**In October twenty-twenty-three we took a look at some new analysis by a team of experienced climate scientists and actuaries who had got together to apply the hard-nosed, real-world principles of financial risk management to the rather more cautious and consensus driven world of climate projection.**

**The report made for a pretty stark juxtaposition of approaches that suggested that the climate bods were being a bit hamstrung in their efforts to highlight the seriousness of our situation by policy makers who essentially didn’t want to overly concern their citizens and cause them to vote for someone else who might tell them a nicer story.**

**Well, now that original piece of work has been followed up by this latest report which adds a bit more context and colour to the actuarial appraisal.**

**And the conclusions are…challenging!**

**Before we get stuck in though, make sure you stick around to the end of the video to find out how you can get your exclusive Just Have a Think discount on tickets for the upcoming Everything Electric LIVE event in Harrogate.**

**Hello and welcome to Just Have a Think.**

**For this latest piece of work, two of the original paper’s authors, Sandy Trust and Timothy Lenton have been joined by Actuary and Chair of the Resources and Environment Board, Oliver Bettis, Deloitte Sustainability Actuary, Lucy Saye, UK Government Actuary, Georgina Bedenham, Exeter University Maths and Stats PhD Grad, Dr Jesse Abrams and Dr Luke Kemp, Senior Research Associate at the Notre Dame Institute of Advanced Studies.**

**In the previous video we took a deep dive into the differences between actuarial conservatism and climate science conservatism, and we discovered the potential dangers of scientific averaging when it comes to climate modelling, so I won’t go back over that here, but if you haven’t seen that video then it’s worth watching it first because it provides the context for what we’ll talk about today. You can do that by clicking up there somewhere, or by following the link in the description section below.**

**The authors of this latest research point out that the rate of global warming accelerated in twenty-three, and despite a well-publicised El Nino event during that time, there are nevertheless some early indications that the acceleration is not temporary.**

**This chart shows monthly temperature anomalies relative to pre-industrial levels from nineteen-forty to today. The last record El Nino year was twenty-sixteen, and you can clearly see a spike up well above one-point-five degrees Celsius in February of that year. But then temperatures settled back down again towards June and stayed relatively flat thereafter. That didn’t happen in twenty-twenty-three though. Temperatures reached about one-point five degrees Celsius in March last year and then just kept going. It’s really not clear at this stage whether that rise will also settle down or whether we’ve reached a new baseline for warming, in which case the climate models need to be revised, and so do our global mitigation and adaptation policies.**

**Climate risks are increasing globally, say the paper’s researchers, and events that used to be regarded as very rare are now becoming increasingly common. This chart from the website Carbon Brief, shows all the extreme weather events that are being exacerbated by climate change all over the planet. Anything in red has the tell-tale fingerprint of human influence, so, you know, the vast majority basically.**

**According to the consultancy firm Verisk, total global economic losses from these events now average four-hundred-billion US dollars a year with a likelihood that future infrastructure losses will be in the region of a trillion dollars annually, with as little as a quarter of that being covered by any kind of insurance.**

**Actuaries tend to use charts like this one to provide strong visualisation of where we’re currently at. This blue curve represents the probability of severe flood events back in nineteen-eighty. It’s your classic normal distribution curve really. So, the most severe flooding events are all in this tail bit over here on the extreme right-hand side – 4:08 in other words, not impossible, but very unlikely to happen. 4:13 And here’s where the world is projected to be in twenty-thirty. What was the extreme tail fifty years previously will be right slap bang in the middle of the curve by the end of this decade, and extreme events that weren’t even on the scale of possibility when I was just starting out at high school are now in scope and represent a much more severe tail to the new curve.**

**One of the biggest concerns raised by this paper is the risk of climate tipping points. The authors highlight recent research by D Armstrong McKay et al suggesting that climate tipping points may be triggered at lower temperatures than previously estimated, with several at risk in the one-point five to two degrees range that we’re now entering. Things like ice loss in Greenland, West Antarctica and the Himalayas, permafrost melt, Amazon die-back and the halting of major ocean current circulation are projected to interact, causing a very unwelcome cascade effect that could be irreversible.**

**From an actuarial point of view these things can no longer be considered as high-impact, low-likelihood TAIL RISK events, but should instead be factored into risk assessments as high impact, high-uncertainty and increasingly likely events.**

**Actuaries are acutely conscious of something called ‘model risk’, either as a result of using completely the wrong model in the first place, which I would characterise as total muppetry, or using the right model but implementing it in the wrong way, which reminds me of dear old Eric Morecombe,**

