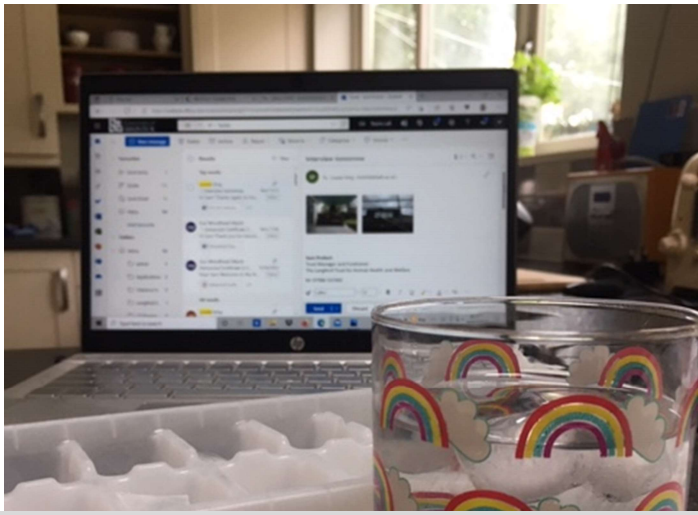




EXPERIENCES OF HEAT IN THE UK: SHIFTING CULTURES

DR LOUISE KING

INSTITUTE FOR SUSTAINABILITY AND CLIMATE CHANGE,
UNIVERSITY OF BATH



Flex-Cool-Store Project

- Flex-Cool-Store investigates the impacts of a growth in UK cooling demand:
  - How this can be managed through **flexible operation**.
  - How the **new demand can be met** in a decarbonised electricity system.

- Key aspects:
  - Definition of prospective cooling demands and cooling infrastructure.
  - **Public perception** and **consumer participation** being explored.
  - Outcomes to be considered alongside **pathways and policies** associated with heat decarbonisation and **'elite' interviews** with policy makers.
  - **Interdisciplinary approach** addressing cooling decarbonisation from multiple angles.

CHANGING CLIMATE AND IMPACTS

Social, economic, and environmental impacts from rising and extreme temperatures within the UK

- Discomfort, mortality and morbidity
- 3,200 to 4500 excess deaths in 2022 heatwaves
- 7,000-10,000 heat-related deaths per year by 2050 without adequate adaptation (EAC, 2024)
- 75% of heat-related deaths - moderate increases in temps 1-5°C (Jenkins et al., 2022)

- Economic and productivity impacts - £60bn/year (EAC 2024)
- Infrastructure failures, including energy systems
- Natural environment stress and damage

Source: FCS, 2024

IMPACTS OF HEAT

Direct impacts

- Dehydration
- Heat stress, heat exhaustion, heat stroke
- Increased risk of death from cardiorespiratory and other diseases
- Mental health issues
- Adverse pregnancy and birth outcomes

Indirect impacts

- Increased risk of accidents
- Increased transmission of diseases
- Sleep disruption
- Growth in violence
- Increased hospital admissions and wider health services impacts

Vulnerabilities

- Adults over 65 years
- People with chronic diseases, long term illness or disabilities
- People with drug and alcohol addictions
- Homeless and living in deprivation
- Very young children

