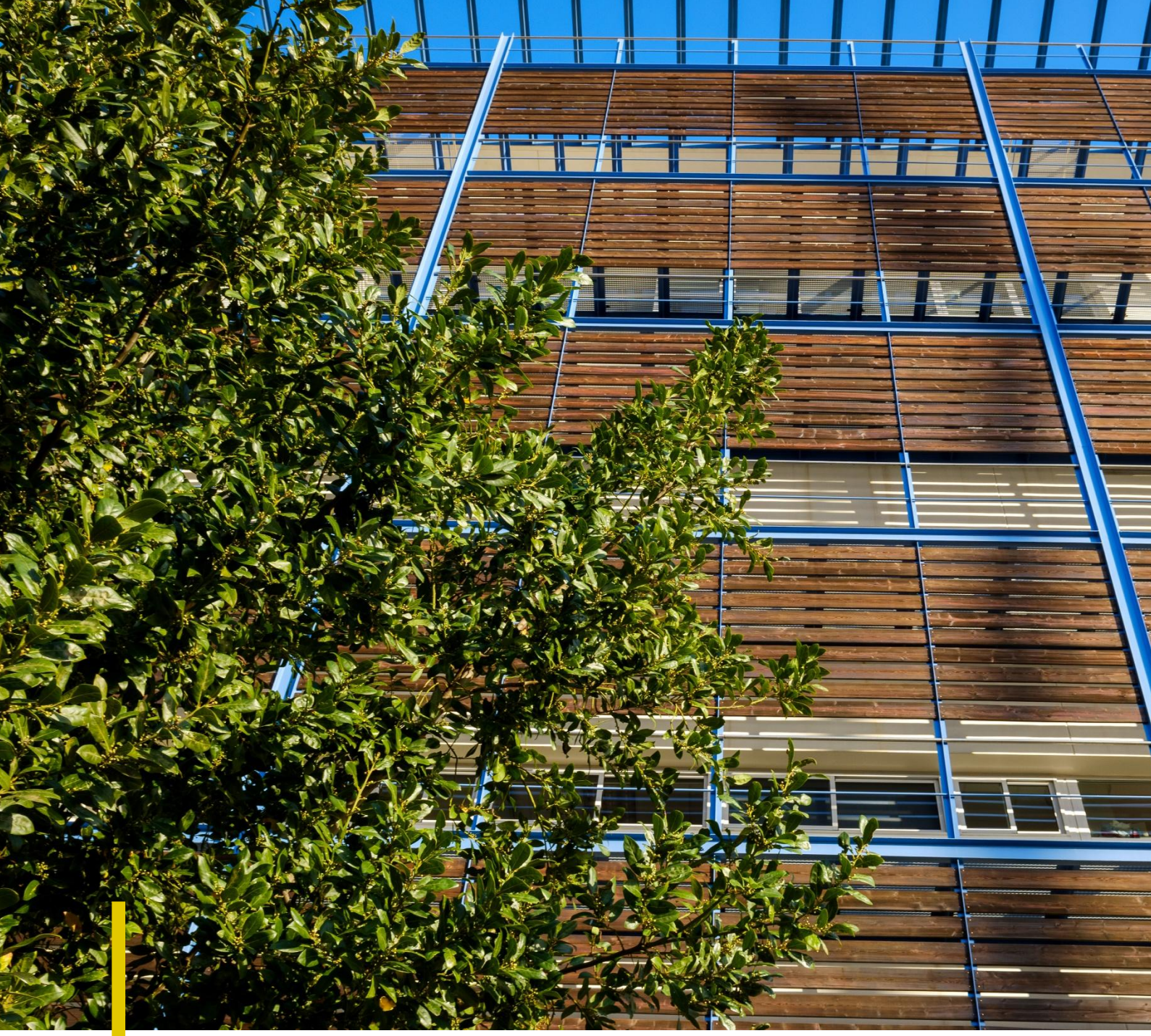

# Planning to reduce overheating

## Topic resource

## Planning for the Climate Crisis: A guide for local authorities

RTPI Royal Town Planning Institute

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**Publication Date:** December 2025

# Introduction

**Heatwaves are now the deadliest climate change related disasters regularly occurring in Europe. The record breaking heat of summer 2022 led to five separate heatwave events and saw temperatures reach 40ºC in the UK for the first time. This extreme weather was associated with nearly 3,000 excess deaths in the UK,[1] and has been attributed to 61,000 premature deaths across Europe.[2]**

The risk to health arises because prolonged exposure to heat raises the blood pressure and heart rate, and affects the circulatory, nervous and respiratory systems. This means that some people are more vulnerable to illness during hot weather, including older people and those with pre-existing health conditions. Heatwaves can also exacerbate mental health conditions and place a general strain on the population as work, sleep and daily life become more difficult.[3]

Heatwaves can be particularly severe in urban areas, due to the urban heat island effect. This describes how the prevalence of hard surfaces such as concrete, tarmac and roofs in towns and cities absorb the sun's energy and radiate it as heat. Often, poorer neighbourhoods are more affected as residents have less access to cooler green spaces and are more likely to be living in over-crowded homes.

