The Crux of the Issue: Climate Sensitivity Factor

Every scientific theory involves assumptions. Global warming theory starts with the assumption that the Earth naturally maintains a constant average temperature, which is the result of a **balance** between (1) the amount of **sunlight the Earth absorbs**, and (2) the amount of **emitted infrared ("IR")** radiation that the Earth continuously emits to outer space. In other words, energy in equals energy out. Averaged over the whole planet for 1 year, those energy flows in and out of the climate system are estimated to be around 235 or 240 watts per square meter.

Greenhouse components in the atmosphere (mostly water vapor, clouds, carbon dioxide, and methane) exert strong controls over **how fast the Earth loses IR energy** to outer space. Mankind's burning of fossil fuels creates more atmospheric carbon dioxide. As we add more CO_2, more infrared energy is trapped, strengthening the Earth's greenhouse effect. This causes a **warming tendency in the lower atmosphere and at the surface**. As of 2008, it is believed that we have enhanced the Earth's natural greenhouse effect by about 1%.

Global warming theory says that the lower atmosphere must then respond to this energy imbalance (less IR radiation being lost than solar energy being absorbed) by causing an **increase in temperature (which causes an increase in the IR escaping to space**) until the emitted IR radiation once again equals the amount of absorbed sunlight. That is, the Earth must increase its temperature until global energy balance is once again restored. **This is the basic explanation of global warming theory.** (The same energy balance concept applies to a pot of water on a stove set on "low". The water warms until the rate of energy loss through evaporation, convective air currents, and infrared radiation equals the rate of energy gain from the stove, at which point the water remains at a constant temperature. If you turn the heat up a tiny bit more, the temperature of the water will rise again until the extra amount of energy lost by the pot once again equals the energy gained from the stove, at which point a new, warmer equilibrium temperature is reached.)

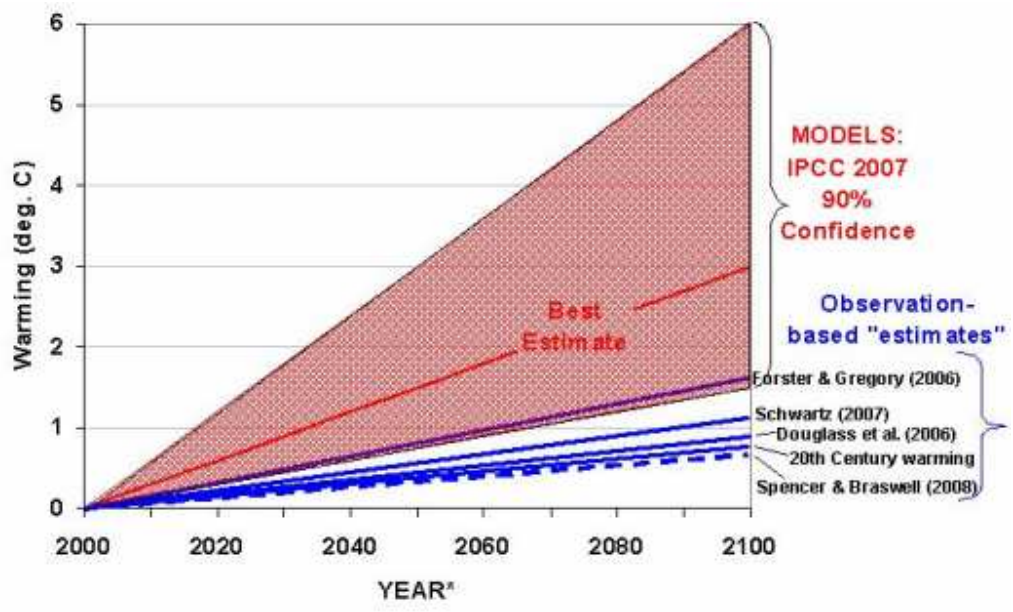
Now, you might be surprised to learn that the **amount of warming directly caused by the extra CO_2 is, by itself, relatively weak** (See the plot at end). It has been calculated theoretically that, if there are no other changes in the climate system, a doubling of the atmospheric CO_2 concentration would cause less than 1 deg C of surface warming (about 1 deg. F). This is NOT a controversial statement…it is well understood by climate scientists. (As of 2008, we were about 40% to 45% of the way toward a doubling of atmospheric CO_2.)

BUT…everything else in the climate system probably WON'T stay the same! For instance, clouds, water vapor, and precipitation systems can all be expected to respond to

the warming tendency in some way, which could either amplify or reduce the manmade warming. These other changes are called “feedbacks,” and the **sum of all the feedbacks** in the climate system determines what is called ‘**climate sensitivity’**. Negative feedbacks (low climate sensitivity) would mean that manmade global warming might not even be measurable, lost in the noise of natural climate variability. But if feedbacks are sufficiently positive (high climate sensitivity), then manmade global warming could be catastrophic.

Obviously, knowing the strength of feedbacks in the climate system is critical. Unfortunately, the IPCC has choosen to determine this most critical factor by taking an opinion poll. Opinion polling is not the methodology of “science”; even if you are polling scientists. It does not even qualify as a controlled experiment. See the analyses and the plot below to see some weaknesses of the anthropogenic global warming models.

: Statistical_Test_of_Global_Warming_Hypothesis.pdf and
Critical_GHG_Concentration_Trends.pdf



A classic dispute between rationalism and empiricism? We need to have rational approaches, based in models, but models need to be ruthlessly eliminated by evidence. The good models sit at the intersection of the larger sets of plausible dynamic models, and sets of empirically-fit models. Sure there may be things about low climate sensitivity that cannot currently be explained. The intersection of low sensitivity and high natural variability, as recently described by Spencer, have not been decisively eliminated by observations. The high sensitivity models with low natural variability have.