

Cooling Roadmap for London

Full Report

August 2026

Delivered by Love Design Studio and Shade the UK; commissioned by C40 Cities; supported by the Greater London Authority; and funding support provided by Carrier.
Analysis and conclusions are those of the authors.

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1. About

Project Delivery Team

Love Design Studio



Love Design Studio are a team of built environment and sustainability specialists, drawing on engineering, architectural, academic, and scientific backgrounds. Together, we share a vision to create a more sustainable and equitable built environment for all. We recognise the urgent need to cut carbon and reduce our reliance on fossil fuels. We also understand our responsibility to respond to a climate that is already changing. We support this transition through a range of environmental services. These include support for planning, energy and retrofit projects, climate adaptation strategies for buildings and public spaces, zero-waste approaches, and sustainability certification.

Client Team

C40 Cities



C40 Cities is a network of nearly 100 mayors from the world’s leading cities who are working to take the urgent action needed to address the climate crisis and create a future where everyone, everywhere can thrive. The mayors of C40 cities are committed to using a science-based, people-centred approach to help the world limit global warming to 1.5°C and build healthy, equitable and resilient communities. The strategic direction of the C40 Cities is determined by an elected Steering Committee of C40 mayors, currently co-chaired by Mayor Sadiq Khan of London, United Kingdom, and Mayor Yvonne Aki-Sawyer of Freetown, Sierra Leone.

Carrier



Carrier Global Corporation, global leader in intelligent climate and energy solutions, is committed to creating innovations that bring comfort, safety and sustainability to life. Through cutting-edge advancements in climate solutions such as temperature control, air quality and transportation, we improve lives, empower critical industries and ensure the safe transport of food, life-saving medicines and more. Since inventing modern air conditioning in 1902, we lead with purpose: enhancing the lives we live and the world we share. We continue to lead because of our world-class, inclusive workforce that puts the customer at the center of everything we do. For more information, visit carrier.com or follow Carrier on social media at @Carrier. Carrier. For the World We Share.



Shade the UK

Shade the UK is a community interest company (CIC) focused on adapting buildings and public spaces to protect people from the impacts of a changing climate. Shade the UK’s guiding mission is to reach zero deaths from overheating in the UK and to ensure the health and wellbeing of vulnerable people is safeguarded during hot weather. We work collaboratively to raise awareness through campaigns, exhibitions, research, practical resources, and technical guidance.

Greater London Authority



The Greater London Authority (GLA) is the regional governance body for London. It comprises one Mayor and 25 Assembly Members who are elected by Londoners. With the support of appointed officials and City Hall’s staff they work to make London the best big city in the world. The GLA recognises climate change as a climate emergency that threatens the health and wellbeing of people and exacerbates inequalities in London. In response, the GLA has made progress in formulating and delivering a range of climate related policies, plans, programmes and projects. A number of strategies support long-term planning for the impacts of climate change including heat risk.

Related projects and programs

London Climate Resilience Review

The London Climate Resilience Review (LCRR) is an independent report commissioned by the Mayor of London following the extreme heat events which took place in the summer of 2022, to take stock of London’s preparations for climate impacts and make recommendations. The report was published in 2024, with key recommendations including the development of a regional strategic plan for adapting to heat in London, and the prioritisation of actions to make the existing built environment more climate resilient. It is within the context of these recommendations that the CRL project has emerged to address gaps in understanding around current and future cooling energy demand in London.

Pathways2Resilience

The Pathways2Resilience (P2R) programme is a European Union (EU) funded programme to support 40 regions to develop locally-led pathways towards a climate-resilient future. It will deliver against some of the recommendations from the London Climate Resilience Review, aims to address key barriers for London, and places a strong emphasis on community engagement. The key outputs of the P2R programme for the London region will be the Heat Ready London plan.

