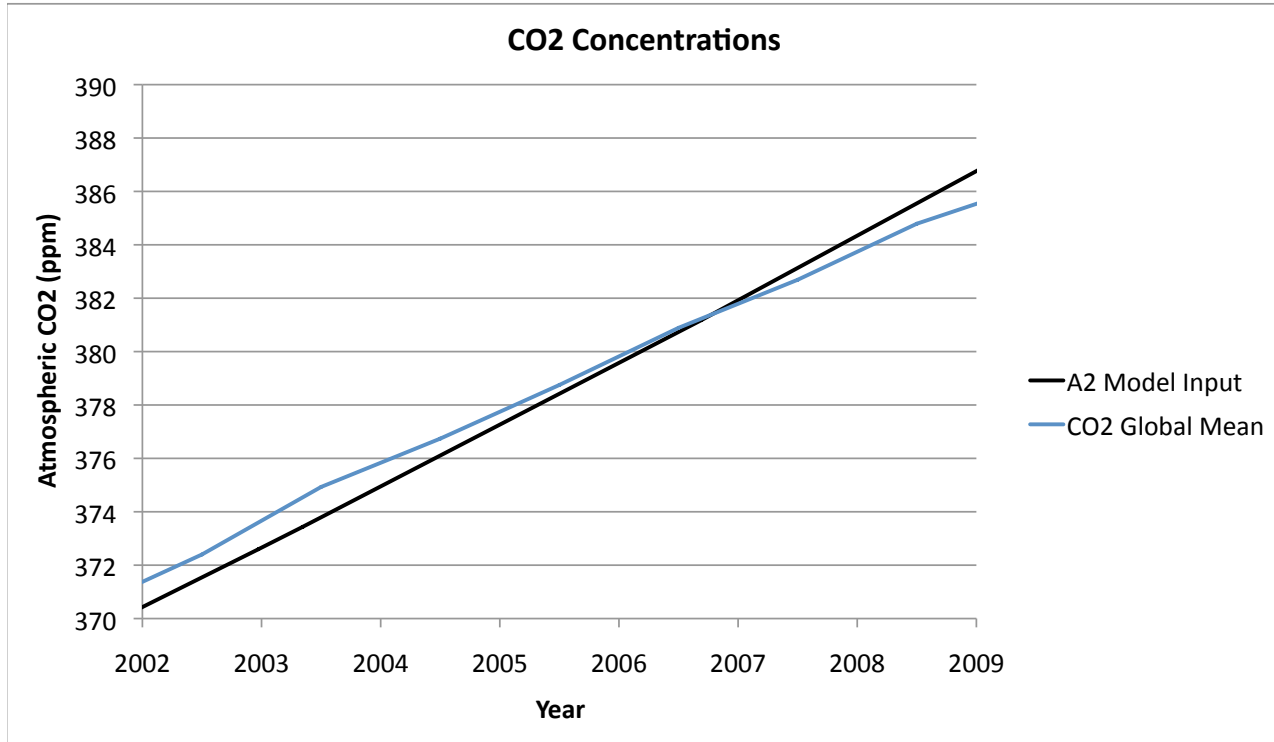
The first important thing to notice here is how badly Monckton's central tendency fits the actual A2 model input everywhere in between the endpoints. Monckton's central tendency ALWAYS overpredicts the model input except at the endpoints. Furthermore, the lower bound of Monckton's Fantasy Projections also overpredicts the A2 model input before about the year 2030.

What appears to have happened is that Lord Monckton chose the correct endpoints at 2100, picked a single endpoint at the year 2000, and then made some exponential equations to connect the dots with NO REGARD for whether his lines had anything to do with what the IPCC actually predicted anywhere between. The IPCC's real A2 model input curve is, indeed, exponential. I actually fit an exponential curve to it that reproduced the curve perfectly. However, Monckton apparently did not fit his curve to the data, aside from a single endpoint.

