CIBSE response to National Heat Risk Commission

Submitted by: Sam Baptist, Director of Policy & External Affairs
Organisation: Chartered Institution of Building Services Engineers (CIBSE)
Contact: SBaptist@cibse.org

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About CIBSE

The Chartered Institution of Building Services Engineers (CIBSE) is the professional body for building services engineers, with around 24,000 members worldwide. Our members design, install, commission and operate the heating, cooling, ventilation and energy systems that determine whether a building stays safe and comfortable in extreme weather.

CIBSE sets many of the technical standards the UK industry uses to assess and limit overheating. These include Guide A (Environmental design), TM52 for non-domestic buildings, TM59 for homes and CIBSE Weather Data, used for building design. They underpin Approved Document O of the Building Regulations in England, the Department for Education's Building Bulletin 101 for schools, as well as other regulatory guidance that concern building services engineering across the built environment. We also have members and regional groups in hot climates such as the Middle East, Hong Kong / China and Australia, which gives us practical experience of designing for heat beyond UK norms.

We are submitting evidence because extreme heat is, to a large extent, a building performance problem. Homes, schools, hospitals, care homes and workplaces are where most people experience heat risk, and how those buildings are designed, retrofitted and operated is determined by our members and by the regulation and standards they work to.

Executive summary

Extreme heat is, to a large extent, a building performance problem. Much of the UK stock was designed to retain heat in winter, and many recent homes are highly insulated with limited means of shedding heat. Around one in five homes already overheats in summer, and around 90% could do so under 2°C of global warming (CCC, 2022). Heat-associated deaths occur in people's own homes and in care homes, and are concentrated among older and other vulnerable people.

Those most at risk have the least control over their buildings. Older people, people with chronic illness or disability, care home residents, and occupants of top-floor, single-aspect and heavily glazed homes, as well as homes in urban 'heat islands' are most at risk of the effects from extreme heat. Responses can also widen inequality: retrofit without overheating assessment can raise summer temperatures, and reliance on mechanical cooling shifts costs to those least able to pay.

The tools have been updated, but regulation lags. CIBSE's 2025 Weather Data adds UKCP18-based projections for the 2030s, 2050s and 2080s. Our recently updated overheating calculation methodology for dwellings now ensures homes are assessed against 2050s weather. Yet regulatory compliance does not yet take account of these changes, nor do

building regulations require an overheating assessment for major changes to existing homes or other building types. The Chancellor's recent announcement that Building Regulations will not be changed until 2029 must not prevent necessary amendments to mitigate overheating risk in buildings.

Closing the gap. We ask the Commission to consider:

- Changes to building design guidance to require overheating assessments in new homes using the latest industry weather data and calculation methodology.
- Require future-climate assessment for long-life and critical buildings, using weather data that reflects the future climate.
- Extending overheating requirements to major refurbishment and retrofit, with a practical method for existing buildings.
- A thermal safety standard for hospitals, care homes, schools and prisons, with indoor temperature monitoring and mitigation plans.
- Maintaining a passive-first cooling hierarchy, supported by efficient low-carbon cooling, and avoiding maladaptation.
- Minimum competence expectations on overheating and climate resilience for designers, modellers and retrofit professionals.
- A new national heat resilience strategy with clear government ownership that covers buildings.

By 2036, every new building designed for future climate and verified, critical public buildings assessed and monitored, overheating routinely considered in retrofit, and better data on real indoor conditions. The existing stock cannot be retrofitted in a decade, so the priority should be the most vulnerable people and buildings.

CIBSE would welcome the opportunity to work with the Commission as its programme develops.

Evidence

1. How is extreme heat, and its companion hazards of drought or wildfire, affecting your organisation, sector and the people you work with or serve?

For our sector, the central impact is that buildings are being asked to perform in conditions they were not designed for. Much of the existing stock, and some recently built stock, was designed against historical weather data with the aim of retaining heat in the winter months, while many recent homes are highly insulated and have poor ventilation design with limited means of shedding heat.

Periods of extreme heat therefore directly affect the health, comfort and productivity of all occupants in buildings and homes, particularly the vulnerable. Around one in five UK homes already overheat in summer, and 90% could overheat under 2°C increase in global temperatures (CCC, 2022). Significant heat-associated mortality occurs in people's own homes and in care homes; UKHSA reported over 2,800 heat-related deaths in England this year during the May and June heatwaves.