**“I was playing all the right notes. Not necessarily in the right order!”**

**or simply misinterpreting the data that the model provides.**

**If you’re a bean counter or a risk assessor, then an estimated probability that turns out to be lower than the real probability is a way bigger problem than an estimated probability that’s higher than reality. So, actuaries tend to make conservative, worst-case estimates, with the word ‘conservative’ in this case meaning ‘conserving’ their clients’ money. Conservative estimating in climate science, by stark contrast, means using the lowest common denominator of data averaging based on geo-political consensus.**

**If political action on climate was instead decided from the perspective of financial solvency, the first question would not be ‘what’s the least bad thing we can we get away with telling our public?”. It would be “how bad could it get”?**

**Under the European Solvency regime, insurance companies are required to hold enough capital to survive an unlikely BUT POSSIBLE one-in-two-hundred-year set of adverse events. This paper’s authors strongly suggest that society as a whole might reasonably expect a similar standard from our global leaders when it comes to climate mitigation and adaptation policies.**

**Essentially what these industry and climate experts are saying is that planetary warming above one-point-five degrees Celsius is dangerous. Not to the planet obviously – the planet will be fine, so we can all put away our ‘Save the Planet’ placards because that is most definitely NOT what we’re talking about here.**

**We’re talking about the existential risk to life ON the planet, not the planet itself, which will keep rotating and recalibrating its balancing systems over geological timescales for several billion more years whether we and all of Earth’s other species are still breathing or not.**

**The point is we humans have never, in all our history, ever known the planet at the levels of warming that are coming our way in the next seventy years and beyond. All these intricately interconnected functions and consequences are being tested and stressed in ways that we simply have no precedent for, or experience of, and currently no mechanism for dealing with on any kind of globally coordinated basis. Right now, this report suggests, we’re metaphorically sleepwalking blindfolded with our arms tied behind our backs into an arena filled with very hungry lions.**

**So, how do we take the blindfold off and untie ourselves then? I hear you cry! Well, a proper, realistic climate risk assessment is urgently needed according to the paper’s authors. Maybe get the insurance risk assessors to do it instead of the political leaders, eh? That way we might all be provided with a slightly clearer picture, albeit a more terrifying one. The authors suggest using a financial risk management technique called reverse stress testing, where insurance companies ask themselves the simple question “What would ruin us?” and work out their action plans from there.**

**The paper also concludes that we desperately need a mechanism that enables long-term policy decisions –and ideally not one that involves an autocratic dictatorship. The authors’ solution to that conundrum is something they call a Planetary Solvency Commission.**

**So, what do they mean by that then?**

**Well, to quote them directly**

 **“Risk management techniques from a variety of disciplines should be used to develop a global risk management framework that explores the interconnected societal, natural, climate and economic risks we face, and recommends actions to address them.”**

**“Planetary Solvency should be complemented with long-term governance and risk management. This could include radical actions to reduce global temperatures and govern large-scale displacement. These need to be undertaken carefully, democratically, and through holistic risk assessments, for example comparing the risks of unmitigated climate change versus geoengineering.”**

**Now, of course there’s a great deal of data and commentary in the rest of this report that put a lot more flesh on the bones of the bullet points I’ve highlighted today, and far more than we could hope to cover in a short little video like this,**

 **but I’ve left a link to the paper in the description section below so you can take a deeper dive if you wish, and of course if you have direct experience of working with financial or climate risk assessment or if you just feel the need to express your view on the subject, then as always, the place to leave your thoughts is in the comments’ section below.**

**That’s it for this week though folks, but I before I go, I must just let you know that we‘re already hurtling towards the second Everything Electric show of the year! How time flies! The next event is being held at the well-established and much-loved Yorkshire Event Centre up in Harrogate from Friday 24th to Sunday 26th May. You never know, we might actually be having some decent weather by then, and the site has lots of outdoor space for a wider range of new electric vehicles to be on show and of course with the usual attractions for families and space for the kids to run around and have a bit of fun. I’ll be hosting another six discussion panels too, so it’d be great to see you if you can make it. The discount code for Just Have a Think viewers is still valid, and I think it’s being displayed on the screen right now along with the website where you can grab your tickets. There’ll also be a link to that website on the end screen of this video and in the description section below. Harrogate is a popular one folks, so if you are thinking of coming along, I would recommend grabbing your tickets early, and I’ll hopefully see you there.**

**That just leaves a massive thank you, as always, to my friends over at patreon.dot.com forward slash just have a think, who help this channel stay independent, and a big thank you to you for watching up until now. If you liked this video and want to keep up to date on new content, then don’t forget to hit the subscribe button and the notification bell. That way you don’t miss out, and you‘ll be massively helping the channel get in front of the dreaded algorithm. Whichever way you choose to support the channel, though, that support is absolutely crucial and very much appreciated.**

**So, have a great week, and remember to just have a think.**

**See you next week**