Another important thing to note is that the curves in IPCC Fig. 10.20 are not "predictions" of future CO₂ concentrations, per se. They are model

projections of the CO2 concentrations that might result IF THE A2 EMISSIONS SCENARIO IS FOLLOWED. Since the IPCC uses several other representative emissions scenarios, most of which involve lowered emissions over time, especially toward the end of the century, it seems very strange to speak of how closely we are following the IPCC's "predictions."

The consequences of making up his own equations for the A2 emissions scenario become more apparent when Monckton does a close-up of the CO2 data and projections in the second figure above, for the period 2002-2009. When I graph the CO2 data over this period along with the ACTUAL A2 model input, it is apparent that the CO2 concentration has been following the A2 scenario pretty well.



In his "CO2 Report," Lord Monckton goes on to say, "However, for seven years, CO2 concentration has been rising in a straight line towards just 575 ppmv by 2100. This alone halves the IPCC's temperature projections. Since 1980 temperature has risen at only 2.5 °F (1.5 °C) per century." In other words, he fit a straight line to the 2002-2009 data and extrapolated to the year 2100, at which time the trend predicts a CO2 concentration of 575 ppm. In one of his e-mails to us, Monckton defended his contention that the 2002-2009 data show a linear, rather than exponential rise in CO2.

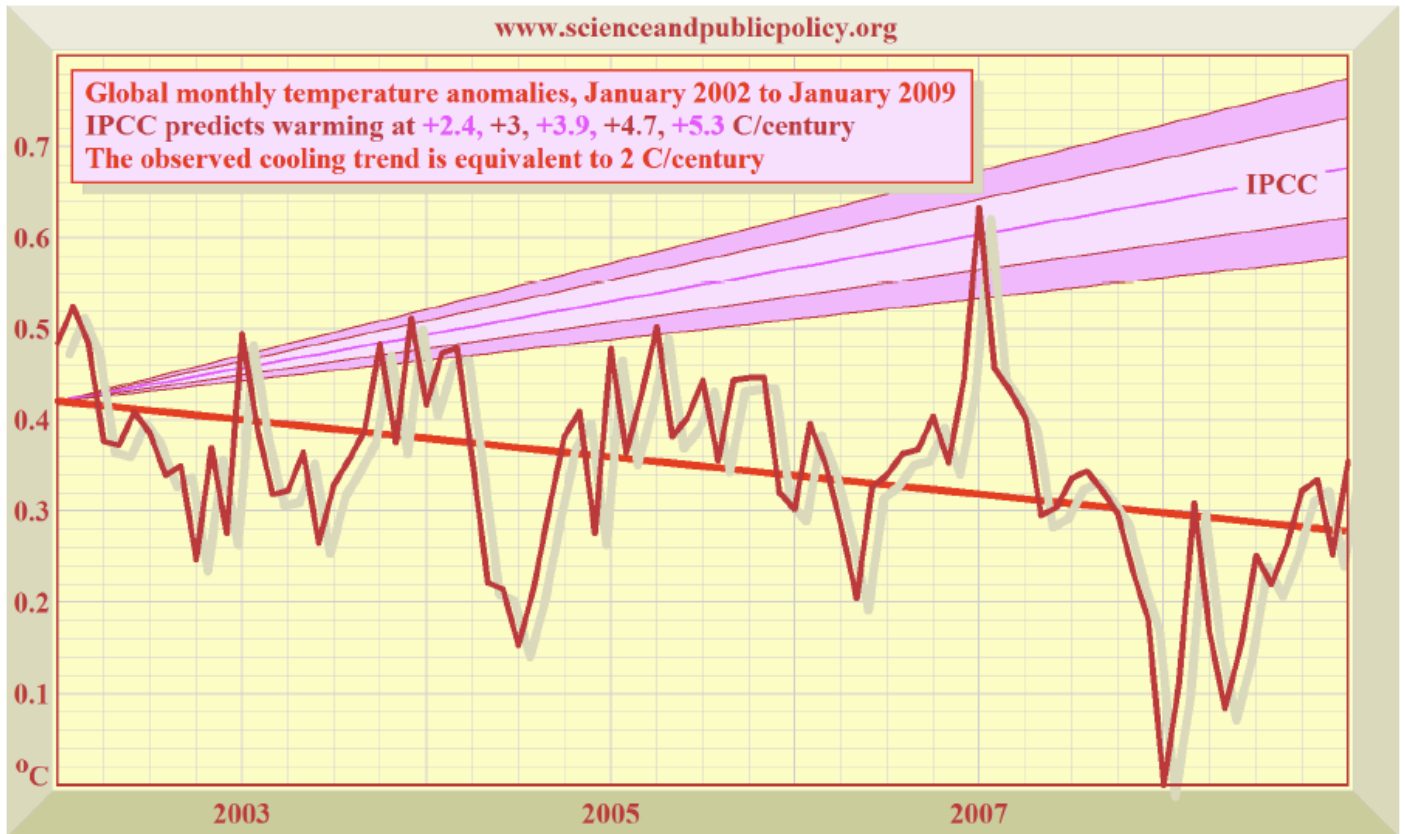
I am, of course, familiar with the fact that, over a sufficiently short period (such as a decade of monthly records), a curve that is exponential (such as the IPCC predicts the CO2 concentration curve to be) may appear linear. However, there are numerous standard statistical tests that can be applied to monotonic or near-monotonic datasets, such as the CO2 concentration dataset, to establish whether exponentiality is being maintained in reality. The simplest and most direct of these is the one that I applied to the data before daring to draw the conclusion that CO2 concentration change over the past decade has degenerated towards mere linearity. One merely calculates the least-squares linear-regression trend over successively longer periods to see whether the slope of the trend progressively increases (as it must if the curve is genuinely exponential) or whether, instead, it progressively declines towards linearity (as it actually does). One can also calculate the trends over successive periods of, say, ten years, with start-points separated by one year. On both these tests, the CO2 concentration change has been flattening out appreciably. Nor can this decay from exponentiality towards linearity be attributed solely to the recent worldwide recession: for it had become evident long before the recession began.