The design of buildings in the UK has not kept pace with the increased risk of overheating due to climate change. The latest English Housing Survey found that those in newer homes were more likely to report overheating than residents of older homes, and that 250,000 householders in homes built since 2012 reported that their homes got uncomfortably hot.[4] In a changing climate, the careful design and planning of places and buildings to reduce the public health risk of overheating is imperative.

This topic resource outlines the principles and approaches that local authorities can take to ensure that planning supports adaptation to overheating. This guide should be read in conjunction with the topic resource on Planning for long term adaptation.

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# Policy Context

**The National Planning Policy Framework states that the planning system should 'take full account of all climate impacts' and lists overheating as one of the issues that should addressed to 'minimise vulnerability and improve resilience'.**[5] This includes consideration of the 'long term implications'[6] of climate risks, which means planners must have awareness of how the increased risk of overheating is likely to impact their area over the coming decades and beyond. Local authorities should consider climate risk for the lifespan of development – meaning 100 years for residential development, and even longer for major infrastructure.

For new residential buildings, Part O of the Building Regulations apply. These ensure buildings make reasonable provisions to limit unwanted solar gains in summer and provide a means to remove heat from the indoor environment.[7] Planning authorities are not required to duplicate the requirements set out in Part O of building regulations but should consider design approaches to reduce the risk of overheating in policies.

The National Model Design Code[8] includes considerations for reducing overheating risk including orientation, glazing and aspect. These can be incorporated into design policies and local design guides and codes.

# Key principles

There are many opportunities for planning to secure interventions that help reduce the impact of overheating. The following principles should guide the approach taken by local authorities:

- Consider how overheating can be mitigated at the building, site, and place scale.
- Ensure new buildings are designed to maintain comfortable temperatures even in extreme heat.
- Make street tree planting and green infrastructure a requirement for all development to reduce the urban heat island effect.
- Focus on those communities most at risk and seek design solutions that do not impose additional energy costs for those on low incomes.

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# Evidence for mitigating overheating

**Understanding of the risks posed to communities by rising temperatures should form a vital part of the development plan evidence base.** There is a large amount of evidence on the negative impacts of heat stress on public health, the health inequality issues that arise, and the design benefits of, for example, green infrastructure. Local authorities should draw on national datasets such as the Climate Change Risk Assessment and the Met Office UK Climate Projections. The Centre for Climate and Health Security, part of the UK Health Security Agency, provide evidence and guidance on climate related risks to health.

However, the urban heat island effect can have highly localised consequences, and so local analysis is also important to understand. Some local authorities have created local vulnerability mapping to understand these.

Where this detailed evidence is not available, authorities should incorporate the 'no-regret' urban design measures, highlighted in 'good practice for plan making' section below, in development plan policies. The principal that green infrastructure reduces urban heating is well established,[9] and local authorities can draw on existing resources such as the Natural England Green Infrastructure Framework to understand where interventions may be most effective in their authority areas.

Links to sources mentioned here are provided in the further resources section.

Figure 1: Green spaces provide essential shade during hot weather. Source: Summertimeblues / Shutterstock.com

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## Box 1: Case study - Keep Bristol Cool mapping tool

A map of Bristol has been created to depict the urban heat risks in the city. The Bristol Heat Vulnerability Index shows how risks of urban heating are varied across the city and shows where communities are more vulnerable. The map also shows how climate change may change trends in coming decades.

This allows users to explore different heat related risks using the visual data displayed on the map to quantify climate risks. This tool enables decision makers to plan and direct resilience measures for future climate related risks such as heatwaves by analysing their potential geo-spatial impact.