COOLING DEMAND: FOCUS ON HOMES

Peter Muscutt on Unsplash

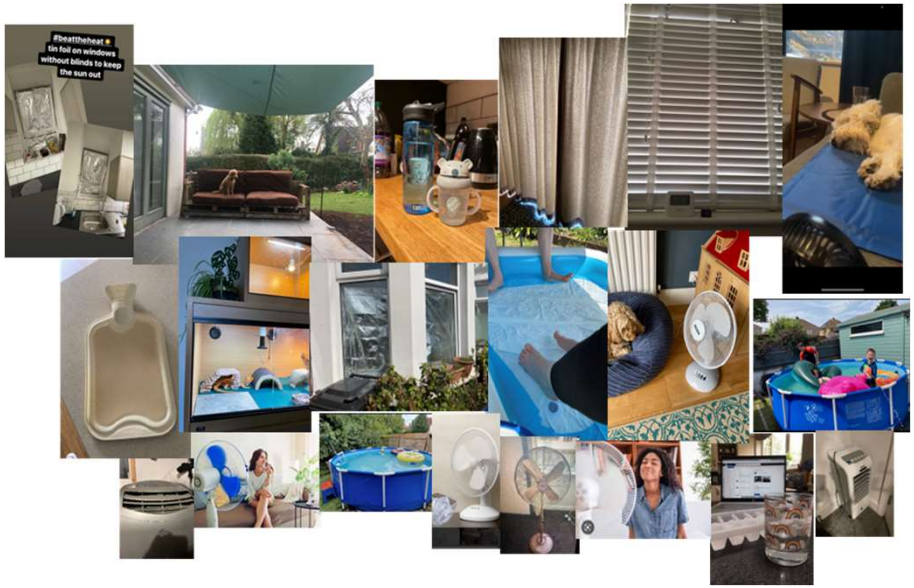
In comparison to other sectors, emissions from cooling in UK homes likely to be small

But…

- Overheating and health risks greater than other sectors
- Current stock largely naturally ventilated and cooled
- Stock designed for temperate climate
- Already seeing overheating in 20% of homes in an average summer
- Could see overheating in 90% of stock with 2°C of warming
- Policy gaps are greater, for heat resilience and cooling challenges

RESEARCH APPROACH - PEOPLE

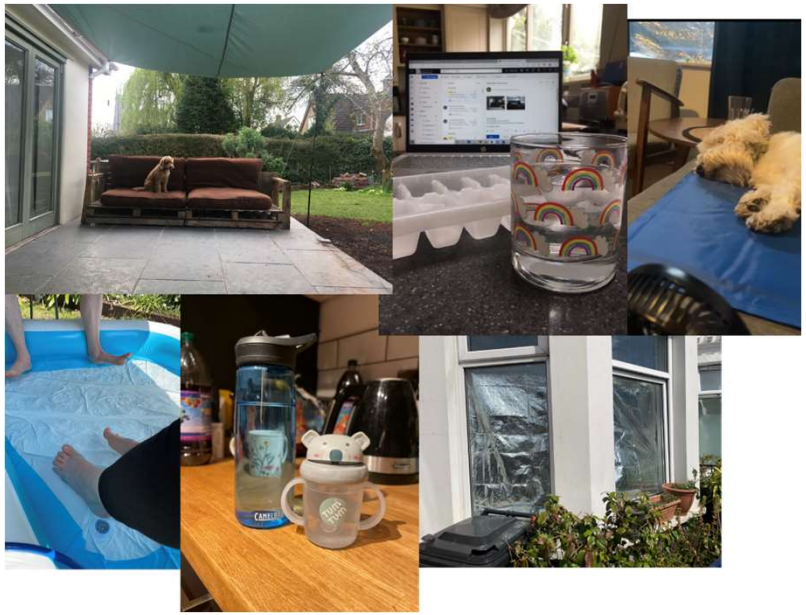
- What are people's lived experiences of extreme heat?
- What coping strategies do people adopt and what are the implications for active cooling demand?
- What are current perceptions of sustainable cooling technology?
- What opportunities are there for adaptation to rising temperatures and mitigation of future active cooling strategies?



UNDERSTANDING COOLING DEMAND

Understand lived experience and context in conditions of extreme heat.

