

Climate Change and Construction: The Latest Science

Climate change is a topic that should be dominating our discussions both as individuals, and as professionals involved in the construction industry. Yesterday’s release of the long-awaited IPCC report* on the latest science globally is, as anticipated, a wake-up call.

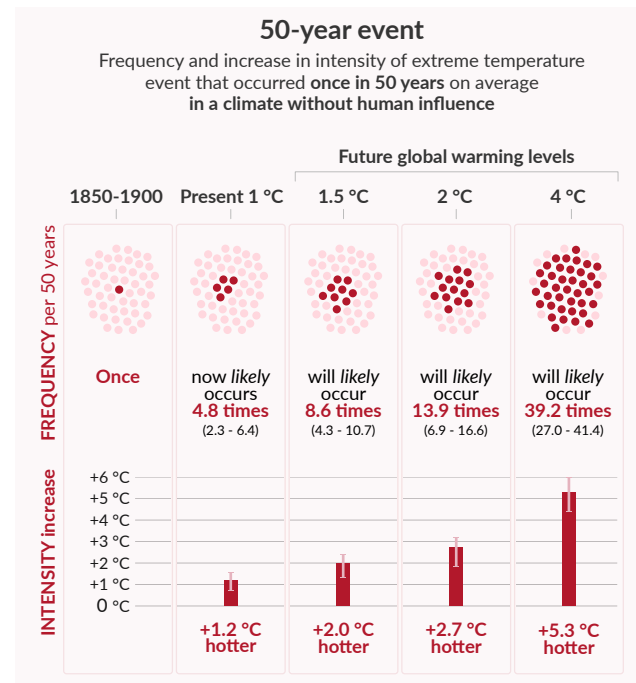
The report is well worth a read in full, or at least the summary for policy makers if you are short of time – the latter is a snip at 39 pages, rather than the 1800+ pages of the full document. A happy half-way house is the Technical Summary at 150 pages. While there is a risk of cherry-picking a favourite hobby horse from what is a very complete piece of scientific reporting, below we will highlight one aspect of the report, the aspect of risk.

We all have some intuitive understanding of risk – assessing it, and hopefully minimising risk, or living with it, and of course the Covid-19 pandemic has brought the issue of collective risk to the fore like never before. The difficulty is distilling any real sense of risk from the climate change headlines, and then agreeing what to do to manage or minimise that risk.

Through the Paris Agreement, the nations of the world are, at least theoretically, committed to leaving behind a 1.5°C (or less) warmer world to our descendants in 2100 and beyond. But at the same time, we are having to consider the possibility that the world will be considerably warmer than this – perhaps 3°C, perhaps as much as 4°C.

But how much risk does this present to us? Is 4°C representative of a world that is 4 times as risky as a 1°C world? And if so, what risk?

Below is a single graphic from the report (SPM-23), which presents the proportions of risk. Inevitably, it leaves out some details, but these can be picked up from reading the report yourself.



This graphic describes modelling of extreme temperature events that historically would have occurred every 50 years – i.e. once in the period 1850-1900. These are then taken as representatives of the climate before human intervention. This is measured using daily maximum land temperature on a 1/50 statistical basis.

* IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change <https://www.ipcc.ch/report/ar6/wg1/>

The headline summary for us is stark:

An extremely hot weather event that our Victorian ancestors would have experienced just once in 50 years is already likely to happen nearly 5 times in 50 years in today's climatic conditions

This 5X risk jumps to ~9X under the 'safe' outcome of 1.5°C warming that we are all trying to achieve, ~14X under 2°C and a frankly terrifying ~40X likelihood under a 4°C warming scenario

In all the warming scenarios, the event is not just occurring more frequently, but with greater intensity too

While it is hard to intuitively quantify, it turns out that the slightly banal 1.5C and 2C targets we hear discussed so frequently are hiding very large risks behind them, whose marginal increase is vast for every increment in warming. Far from a 4°C world being 4X as risky at a 1°C world, it is something like 40X as risky – likely considerably more, when you allow for intensity as well as frequency.

So we are already in a riskier world, and to prevent it getting multiple times worse, we need to stick to the 1.5°C target with the greatest commitment we can muster. This level of warming correlates with the lowest warming scenario that the IPCC considers: the SSP-1-1.9.

This scrapes a 'pass' of the Paris Agreement with a warming of 1.4°C (+/-0.4°C) in 2100.

So, what do we need to do to achieve the catchily titled SSP1-1.9? Unsurprisingly, we need dramatic cuts in global CO₂ emissions every year from now to 2050, at which point we will be close to, or at, global net zero emissions of CO₂. Other greenhouse gases (GHGs) also have to decline precipitously in the years ahead. These cuts must start now, we must remain positive and optimistic about our chances of hitting our Paris targets, as the alternative is, scientifically speaking, disastrous.

While there are many levels of action against climate change, and towards a 1.5°C limit to warming, by far the most powerful change is big reductions in CO₂ emissions. Thankfully, in the UK construction industry, we already have a skilled and motivated workforce (though further training is urgently needed) and an excellent range of tools and targets to achieve and exceed net zero. It is now a matter of applying them universally and quickly to all projects. Getting the embodied and operational CO₂ emissions of all our projects down below zero is the urgent and present challenge of our professional lives, and one that I trust we will rise to with excellence in 2021 and the years ahead.

On our website you can take a look at our previous and current projects, resources, and contact us to see how we can help your projects achieve and exceed net zero carbon and have resilience to the changing climate of today and the future.

Further reading and resources:

- UKGBC: <https://www.ukgbc.org/ukgbc-work/net-zero-carbon-buildings-a-framework-definition/>
- RIBA: <https://www.architecture.com/about/policy/climate-action/2030-climate-challenge>
- LETI: <https://www.leti.london/cedg>
- RICS: <https://www.rics.org/uk/news-insight/future-of-surveying/sustainability/>