**Link:** Mapping tool
**Authors:** The mapping tool is a collaboration between Bristol City Council, the UK Climate Resilience Programme, the Tyndall Centre and Met Office Urban Climate Service team.
**Date:** August 2022

# Good practice for plan making

**As outlined above, overheating is an issue that should be addressed at different scales, from individual buildings, regeneration of existing towns and cities, to the creation of new communities.**

Plan makers should therefore develop policies that support adaptation and resilience to increased heat at all these scales. Development plan documents should seek to:

- Set requirements for climate vulnerability assessments for new development, which incorporate overheating risk.
- Require development to include a cooling strategy for new buildings, infrastructure and the design of places, in line with the cooling hierarchy (see Figure 2).
- Encourage developers to utilise existing, recognised guidance and methodologies to develop strategies for overheating in buildings. For example:
    - 
    - 

  - The Chartered Institution of Building Services Engineers (CIBSE) assessment of overheating risk in homes is a recognised tool for assessing risk and identifying mitigations.[10]
  - The Good Homes Alliance has developed non-technical guidance for assessing and mitigating overheating in new homes.[11]
- Provide detailed guidance on design approaches to tackle overheating. These should outline the multiple factors that can increase heat, including layout, orientation, and materials; and promote design interventions to support thermal comfort such as shading strategies, ventilation and green infrastructure. These might include design approaches that are visually different from traditional architecture, so policies should enable innovation in design.[12]
- Plan green infrastructure as part of wider infrastructure networks in order to deliver urban cooling and local access to shady outdoor space, as well as its many other benefits. This includes protection and enhanced access to blue infrastructure such as rivers, streams and canals which also lower air temperatures. Natural England's Green Infrastructure Standards can be supported by planning policy.[13]
- Make sure that noise and air pollution can be managed, as high levels of pollution are a deterrent to opening windows and using passive ventilation.[14]
- Ensure that reducing the risk of overheating informs strategies and policies to support retrofit, alongside measures to increase energy efficiency of homes. Effective ventilation must go hand in hand with improved insulation, for example, to reduce the risk of damp in winter and overheating in summer.
- Promote passive ventilation strategies to deter the use of cooling systems such as air conditioning that further contribute to greenhouse gas emissions (through use of energy and refrigerants), and risk creating noise pollution.
- Protect and expand accessible green spaces, particularly in areas where there is limited provision.

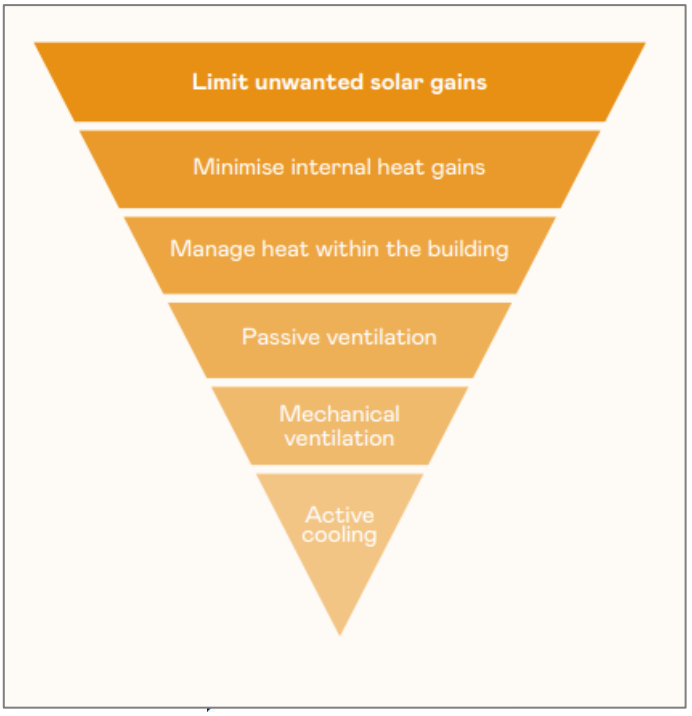


Figure 2: Cooling hierarchy for overheating mitigation (adapted by Good Homes Alliance from the GLA London Plan). Image source: Good Homes Alliance, Shading for Housing.

## Box 2: Case study - Old Oak and Park Royal Overheating SPD

To address the growing risk of overheating in high-density development, Old Oak and Park Royal Development Corporation developed a Supplementary Planning Document (SPD) to address energy performance, daylight and overheating. It sets out clear principles and ambitions for mitigating heat risk in both residential and non-residential buildings.