- Participant-led photography – how keeping cool and staying comfortable at home is conceptualised/imagined.
- 40 semi-structured interviews.
- 4 deliberative workshops (n=31)

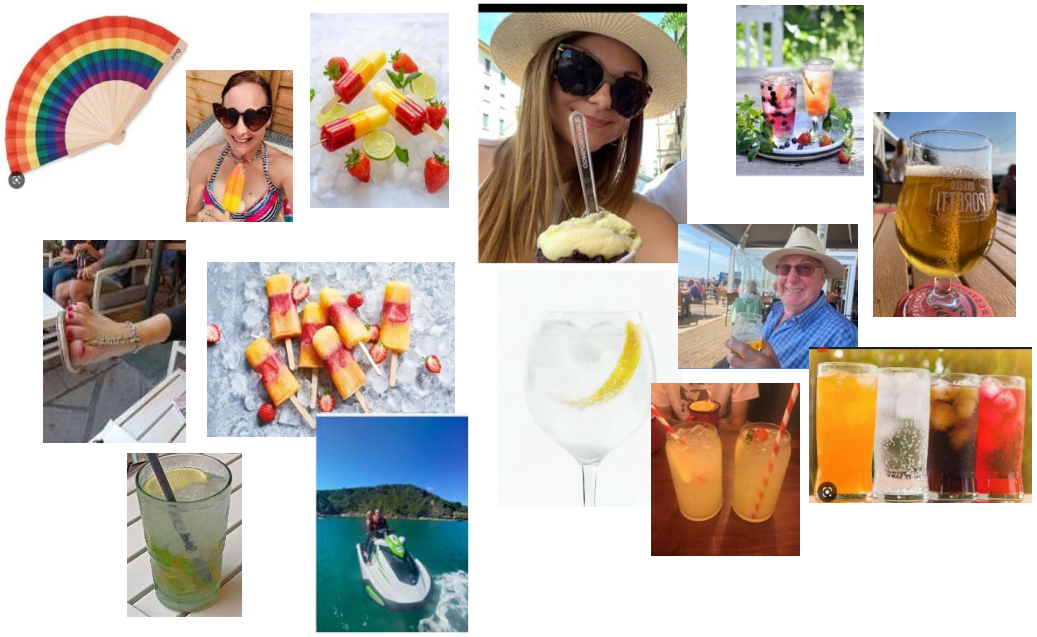


Sample

- Housing archetype (EHS, 2021)
- Urban conurbations South West England
- Broad sample of gender, age, household size, tenure.

Engineering and Physical Sciences Research Council

IMPACTS OF HEAT – ENJOYMENT AND MISERY



Visions of cool

- Images associated with pleasure, relaxation
- Vibrant, saturated palette of colours
- Often taken outside of participants' homes e.g in gardens/terraces/restaurants/pubs
- 'Fun in the sun' water sports for example
- Cultural representations of hot weather

IMPACTS OF HEAT – LIVED EXPERIENCE: ENJOYMENT AND MISERY

- Heat experienced as uncomfortable and inconvenient;
- Heat exacerbates existing health conditions;
- Heat can impact efficacy of medication.

"My sister is diabetic. She's 30. She got **diagnosed with diabetes type one last year** [2021]. She **really, really struggled just being in the heat** for too long…So she fainted on many occasions during the summer. She ended up in hospital." (Jodie, Bath)

IMPACTS OF HEAT – LIVED EXPERIENCE: ENJOYMENT AND MISERY

- Heat is socially isolating;
- Heat exacerbates complex care needs;
- Heat negatively impacts productivity.

"I found the **working from home was probably the hardest** being in meetings and stuff…I found it **hard to concentrate** because all I'm thinking in my head is I just need to cool myself down, I need another drink, I need this meeting to hurry up and be over." (David, Reading)

KEEPING COOL – LIVED EXPERIENCE: RESPONSIBILITY AND CONSUMPTION

Heat can be managed by protecting myself/my family:

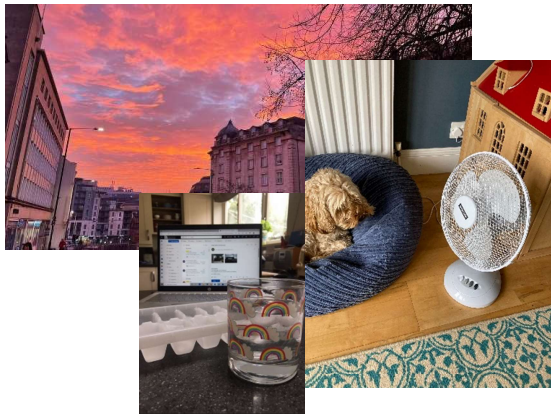
- Common sense strategies to keep cool – shading, ventilation; showering/bathing more often; eating light meals/cool drinks; avoiding alcohol;
- Finding and creating cool refuges;
- Using word of mouth cooling strategies.

KEEPING COOL – LIVED EXPERIENCE: RESPONSIBILITY AND CONSUMPTION

Heat framed as a consumer goods issue:

- Key trusted brands perceived as providing cooling solutions
- Low-cost products are widely available and "*work well enough*" e.g. fans, paddling pools, bedding, clothing;
- Air conditioning provide effective relief from heat.
- An immature market

KEEPING COOL – LIVED EXPERIENCE: RESPONSIBILITY AND CONSUMPTION

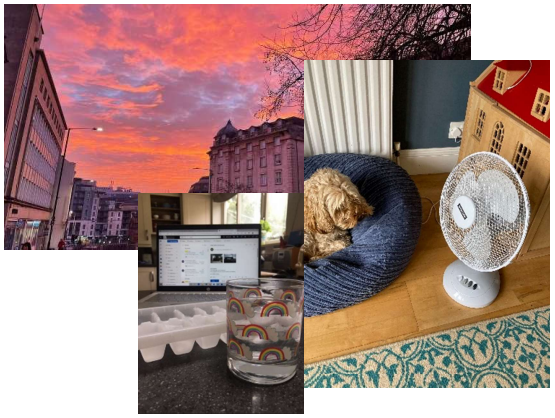


"I would get up earlier, have an earlier breakfast, log on a bit earlier…I would shift my hours around…a longer break at midday, and maybe work a little bit later in the evening."
(Rob, Bristol)

Heat can be managed by adapting my own/family daily routines/habits:

- Changing working hours
- Changing childcare routines
- Altering timing of shopping/exercise/pet care

KEEPING COOL – LIVED EXPERIENCE: RESPONSIBILITY AND CONSUMPTION

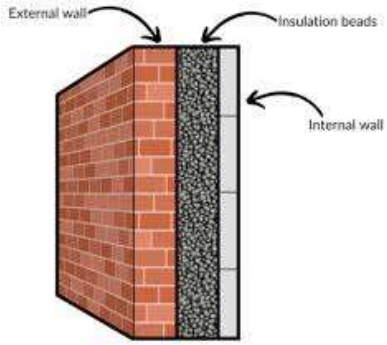


"I'm half Italian, half Jamaican. I went back to Italy's as a kid every summer, we would always have watermelon. And it was refreshing, that's how we kept cool… now it's hot like that here, I guess it's how I remember keeping cool and it's what I do now." (Francesca, Bath)

Heat can be managed by accessing knowledge and drawing on experience:

- watching weather forecasts, engaging with media
- living abroad experience
- childhood, learning from others

KEEPING COOL – LIVED EXPERIENCE: RESPONSIBILITY AND CONSUMPTION



Heat can be managed by adapting my home structurally

"I would want to look at the energy efficiency of my house. I would probably want to invest in solar panels, would help give cheaper electricity and try and store that electricity to give me some sort of air conditioning for during the day or during the nights, especially. The other thing I would look at was better insulation, I would revisit my loft insulation, roof insulation, things like that."

