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Headline: Climate forensics is fast and accurate. Now what?

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The guilty verdict came fast. Ten days after a record 40 degrees Celsius heatwave swept over London, researchers concluded that the chance of such high temperatures in a region known for dull, drizzly weather was made 10 times higher by man-made global warming.

The event was also either two or four degrees Celsius hotter because of climate change, depending on whether statistical models or historical records were the basis of comparison, according to climate science group World Weather Attribution.

The group has been analysing extreme weather events since 2014. The mid-year hot spell in India and Pakistan was 30 times more likely because of global warming, it found. The probability of a 2018 drought in South Africa was tripled by man-made emissions. Last year's North America heatwave was deemed "virtually impossible" without human influence.

Scientists have long been advocating a nuanced understanding of the effects of climate change, in response to both a concerned public facing increasingly bad weather events, and climate deniers scoffing that bouts of snowstorms rubbished greenhouse effect theory.

"No events are "caused by climate change" or global warming, but all events have a contribution. Moreover, a small shift in the mean [temperature] can still lead to very large percentage changes in extremes," wrote Dr Kevin Trenberth, lead author of major climate international change reports between 1995 and 2007, a decade ago.

But as climate science improved, scientists have been able to point the finger of blame with more confidence at climate change, where deserving, through the kind of simulations and studies experts at World Weather Attribution conduct.

Results from such studies go beyond the scientific realm and could influence key decisions in policymaking and the corporate world, experts say.

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Accountability

A more precise understanding of how global warming weighs on weather extremes could feed into calls by developing countries for the richer world to pay for their historical emissions, in a decades-long debate known as “loss and damage”, according to Winston Chow, associate professor at the College of Integrative Studies, Singapore Management University

“It is front and centre. The extreme weather that we have seen and will continue to see is going to make this conversation much more heated and much more topical for this coming Conference of Parties and the next one in Dubai,” Chow said, referring to the annual global climate change conferences that have produced landmark pacts such as the Paris Agreement.

Climate negotiators from many developing countries and island states have been working to include stronger loss and damage negotiations into the upcoming conference in November, to the objection of developed countries.

Recent events, such as the South Asia heatwaves this year, have contributed to the debate.

“In India and Pakistan, because of the extreme heat, there was a reduction in crop yield. Those are losses due to climate change and how the losses could be compensated is one of the big debates that we are having right now,” said Sandeep Chamling Rai, senior advisor for global climate adaptation policy at environmental group WWF International.

But weather attribution data will probably not turn the tables fast. Rai conceded that the technical aspects of climate risks are already well-understood by climate negotiators, and the conversation has taken a turn towards legalities and politics. Alain Mahieu, Asia Pacific sustainability solutions manager at consulting firm Engie Impact, said that world leaders are moving from focusing on past emitters to “forward-looking solutions”.

But extreme weather attribution could move the needle in the corporate world.

While businesses look more at projections of future climate risks than the specific causes of extreme events already past, firms could still be affected by how such events and their climate fingerprint swing investor and policymaker sentiment, Mahieu said.

“We are seeing more governments and citizens around the world mobilising to get businesses that are massive emitters to take action. For those heavy emitters not taking action, their social licence to operate may begin to be questioned,” he added.

There are already precedents. In 2019, environmental group Milieudefensie sued petrochemicals giant Shell for violating a “duty of care” under Dutch law by not taking adequate action to reduce its contributions to climate change.

The Hague District Court sided with Milieudefensie in calling for Shell to cut carbon emissions by 45 per cent by 2030, citing how studies have shown the increase in frequency and severity of weather disasters due to climate change. Shell said it would appeal the ruling, and has since shifted its headquarters out of the Netherlands into the United Kingdom.

“With more intense climate events happening, stakeholders are likely going to be a lot more critical when scrutinising your decarbonisation effort,” Mahieu said, adding that such “transition risks”, which also include changes in commodity prices and new technologies, could be “significantly higher” than direct climate impacts in the next decade.

Meanwhile, the insurance industry, which has been receiving ever larger bills from extreme weather events, is also looking at ways to price its services accurately.

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A survey by US-based credit rating agency S&P Global Ratings last year found that only a third of reinsurers, which are huge corporations that finance insurance firms, could say they had a specific portion of their pricing allocated for climate change, with such charges topping off at 10 per cent of the bill, a fraction that “does not appear to be a significant determinant of market pricing”, it said.

“From a reinsurance perspective, and from the private sector, how can we make the case that things that usually were “acts of God” within the realms of natural variability are no longer natural?” said Chow.

“The fine tuning of how impacts can be understood by different stakeholders, such as the finance sector, might get more mileage than it has now,” Chow said. Last year, the World Weather Attribution group found that 40 per cent of the US\$10 billion of insured losses from Typhoon Hagibis, which struck Japan in 2019, could be attributed to climate change.

Spurring action

“As extreme weather events become more frequent, the attribution framework is evolving from an academic exercise to an operational and advisory tool,” said Dr Mariam Zachariah, a research associate at the Grantham Institute for Climate Change, Imperial College London.

The World Weather Attribution initiative, which the Grantham Institute is part of, has been using its studies to call for more action.

“Heatwaves are almost like invisible disasters, invisible risk,” said associate professor Emmanuel Raju from the University of Copenhagen’s Centre for Disaster Research, who is a co-author of the World Weather Attribution report on the UK heatwave.

“It’s less spoken about, it’s less acted upon,” Raju said, during a press briefing on the paper, which also pointed out unequal access in London to shade and water, as well as existing health inequalities within ethnic minority groups.

Scientists from the World Weather Attribution group have also called out instances where climate change was erroneously blamed for disasters, such as the ongoing drought and food crisis in Madagascar, which researchers said was made worse by existing issues with transport infrastructure, poverty and Covid-19.

“It can be appealing for politicians to blame climate change alone for domestic disasters,” World Weather Attribution co-founder Friederike Otto had written in a commentary in non-profit publication Knowable Magazine.

“But there is also local responsibility, everywhere, for good governance, functioning infrastructure and warning systems,” she added.

Extreme weather attribution plays a key role in getting the general public on board with climate action too, according to Li Zhao, a senior researcher at environmental group Greenpeace East Asia.

“We quote extreme weather attribution to help people understand that human-induced climate change is leading to devastating results by scientifically demonstrating the frequency of extreme weather events,” Li said.

The value of the message does not go away even as extreme weather becomes more common, she said, as it takes time for the public to absorb the knowledge.

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“As far as I’m concerned, even if extreme weather events become a new norm, it is still of great importance to keep emphasising the message,” she said.

Rai said that using climate attribution as a communications tool may be more effective in places where the impacts are already keenly felt, compared to places like Singapore where the risks are relatively controlled and mild.

But with the near-certainty of climate change’s role in several phenomenon worldwide, from heatwaves to glacial lake floods in Nepal, Rai has a firm message to policymakers: “Do you want science to prove things when they happen, or do you want to act now, so that those climate impacts will be much lower?”