That's very nice, but as I noted above, the A2 emissions scenario is just a scenario, after all. It is not a "prediction" of future CO2 concentrations. Furthermore, in the graph above the ACTUAL A2 scenario model input is EXPONENTIAL. Can you tell? Neither can I. In fact, over this short time period I fit a linear trendline to the A2 model input and the correlation coefficient (R-squared) was 0.99967. Since real data is inherently more noisy, I submit that Monckton's "statistical tests" to separate a linear trend in noisy, real data from an exponential curve like the one used as model input for the A2 scenario are meaningless. In fact, if I extrapolate the trendline I fit to the A2 model input out to the year 2100, the predicted CO2 concentration is 597 ppm, not very different from the 575 ppm Monckton got by extrapolating the trendline he fit to the 2002-2009 CO2 data.

To summarize, Lord Monckton's treatment of CO2 projections is very strange. He simply makes up equations to describe the A2 emissions scenario, whose only real connection with reality is that they run through the proper endpoints in the year 2100. The exponential equations he makes up ALWAYS overpredict the actual A2 model input, except at the year 2100. Real CO2 concentrations reproduce the A2 model input very closely for the period 2002-2009, and the A2 model input is indistinguishable from a linear trend during this period.

But that's not all. Lord Monckton says that he fed his Fantasy CO2 projections into the IPCC's exponential equations for equilibrium temperature response to CO2 forcing to produce his famous temperature graphs, like the following. If that's true, then the temperature graph is worse than I thought!

Not only is equilibrium temperature response improperly compared to the real, transient response, but the calculated equilibrium temperature responses are based on Monckton's Fantasy CO2 projections, which are ALWAYS too high in 2002-2009!



For the past seven full years, global temperatures have exhibited a pronounced downtrend. The IPCC's predicted warming path (pink region) bears no relation to the global cooling that has been observed in the 21st century to date. Source: SPPI global temperature index.

I don't know about any of you, but I think I deserve a 1,000,000 pound prize for unraveling that mess.

Barry Bickmore