PRECARITY AND INADEQUACY: AN UNEVEN EXPERIENCE

Managing heat depends on personal circumstances

- Size/quality of my home
- Tenure/agency to change
- Household size
- Access to outdoor space/green space

Working practices are unequal:

- Ability to change working hours
- Access to air conditioned workspace
- Employer acknowledgement that heat impacts productivity – *taking heat seriously*

Managing heat depends on economic constraints:

- Cost of passive cooling solutions/adaptations
- Air conditioning is the affordable solution
- Size/quality of home/household

"The actual, the cost and the work of having someone around and putting shutters on every window opposed to just buy an air conditioning, ***it's much quicker and simpler to buy an air conditioning unit than it is to like put shutters on windows****, unless the government are going to help like they've done with the schemes for keeping you know, houses warm."* (Amy, Swindon)

PRECARITY AND INADEQUACY: DIVERSE AND UNSETTLED KNOWLEDGE

"*There was some kind of strange advice, which is, you know, the BBC ran some articles on their website, you know, their news site, which were a bit bonkers. They were telling people to fill up buckets of ice and put a fan over the ice. I mean, it will have a very small effect, and probably create more problems and people running around trying to get buckets of ice, and it doesn't really work. I mean, it will reduce the temperature in a room but only for a very short period of time, then the ice is gone.*

PRECARITY AND INADEQUACY: A NOVEL EXPERIENCE OF HEAT

A new type of heat in the UK:

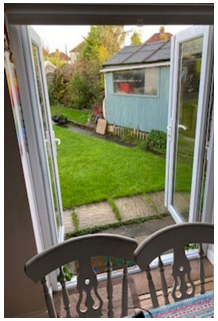
*I will never complain about the cold again. I think that one day where it was like 40° it was absolutely awful…**heat over here compared to the heat abroad is just so different.***
(Matt, Bristol)

"I've never known a time where we've had a continuous week of having to stay indoors, cause of the extreme heat. I don't think I've ever known it to be that hot…" (Barbara, Swindon)

CONNECTION WITH NATURE: LOSSES AND GAINS





"Well, normally you'd want to see the trees and nature and life. But you had to shut that out or it was just unbearable inside. That was a bit sad. It did make me feel a bit claustrophobic.." (Jo, Swindon)

NORMALISING AIR-CONDITIONED FUTURES

"And if we're going to be facing these type of temperatures going forward, or you know, may get even worse, then AC's just going to be one of those necessary things, It might be new to us. But it's not something that we've got no idea how to deal with it. You look at the other hot countries and how they deal with it, and they have air conditioning. So…" (Andrew, Bristol)

"In 20 year's time it's gonna be a different picture…technology will have moved on…Cooling will all be done for us." (Joe, Bath)

"Air con units hang outside the house and they always look ugly…but if that's how we have to live, that's how we have to live…those AC boxes are going to become a thing outside loads of homes now." (Janet, Reading)

NORMALISING AIR-CONDITIONED FUTURES

"And if we're going to be facing these type of temperatures going forward, or you know, may get even worse, then AC's just going to be one of those necessary things, It might be new to us. But it's not something that we've got no idea how to deal with it. You look at the other hot countries and how they deal with it, and they have air conditioning. So…" (Andrew, Bristol)

"In 20 year's time it's gonna be a different picture…technology will have moved on…Cooling will all be done for us." (Joe, Bath)

"Air con units hang outside the house and they always look ugly…but if that's how we have to live, that's how we have to live…those AC boxes are going to become a thing outside loads of homes now." (Janet, Reading)

NORMALISING AIR-CONDITIONED FUTURES

"In 20 year's time it's gonna be a different picture …technology will have moved on…Cooling will all be done for us." (Joe, Bath)