For building designers and engineers, heat resilience must therefore be addressed at the early design stage and through operation, not treated as a compliance exercise. Companion hazards

matter too: wildfire smoke affects indoor air quality and ventilation strategy, and drought affects water use for evaporative cooling.

2. Are some people or communities more affected by extreme heat, drought or wildfire than others?

Yes. Heat-associated mortality is concentrated among older people. UKHSA data shows that the highest rates of heat-associated deaths were among those aged 85 and over, followed by those aged 75–84. Care home residents are particularly exposed, as are people with chronic illness, disability or limited mobility (ONS/UKHSA, 2022-26).

From a building perspective, vulnerability is shaped less by the weather than by the building a person lives or works in and how much control they have over it. Those in top-floor and single-aspect flats, heavily glazed dwellings, and homes in urban heat islands are most affected. Where noise, security or air quality prevent windows from being opened, passive cooling is lost, which disproportionately affects households and buildings in dense urban areas. Renters usually cannot install shading or other adaptations, and schools, hospitals and workplaces often give occupants little control over conditions.

Responses can also widen inequality. Energy-efficiency retrofit of buildings and homes without overheating assessment can raise summer indoor temperatures, and reliance on mechanical cooling shifts costs to those least able to pay.

3. What is your organisation doing to understand, prepare for and respond to extreme heat, and/or its companion hazards of drought or wildfire?

CIBSE sets many of the technical standards the UK industry uses to assess and limit overheating. In July 2025, it published a new Weather Data set, developed with the University of Exeter. It updates the observational baseline to 1994–2023, uses the Met Office's UKCP18 projections for the 2030s, 2050s and 2080s, and expands coverage from 16 locations to 28 climate zones (CIBSE, 2025).

In July 2026, CIBSE published TM59:2026, which requires homes to be assessed against 2050s weather, introduces a new bedroom criterion informed by sleep research, and recognises ceiling fans as a low-energy comfort measure (CIBSE, 2026). CIBSE also maintains Guide A and TM52, engages with government and regulators on Building Regulations, and supports professional upskilling through training and continuing professional development (CPD).

4. What has worked well, and what have you learnt?

Requiring overheating assessment for new homes through Part O, with a common methodology (TM59), has made overheating a standard design consideration and given the industry a consistent basis for demonstrating compliance. A cooling hierarchy that puts passive measures first has protected both energy use and running costs, and established industry weather data has let designers, clients and regulators work from the same assumptions

In terms of what we have learnt:

- Design-stage compliance does not guarantee delivered performance. Differences between the modelled and the built home, and in commissioning and operation, can undo good design, and without in-use data we cannot see how large the gap is.

- Strategies that rely on occupants opening windows often fail in practice because of noise, security and air quality, so passive cooling is lost where it is most needed.
- Retrofit focused on energy and carbon, without an overheating assessment, risks creating new problems in the homes it is meant to improve.

5. What tools, information, evidence or guidance do you use, and what is missing or needs to improve?

Building designers use the CIBSE weather data to test how heat risk changes across time periods, emission scenarios and probability percentiles. The Design Summer Years (DSY) represent different types of hot summer: a moderately warm summer (DSY1), a summer with a short, intense warm spell (DSY2) and a summer with a longer, less intense warm spell (DSY3). CIBSE TM59:2026 sets the dynamic modelling methodology for dwellings, and TM52 covers non-domestic buildings.

What is missing:

- Systematic post-occupancy data on indoor temperatures to validate design-stage predictions.
- Proportionate assessment tools for routine retrofit, where full dynamic modelling is challenging or impractical.
- Safe indoor temperature thresholds particularly for vulnerable occupants, aligned with health evidence.

6. What barriers are preventing your organisation or sector from taking further action or delivering planned measures?

Compliance with Building Regulations still relies on 2016 weather files. CIBSE's 2025 data and TM59:2026 reflect current climate science and a 2050s horizon. Designing only to the compliance files risks homes that overheat well within their design life. The government has committed to a technical review of Approved Document O, including adoption of the updated TM59 (MHCLG, 2026), but no timetable has been published.