C40 Cool Cities Accelerator

The C40 Cool Cities Accelerator is a shared commitment for signatory cities to protect their residents from extreme heat. It focuses on both urgent life-saving actions and long-term urban adaptation and design transformation. London is a signatory of the Cool Cities Accelerator, along with other global cities, such as Accra, Quezon City, and Rio de Janeiro.

Project Management and Governance

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healthcare involves on-site staff, regular GP visits, personalised care plans, medication management, and often specialist support like dietitians or physiotherapists. For the general community, improving resident health involves addressing determinants of health like housing and poverty, promoting mental and physical wellbeing through community programs, and encouraging healthy activities.

Roadmap^{12,13} A roadmap is an informative, actionable, and evidence-based plan that shows how a policy area, product or service is likely to develop over time. It represents intentions not commitments. Roadmaps need to be easy to understand, and simple to adjust and update as when priorities or situations change.

Social justice The principle that all people should have fair and equitable access to opportunities, resources, and rights, while addressing and reducing systemic inequalities in society.

Sustainable, efficient and equitable cooling¹⁴ The provision of affordable and effective thermal comfort during hot weather through low carbon and low waste means that ensures the health and safety of Londoners, and targets the areas, buildings and people that need it most, when they need it most.

Unmet cooling demand The cooling energy required to keep internal spaces comfortable in buildings which do not currently have active cooling

Acronyms

BAR	Baseline Assessment Report
BAU	Business-as-usual
C40	C40 Cities
CDD	Cooling degree day
CIBSE	Chartered Institution of Building Services Engineers
CO2e	Carbon dioxide equivalent
DESNZ	Department for Energy Security and Net Zero
F-gas	Fluorinated gas
GLA	Greater London Authority
GP	General Practitioner
GWP	Global warming potential
IMD	Indices of Multiple Deprivation
LAEP	Local Area Energy Plan
LSOA	Lower Super Output Area
NHS	National Health Service
SEC	Sustainable, Efficient and Equitable Cooling
TM	Technical memorandum
UKCP	United Kingdom Concentration Pathway

3. Executive Summary

This is the final technical report of the Cooling Roadmap for London project (the CRL project) commissioned by C40 Cities, supported by the Greater London Authority (GLA) and funding support provided by Carrier. Analysis and conclusions are those of its authors and may not reflect the views of its sponsors.

It is one of four final deliverables for the project:

- A final technical report (this document) and appendices which provide a comprehensive and detailed account of the CRL project and the Cooling Roadmap for London (the CRL) itself.
- A 20-page public facing summary report which provides a succinct overview of the CRL project.
- A standalone two-page executive summary which provides a snapshot of the CRL project.
- A Baseline Assessment Report which provides a detailed review of existing publicly available data related to heat vulnerability and cooling energy demand in London, a baseline of cooling energy demand and projections of how this might evolve.

Overview

The CRL provides a strategic framework for sustainable cooling in the capital over the next 25+ years. The outputs from the CRL project will inform the Heat Ready London plan. They will also contribute to meeting the delivery ambitions of the Mayoral Mandate on ‘Delivering a Greener and More Climate-Resilient London’ and London’s C40 ‘Cool Cities Accelerator’ commitments.

In November 2024, in-kind funding was provided by Carrier for C40 Cities to commission ‘Cooling Roadmaps’ for two cities. After a competitive selection process, London and Quezon City in the Philippines were chosen. The overall aim of the CRL project, supported by the GLA, is to consider the interplay between cooling-related energy demand,

potential cooling poverty and heat-related health risks in London. Temperatures in London are rising due to climate change, and the city’s dense building stock contributes to a pronounced urban heat island (UHI) effect. This is compounded by a high concentration of poorly insulated and poorly ventilated buildings, a growing heat-vulnerable population, and increasing pressures on critical infrastructure and the energy grid. Together, these factors place London at the forefront of the UK’s cooling challenge, requiring a more urgent and tailored approach to managing thermal comfort, health, and cooling energy demand whilst addressing the disproportionate impacts of climate change and social injustice.