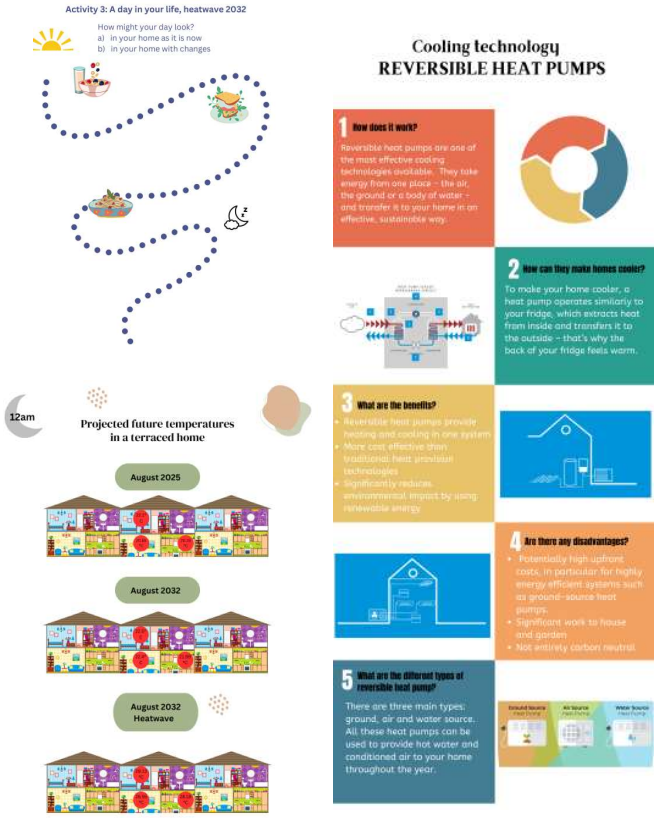
"And if we're going to be facing these type of temperatures going forward, or you know, may get even worse, then AC's just going to be one of those necessary things, It might be new to us. But it's not something that we've got no idea how to deal with it. You look at the other hot countries and how they deal with it, and they have air conditioning. So…" (Andrew, Bristol)

"Air con units hang outside the house and they always look ugly…but if that's how we have to live, that's how we have to live…those AC boxes are going to become a thing outside loads of homes now." (Janet, Reading)

FUTURE DEMAND AND SUSTAINABLE COOLING TECHNOLOGY

- Limited knowledge and familiarity, narratives of inefficiency
- Reliability and efficiency
- Aesthetics, impact on value
- Agency to make decisions - tenure
- Mistrust in government/local authorities
- Negative past experiences

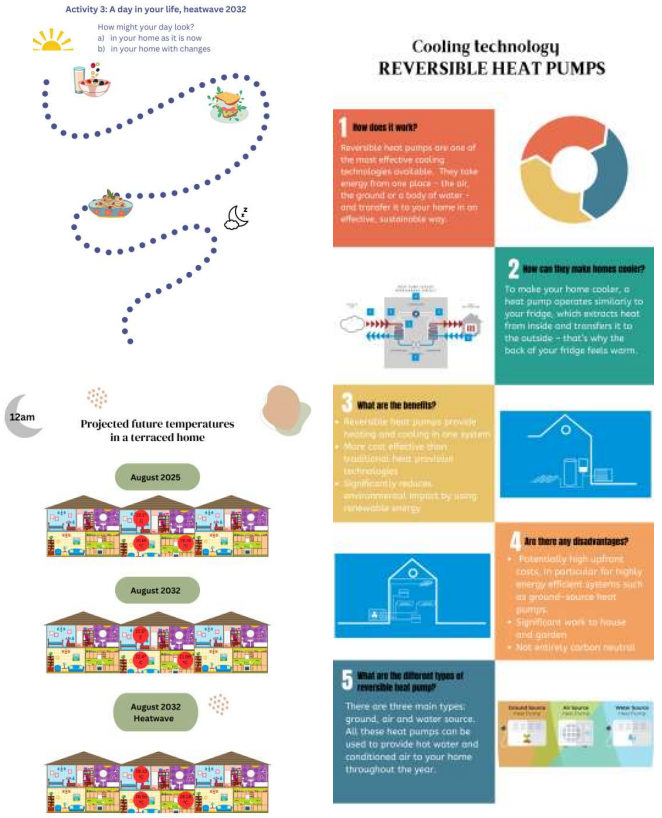
- Support for sustainable solutions (passive, sustainable cooling tech)
- Willingness to engage with technology and integrate heating/cooling solutions
- Desire to better understand solutions and interest in engaging with debates



