

# We need to think about sustainable cooling

In case you haven't noticed, it's been rather hot. Last Tuesday saw temperatures in the UK push past 40C for the first time ever, and wildfires have been raging across the continent. But, extreme heat has not just been impacting the UK and Europe. The US, the Middle East, North Africa and Asia have also been significantly affected.

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Sounds... worrying – It is a bit. Temperature maps like that displayed above (courtesy of NASA) show the true extent of the heat across the northern hemisphere.

How is such a large area affected? The answer lies in the jet stream in the upper atmosphere, which has snaked into five undulations known as the “wavenumber 5 pattern”. This pattern locked into place and drew up warm air from the Equator in multiple areas. It is thought climate change is making the occurrence of these locked-in jet stream patterns more likely and, when combined with a gradually warming world, multiple heatwaves are becoming more frequent.

# Impacts today

The failure of train services to operate in the UK due to the heat provides a good example of climate change affecting basic infrastructure, which in turn has significant economic consequences.

There are more fundamental risks – such as direct impacts on life and human health. Hot and dry conditions have also already played a significant role in pushing up food prices due to climate-induced multiple crop failures, a process that is being termed “heatflation”.

This could be just the beginning. A 2019 Nature study pointed to the likelihood of concurrent heat extremes, such as those we are currently experiencing, stifling crop yields in the world’s main food production areas simultaneously. These events could have disastrous effects on global food security.

## What should we do?

As well as planning how we can adapt to these increasingly frequent events, we need to think carefully about how we keep ourselves cool in our warming world.

As the International Energy Agency (IEA) highlighted in a major report in 2018, future demand for air conditioning in countries – like the UK – that do not have a large AC stock at present represents a ticking carbon time bomb. Without action, global energy demand from air conditioners is likely to triple by 2050. This would require new electricity capacity equivalent to that currently installed in the EU, the US and Japan combined.

From a climate perspective, going all-out to install conventional air conditioning technologies to deal with heat events would be akin to like hiding behind a heat screen while also pouring petrol on an open fire.

To solve this problem, which if left unmitigated would result in 10 new air conditioning units sold every second for the next 30 years, the IEA says it’s key to develop more efficient AC – which can make a considerable difference to energy use – and set mandatory energy performance standards for AC units. More efficient units would also be more affordable to run.

## Investing in the urban environment

The UK’s Climate Change Committee has highlighted numerous other solutions including passive building design and smarter city design in a recent

report addressing overheating in the UK's building stock. Looking to how humans adapted to hot environments in the past can also yield solutions. For example, passive cooling urban infrastructure such as wind towers have been replicated in more recent city designs.

We shouldn't forget insulation which, as well as keeping houses warm in the winter, can play a role keeping the heat out of buildings in the summer – so long as its designed correctly. Combined with heat pumps, which are inherently energy efficient and can work in reverse to provide cooling in the summer, such investment in building stock will – as we've previously argued – make a great deal of sense from both a thermal comfort and energy security perspective.

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