The energy required to maintain comfortable and safe indoor temperatures in London under a Business as Usual (BAU) scenario could **more than double by 2050** (compared to the 2025 baseline). This energy requirement could reach up to **17 TWh per year by 2050** with high uptake of active cooling, and could exceed **40 TWh per year by 2080**.

This trajectory is not inevitable. It reflects a scenario in which rising temperatures due to climate change are primarily met with increasing installation and use of active cooling systems, including air conditioning (AC).

The CRL demonstrates that an alternative pathway is possible. Under a Sustainable, Efficient and Equitable Cooling (SEC) scenario that prioritises passive measures, nature-based cooling, efficient systems and equitable deployment, London’s cooling energy demand could be reduced by:

- **0.3–0.4 TWh per year by 2030 (≈4% reduction compared to BAU)**
- **Up to 2.2 TWh per year by 2050 (≈15% reduction compared to BAU)**

These reductions are achieved while improving heat-related health outcomes, reducing cooling inequity, and easing pressure on the energy grid.

The choice facing London, therefore, is not whether cooling energy demand will rise, but whether it rises in a way that is unmanaged and unjust or in a way which is strategic, efficient, and equitable.

Project significance

London’s heat risk is shaped by five interacting factors:

- Located in the warmest region of the country.
- [The urban heat island effect](#).
- Building stock made up of older, poorly insulated buildings and newer, poorly ventilated and unshaded buildings.
- A growing heat-vulnerable population.
- Increasing pressure on critical infrastructure and the energy grid.

Heat is already contributing to premature mortality and ill health in London, with vulnerable people disproportionately impacted. As temperatures rise, unmanaged growth in cooling energy demand could increase carbon emissions, add to energy grid stress, and result in cooling poverty, where some Londoners can afford active cooling and others cannot. The CRL reframes cooling as both a climate resilience issue and a social justice issue.

The focus sectors

The CRL prioritises three critical sectors where heat risk is most acute:

- **Social housing**
- **Social care**
- **Healthcare**

Buildings in these focus sectors are home to, and care for, some of the most heat-vulnerable people in London. Many are difficult to keep sufficiently cool, securing financing is challenging, and many occupants have limited agency to adapt their environments.

The intention is that other sectors will be able to translate or replicate relevant findings from the CRL

project to achieve sustainable cooling, in keeping with the Mayoral Mandate on ‘Delivering a Greener and More Climate-Resilient London’.

Project objectives

The CRL project aims to address the following three interconnected strategic objectives:

- **Reduce cooling energy demand in focus sector buildings.**
- **Address potential cooling poverty and cooling inequity in and around focus sector buildings.**
- **Protect the health of heat-vulnerable people in focus sector buildings.**

The Cooling Roadmap for London

The CRL sets out 19 ‘options for action’ (see Figure 5 on page 18) to address the identified gaps in policy and practice over the next 25+ years. The intention of the options for action is to guide London away from the projected increases, under the BAU scenario, in cooling energy demand, potential cooling poverty, and heat-related health impacts within the focus sectors and towards the ‘Sustainable, Efficient and Equitable Cooling’ (SEC) scenario. The SEC scenario represents the potential London-wide outcomes if the options for actions within the CRL are implemented.

The options for action have been grouped into four themes:

- **Policy and Governance (P)** – existing legislation, policies and guidance relating to sustainable, efficient and equitable cooling.
- **Buildings and Technology (B)** - the planning, design and engineering of London’s buildings, using appropriate technology, to achieve sustainable, efficient and equitable cooling.
- **Community and Culture (C)** - meaningful engagement with communities of interest, greater public and professional awareness and normalising of sustainable, efficient and equitable cooling practices.
- **Landscape and Public Realm (L)** – the planning, design, and management of London’s urban landscape and public realm to achieve sustainable, efficient and equitable cooling.