FUTURE DEMAND AND SUSTAINABLE COOLING TECHNOLOGY

- Limited knowledge and familiarity, narratives of inefficiency
- Reliability and efficiency
- Aesthetics, impact on value
- Agency to make decisions - tenure
- Mistrust in government/local authorities
- Negative past experiences

- Support for sustainable solutions (passive, sustainable cooling tech)
- Willingness to engage with technology and integrate heating/cooling solutions
- Desire to better understand solutions and interest in engaging with debates



EXPERIENTIAL INSIGHTS

- Participants described novel experiences of extreme heat in the UK during the summer of 2022
- Perceptions of extreme heat as inherently enjoyable is diminishing as more sustained heatwaves are experienced.
- Cooling offers a solution to cope with extreme heat in everyday life, with air conditioning the most familiar solution.
- A societal shift from protective to preparative action could be harnessed to support and encourage adaptation and mitigation measures.
- Clear, accessible and practical advice is required, communicating at a local and contextual level is critical.
- A participatory approach to cooling solutions, working with household/communities has the potential to support engagement with sustainable cooling solutions.

RECOMMENDATIONS – THE FUTURE OF COOLING

1. Act quickly and comprehensively. There is a clear rationale for action and currently a window of opportunity, harnessing lived experiences of heat and societal shifts.

2. Seek synergies. To help overcome some of the challenges for policy making related to heat resilience and cooling.

3. Support people. To take low-carbon and climate-resilient behaviours and protect the vulnerable. Utilise clear and accessible communication strategies.

4. Build on best practice. Within the UK and internationally to identify effective solutions and to help save time and resources.

5. Lead nationally and support action locally. To create an integrated, joined-up, policy approach, that creates resilient homes and localities that are fit for the future, that keep people warm in winter and cool in summer, supporting health, affordability, and equity.

REFERENCES

- ARUP. Addressing overheating risk in existing UK homes. https://www.theccc.org.uk/wp-content/uploads/2022/10/Addressing-overheating-risk-in-existing-UK-homes-Arup.pdf (2022).
- BEIS. Cooling in the UK. https://www.gov.uk/government/publications/cooling-in-the-uk (2021).
- EAC. Heat resilience and sustainable cooling. UK Parliament Committee. Environmental Audit Committee Inquiry. Heat Resilence and Sustainable Cooling https://committees.parliament.uk/work/7811/heat-resilience-and-sustainable-cooling/ (2024).
- Jenkins, K., Kennedy-Asser, A., Andrews, O. & Lo, Y. T. E. Updated projections of UK heat-related mortality using policy-relevant global warming levels and socio-economic scenarios. Environmental Research Letters 17, 114036 (2022).
- Howarth, C. et al. Turning up the heat: Learning from the summer 2022 heatwaves in England to inform UK policy on extreme heat. (2024).
- Khosravi, F., Lowes, R. & Ugalde-Loo, C. E. Cooling is hotting up in the UK. Energy Policy 174, 113456 (2023).
- Miranda, N. D. et al. Change in cooling degree days with global mean temperature rise increasing from 1.5 °C to 2.0 °C. Nature Sustainability 6, 1326–1330 (2023).
- Mitev, K., Player, L., Verfuerth, C., Westlake, S. & Whitmarsh, L. The Implications of Behavioural Science for Effective Climate Policy. (2023).
- NAO. Government resilience: extreme weather. HC 314. https://www.nao.org.uk/wp-content/uploads/2023/12/government-resilience-extreme-weather.pdf (2023).
- UNEP. Global Cooling Watch 2023: Keeping it Chill: How to meet cooling demands while cutting emissions. https://wedocs.unep.org/bitstream/handle/20.500.11822/44243/keeping_cool_hot_world.pdf?sequence=1&isAllowed=y (2023).

Thank you!