The SPD requires compliance with CIBSE overheating assessment TM59 for residential and TM52 for non-residential schemes, using 2020 Design Summer Year (DSY) as a baseline and encouraging futureproofing through 2050 climate scenarios. Applicants must demonstrate how the Greater London Authority's cooling hierarchy has been followed and provide modelling to show overheating risk has been assessed and mitigated.

This SPD includes a checklist of quantifiable and tangible considerations that applicants are required to address as part of their planning application on overheating, and asks developers to consider the following queries:

- Has the application of natural ventilation for residential and commercial spaces been reviewed?
- If so, has natural ventilation been applied? (Space types or unit types)
- Does the building layout avoid single-aspect dwellings and maximise cross-ventilation?
- Has dynamic overheating modelling been undertaken using 2020 London Heathrow weather files?
- Has further overheating analysis been undertaken using 2050 London Heathrow weather files?
- Do the commercial units show an overheating risk in line with CIBSE TM52 or CIBSE Guide A for conditioned spaces?

**Link:** Passive Energy Performance, Daylight and Overheating in High-Density Development SPD
**Authors:** Old Oak and Park Royal Development Corporation
**Date:** June 2022

# Decision making

**To ensure that development contributes to mitigating the risks arising from extreme heat, local planning authorities are recommended to apply the following considerations through the development management process:**

- Prioritise the use of nature-based solutions and green infrastructure to reduce the urban heat island effect on development sites.
- Check that strategies for reducing overheating have been applied to the design of new buildings through consideration of orientation, shading, internal layout, solar reflection, fenestration, insulation, ventilation and use of features such as green roofs and walls.
- Where policies set requirements for overheating, such as cooling hierarchies or compliance with assessment frameworks, ensure that applicants provide evidence on how this has been applied.
- Encourage developers to make use of assessment frameworks to ensure that criteria are met.