Borough-level implications

The CRL framework has been tested with two London boroughs to understand how cooling energy demand trajectories and intervention priorities differ across borough contexts. A multi-criteria analysis of London's 32 boroughs informed the selection process to ensure representation of inner- and outer-London boroughs with high heat risk neighbourhoods. This testing and analysis demonstrates:

- Cooling challenges and heat vulnerability are spatially uneven across London.
- Cooling energy demand is greatly influenced by building type and uses.
- A city-wide strategy must be adaptable at the borough-level.

A more granular understanding of heat exposure and vulnerability within buildings will be essential to prioritise future investment effectively.

Future cooling scenarios: BAU vs SEC

Business As Usual (BAU) scenario

This scenario assumes growing reliance on active cooling, such as AC, to maintain comfort, with limited coordination or prioritisation of deployment, and estimates that:

- Cooling energy demand more than doubles by 2050 (up to 17 TWh per year).
- Growth in demand accelerates after 2035–2040 as active cooling becomes widespread.
- Annual cooling energy demand could exceed 40 TWh per year by 2080.

While this may reduce indoor temperatures, it risks:

- Increased energy demand during heatwaves.
- Greater stress on critical infrastructure and energy grid
- Higher carbon and waste heat emissions.
- Deepening cooling poverty.
- A positive feedback loop where increased active cooling dumps more heat outside, raising ambient temperatures and driving even greater cooling demand.

Active cooling plays a vital role in keeping Londoners healthy and safe, but over reliance on it will have adverse consequences.

Sustainable, Efficient and Equitable Cooling (SEC) scenario

The SEC scenario represents the potential city-wide outcomes if the options for actions in the CRL are implemented. To achieve SEC, the following cooling measures must be prioritised:

- Passive and nature-based cooling.
- Improved building design and retrofit standards.
- Efficient and correctly sized active cooling systems.
- Operational optimisation and skills.
- Targeted investment in vulnerable building sectors.

Under the SEC scenario:

- Cooling energy demand growth is moderated.
- Peak cooling loads are flattened.
- Active and passive cooling provision becomes more equitable.
- Buildings both generate and absorb less heat.

Importantly, SEC does not eliminate active cooling. Rather, it ensures that where active cooling is required, particularly in the focus sectors, it is efficient, appropriately deployed and supported by passive and nature-based measures.

Strategic implications for London

The CRL makes five strategic insights clear:

- 1. The rise in cooling energy demand is a resilience risk.** Without intervention, London faces rising energy demand and infrastructure pressure during extreme heat events.
- 2. Cooling inequity is a social justice issue.** Vulnerable residents are disproportionately impacted by heat and least able to afford active cooling.
- 3. Delay increases lock-in risk.** If buildings are retrofitted for winter performance only, or default to active cooling as a first response, cooling energy demand will escalate.

- 4. Passive-first and nature-based action reduces long-term active cooling costs.** Buildings that absorb less heat require smaller, cheaper and more efficient active cooling systems.
- 5. Cooling is cross-cutting.** Solutions must be co-ordinated with retrofit policy, public health, biodiversity, energy planning, housing strategy and climate adaptation.

Conclusion

Following a BAU trajectory puts London at risk of a rapid increase in cooling energy demand and social inequity. However, this is not inevitable. The SEC pathway demonstrates that cooling energy demand growth can be moderated in ways that:

- Protect vulnerable Londoners, safeguarding health, lives, livelihoods and social justice.
- Reduce long-term critical infrastructure pressure, supporting the city's resilience.
- Deliver measurable cooling energy and carbon savings, aligning with London's net zero targets.
- Promote nature-based solutions, enhancing biodiversity and contributing to water resilience.

Collectively, the CRL positions London to become a global leader in sustainable, efficient and equitable cooling, demonstrating how major cities can respond to rising heat risk without locking themselves into high-carbon, inequitable cooling futures.

4. Introduction

Heat risk in London

As the UK’s largest city, located in the warmest southeast region, London is uniquely exposed to rising temperatures compared to the rest of the country. Its dense building stock, uneven distribution of green and blue space, high proportion of artificial surface materials, and heat generating equipment and activities, result in a pronounced urban heat island effect.