The 2026 Budget announcement (28 October 2026) confirmed that no major changes would be made to Building Regulations until the end of the current Parliament (2029), unless for building safety purposes. It is essential that heat-related mitigations to Building Regulations and supporting guidance continue to be made in a timely manner as industry evidence evolves – failure to do so is a life safety risk, not just a building safety one.

Other barriers are that Building Regulations cover only new residential buildings, leaving existing homes outside its scope; competence in overheating assessments and modelling varies; and constraints from noise, security and air quality limit passive ventilation on dense urban sites. Passive measures also add upfront cost while the benefits fall to occupants or the health system, and responsibility for heat resilience in buildings is split across housing, health, education and workplace policy.

7. What do you need from other organisations or institutions to become more resilient to extreme heat?

- **UK Government (MHCLG):** complete the Approved Document O review to a published timetable, adopting TM59:2026 and the 2025 CIBSE weather data. Devolved Authorities should align their equivalent standards.
- **Government and funders:** require overheating risk assessment in publicly funded retrofit programmes, and fund passive measures such as external shading alongside energy-efficiency works.
- **Building Safety Regulator and building control bodies:** ensure overheating assessments are reviewed competently at approval.
- **Met Office and UKHSA:** keep investing in UK climate projections and in data linking indoor temperatures to health outcomes.
- **Local planning authorities:** address overheating at layout stage, including orientation, single-aspect units and urban greening.
- **Health, education and care regulators and estate owners:** clear thermal safety expectations for hospitals, care homes and schools, with funding to meet them.

8. What wider changes would help your sector, communities and the UK become more resilient to increasing heat?

We support the Commission's recommendations on standards, evidence, cooling public services and protecting vulnerable. In addition, we suggest the Commission considers:

- **Extending overheating requirements** to major renovations and to non-residential buildings with vulnerable occupants, such as schools and healthcare settings.
- **Thermal safety expectations for critical public buildings** (hospitals, care homes, schools, prisons): assessment against future climate, defined safe temperature limits, and tested mitigation plans for extreme heat.
- **A cooling hierarchy** that prioritises passive measures (orientation, aspect ratio, glazing ratio, shading, ventilation, air movement) before mechanical cooling, to protect net zero and running costs. Where mechanical cooling is necessary, low-energy and low-carbon technologies should be prioritised.
- **In-use monitoring** of indoor temperatures in a sample of new and retrofitted homes to close the performance gap, and in vulnerable settings such as care homes.
- **Testing across a range of future weather scenarios** for long-life and critical buildings, with delivered performance verified through commissioning.
- **Competence expectations** on overheating and climate resilience for those designing and retrofitting buildings.

We would also support **a new national heat resilience strategy**, with a dedicated section on the built environment. This would support clearer government ownership and delivery across heat resilience and mitigation.

9. In ten years' time, what would 'good' heat resilience look like?

By 2036, every new home and major refurbishment would be designed, and verified, to stay safe and comfortable in the 2050s climate, mainly through passive measures. Designers would routinely test performance across a range of future weather scenarios rather than a single compliance file. Existing homes at highest risk, particularly those of older and vulnerable

occupants, would be identified and retrofitted, and measured indoor temperatures, not only modelled ones, would inform policy.

In non-domestic settings, hospitals, care homes and schools would have assessed their heat risk and have a tested plan for extreme heat. The existing stock cannot realistically be retrofitted within ten years, so the priority should be the most vulnerable people and buildings. A realistic near-term milestone is aligning Building Regulations with the latest weather data and overheating calculation methodology.

10. Is there anything else the Commission should understand or investigate?

- **Net zero and adaptation need to be designed together.** Retrofit and heat pump roll-out can improve heat resilience, but only if overheating, cooling capability and peak electricity demand are considered from the start, and high global warming potential refrigerants are avoided.
- **Resilience of plant and power** in critical buildings, since heat is a common cause of cooling, power and IT failures.

CIBSE would welcome the opportunity to work with the Commission as its programme develops. It is happy to provide technical expertise and guidance on building overheating, climate data and building services design, and to facilitate engagement with its members and wider industry networks.

References

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