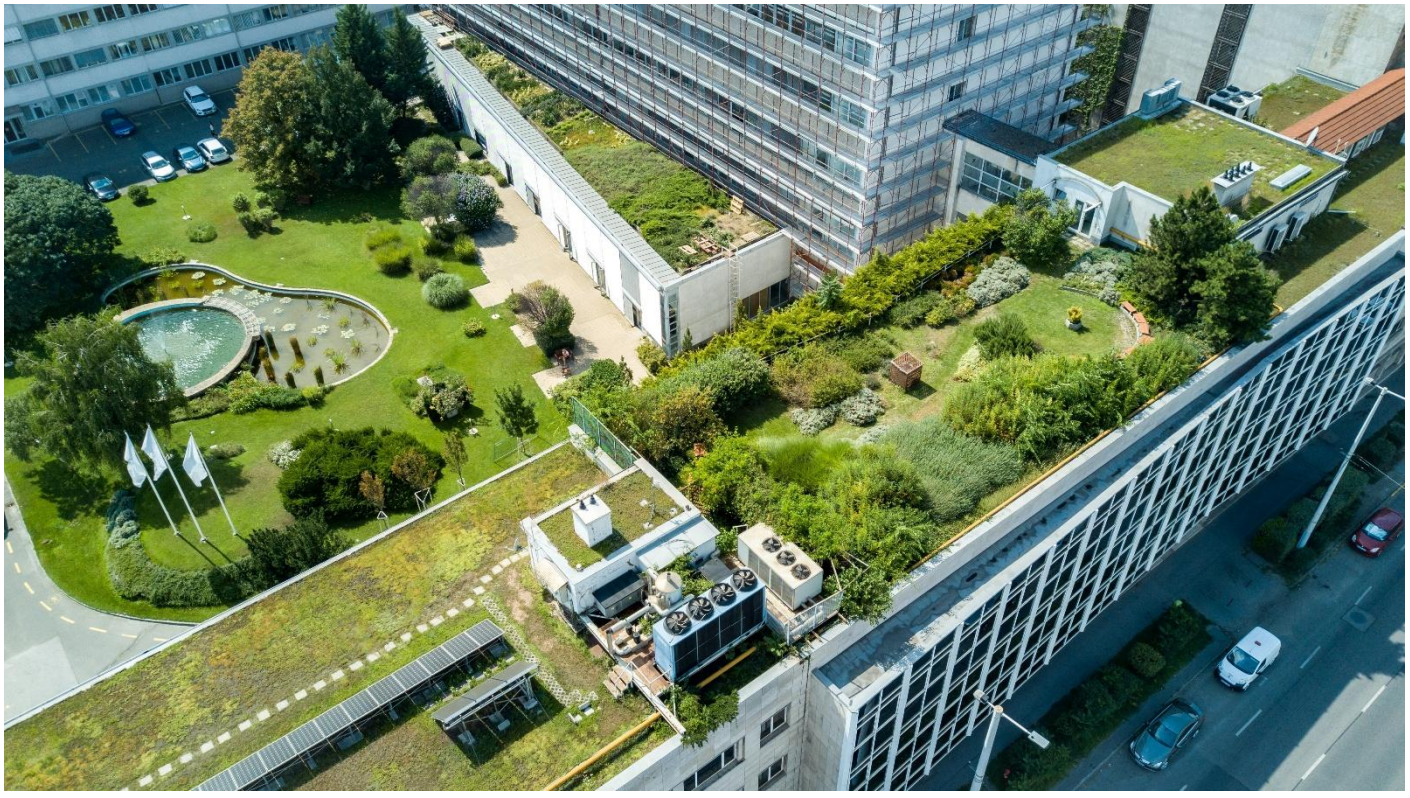

Figure 3: Green roofs can help reduce the urban heat island effect. Source: Videoanita / Shutterstock.com

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# Further Resources

### CIBSE - TM52 The limits of thermal comfort: avoiding overheating

The TM52 is the industry standard for assessing overheating in non-domestic buildings. It provides a robust, simulation-based methodology.
https://www.cibse.org/knowledge-research/knowledge-portal/tm52-the-limits-of-thermal-comfort-avoiding-overheating-in-european-buildings

### CIBSE - TM59 Design methodology for the assessment of overheating risk in homes

The TM59 is the industry standard for assessing overheating in residential buildings. It uses a simulation-based approach with specific criteria for living spaces and bedrooms, using DSY weather files. https://www.cibse.org/knowledge-research/knowledge-portal/technical-memorandum-59-design-methodology-for-the-assessment-of-overheating-risk-in-homes

### DEFRA - UK Climate change risk assessment 2022 (CCRA3)

The third national climate change risk assessment, published in 2022, as required from government by the Climate Change Act.
https://www.gov.uk/government/publications/uk-climate-change-risk-assessment-2022

### Good Homes Alliance – Overheating Toolkit and design guide

The Toolkit offers practical guidance for assessing and mitigating overheating risk in new and existing homes, tailored for planners, designers, and housing providers.
https://goodhomes.org.uk/overheating-in-new-homes

https://goodhomes.org.uk/news/shading-for-housing

### Met office – UK Climate Projections (UKCP18)

The national climate model projections for the UK.
https://www.metoffice.gov.uk/research/approach/collaboration/ukcp

### Shade the UK – Overheating Adaptation Guide for Homes

A tool for residents to understand how to reduce the influence of overheating in existing homes. Although aimed at retrofitting existing homes, much of the guidance applies to the planning and design of new buildings.
https://www.shadetheuk.com/overheating-adaptation-guide-for-homes

### UK Health Security Agency Centre for Climate and Health Security

Latest publications and guidance on the health risks of climate change from the UKHSA.
https://www.gov.uk/government/organisations/the-centre-for-climate-health-security



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[4] *English Housing Survey 2023 to 2024: climate resilient homes factsheet.* MHCLG, July 2025. https://www.gov.uk/government/statistics/english-housing-survey-2023-to-2024-climate-resilient-homes-fact-sheet

[5] *National Planning Policy Framework.* MHCLG, December 2025. https://www.gov.uk/government/publications/national-planning-policy-framework--2 (Paragraph 161).

[6] Ibid. (Paragraph 162).

[7] *Overheating: Approved Document O.* HM Government, December 2021. https://www.gov.uk/government/publications/overheating-approved-document-o

[8] *National Model Design Code Part 2: Guidance notes.* MHCLG, Jan. 2021. https://www.gov.uk/government/publications/national-model-design-code

[9] For example, see the Evidence Note produced by Forest Research on Green Infrastructure and the urban heat island: https://cdn.forestresearch.gov.uk/2022/02/urgp_evidence_note_004_heat_amelioration.pdf

[10] *Design Methodology for the Assessment of Overheating Risk in Homes. TM59.* CIBSE, May 2017. https://www.cibse.org/knowledge/knowledge-items/detail?id=a0q0O00000DVrTdQAL

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**Cover image:** External shading on a new residential building. Source: Sockagphoto / Shutterstock.com
**Icons:** Flaticon.com by iconixar

**Planning to reduce overheating**
**Topic Resource 18**
**Planning for the Climate Crisis: A Guide for Local Authorities**

Fifth Edition

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