On Science Insider (subscription required), Eli Kintisch reports on two new scientific studies that together spell bad news for our ability to address the greenhouse gas problem.

The first is a computer simulation of the effect on global CO2 levels if developed nations adopt the most aggressive greenhouse gas emission reductions they have proposed or committed to — including 80% below 1990 levels by 2050 in Europe and the U.S. The authors find that even with those cuts, if China and India continue on a business as usual path, CO2 levels will "continue to rise throughout the century and reach approximately 730 ppm by 2100," producing a roughly 3° C (5°F) temperature increase in that time. Keep in mind that many scientists think that CO2 levels must be stabilized at no more than 450 ppm to avoid catastrophic climate change.

The second study (subscription required) was published this week in Proceedings of the National Academy of Sciences, reports the results of a survey of expert's beliefs about the probability of occurrence of several climate "tipping points," including the shutdown of the Atlantic Ocean Meridional Overturning Circulation; melting of the ice sheets in Greenland and the West Antarctic; loss of 50% or more of the Amazon rainforest; and a shift to a persistent El Nino regime. The authors found that many experts were highly uncertain about their estimates, and those estimates varied a great deal between experts. Nonetheless, taking the lower boundaries of the estimated risks, the experts assigned a roughly two-thirds chance that at least one important tipping point will be crossed in a mid-range temperature scenario — where temperatures increase 2-4° C in the next century, or just about what the first simulation study predicts is the likely outcome of current policy proposals.

As Kintisch summarizes the two studies, "It comes down to society's level of comfort with danger. Are you comfortable with a one-in-six chance of losing Greenland?" That's the way experts see the risk, even if developed countries actually achieve their most aggressive emission reduction proposals.