

Meeting that 1.5 degree goal could be a pipe dream

Michael Le Page, New Scientist, 23/9/17

The Paris Agreement aspires to limit global warming to 1.5 degrees above pre-industrial levels. But is this target at all realistic?

Climate scientists had estimated that this means we can emit no more than 70 gigatonnes of carbon (GtC) after 2015. At current emission rates, we will pass this threshold by 2022.

Now a study is claiming that we can emit 200 GtC - nearly three times as much, pushing the deadline back to 2035. 'Keeping to 1.5 [degrees] just went from impossible to very difficult,' says team member Joeri Rogelj at the International Institute for Applied Systems Analysis in Austria.

Is the team right? The first issue is how you define the pre-industrial temperature. The study uses the period 1861 to 1880, when we start to have decent temperature measurements. The UK Met office's record of average global surface temperatures suggests the 2010s will be 0.9 degrees C above this period, leaving only 0.6 degrees of wiggle room.

But there had already been about 0.2 degrees of warming by 1870, according to Michael Mann of Penn State University, which would mean there is just 0.4 degrees to go. 'When a proper pre-industrial baseline is used, 1.5 degrees is virtually impossible,' he says.

Then there is the issue of why this study gives a much larger carbon budget. The team says it relied on improved climate models and more recent data (Nature Geoscience, D01:10.1038/NGEO3031).

However, the results have left other researchers scratching their heads, says Gavin Schmidt for Space Studies in New York. 'I can tell you that lots of people are emailing around trying to work out why these numbers are so much higher than previous ones.'

'I am quite nervous there will be headlines that we have a significantly larger budget for 1.5 degrees,' says Glen Peters of the Center for International Climate Research in Norway. 'But I think we need to have more studies confirm that.'

Even if the new study is right, limiting emissions to 200 GtC still only gives us a 66 per cent chance of limiting warming to 1.5 degrees, it finds.

But even the best models leave out slower feedback mechanisms that lead to more warming, such as methane emissions from a melting Arctic. It is quite possible the models underestimate future warming.

In any case, it doesn't matter. We are already on course to exceed 200 GtC. Although coal use is down, rising oil and gas use mean we are still emitting record levels of carbon dioxide.

Even if renewables grow ever faster, getting total emissions down to zero is going to be tough. Sectors like aviation and farming are producing ever more emissions that will be very hard to tackle. Discussing the carbon budget for 1.5 degrees may be like asking how many angels dance on a pin.

The authors of the paper say they hope the findings will inspire people to redouble their efforts to meet the Paris Agreement's goal. Maybe. But the danger is that when the planet crosses this threshold in the next decade or three - which it will using Mann's definition of pre-industrial - people will give up hope. We are likely to zoom past 2 degrees too - surprisingly, having a larger budget for 1.5 degrees does not mean we have a larger budget for 2 degrees.

A simpler message might be better: the more we all do to limit emissions, the better off we will all be.