This means parts of London can be several degrees hotter than surrounding rural or greener areas, especially at night¹⁵. This is compounded by vulnerabilities in London’s aging housing stock, which is generally not designed for a changing climate and often lacks adequate shading, insulation and ventilation. Further, there is growing strain on London’s critical infrastructure, the energy grid, and an increasingly heat-vulnerable population.

Record-breaking temperatures of over 40°C in the summer of 2022 resulted in approximately 2,985 heat-related deaths, with an estimated 387 deaths in London, and a national Level 4 Heatwave Alert was triggered for the first time ever in England¹⁶. With the successive 30°C+ heatwaves during the summer of 2025, the UK’s hottest ever summer¹⁷, it is clear that London needs to take more urgent action to adapt to hot weather.

Anyone can experience heat stress, heat exhaustion, heatstroke, or heat-related mortality when exposed to heat for a prolonged period, either indoors or outdoors. The 2022 heatwaves were far more intense and widespread than previous heatwaves, which meant impacts beyond the health and social care system, and even fit and healthy people were at risk.

However, heat disproportionately impacts vulnerable populations, this includes, but is not limited to:

- Older people
- Young children
- Pregnant people
- People with a physical or mental health conditions
- Disabled people
- Low-income groups
- Ethnic minority communities
- People experiencing homelessness
- Outdoor workers

A full review of heat-related health impacts can be found in Appendix A.

Extreme heat events cause disruptions to transport networks and place pressure on water, energy, and telecommunication demand. Railway lines and road networks can be strained at very high temperatures as they buckle and melt, leading to severe disruptions and financial losses. Furthermore, excess heat leads to surges in water and energy demand, with the risk of overwhelming existing networks.

Natural systems are also severely disrupted and recover slowly from extreme heat. This can have subsequent impacts on food production and an increased risk of disasters, such as wildfires, with cascading impacts on the economy and society.

The economic impacts of heat exposure are estimated to be £260-300 million per year. This figure is expected to triple by 2050 due to losses in potential labour hours and risk of excessively high working temperatures, such as in the construction industry¹⁸.

The sustainable cooling challenge

Widespread use of active cooling products and systems, for example air conditioning (AC), in buildings outside the office, retail and hospitality sector, is not currently ‘the norm’ in London. This, leaves vulnerable occupants and building users at risk during heatwaves. Most homes in London do

not currently have active cooling systems installed, and those homes that do tend to be at the higher price level and newer end of the residential market. However, installation rates are increasing and, as a result, domestic cooling energy demand is expected to rise and become a more substantial contributor to London’s total annual cooling energy demand¹⁹.

In addition, London is still experiencing a cost-of-living crisis, with personal and household budgets tight and public sector finances stretched to meet competing demands and priorities.

Potential ‘cooling poverty’ is emerging; those who need active cooling most are often least able to afford it, while those who can afford it are more likely to adopt inefficient active cooling systems. Cooling poverty is exacerbated by the waste heat generated by active cooling systems, which contributes to the warming of environments around buildings with (actively) cooler internal spaces. This adds to heat risk for those without access to cool spaces, and compounding ‘cooling inequity’.

Within the context of climate change and heat risk, a better understanding of how limited resources can be deployed to achieve ‘the greatest good for the greatest number’ in terms of value for money, and

positive environmental and social impact, is key. Furthermore, London does not exist in isolation. It is a complex urban, climatic and ecological ‘system of systems’, with diverse and inter-related sectors, buildings, stakeholders, people and environments.

Therefore, this report acknowledges that efforts to adapt to hotter weather in London need to be considered in collaboration with relevant cross-sector stakeholders at the global, national, regional and local level, and those who represent the buildings and people in the public, private, voluntary and community sectors.

Together, these factors put London at the forefront of the UK’s heat risk challenge, requiring an urgent, place-based and people-centred approach to effectively manage thermal comfort, safeguard public health, and address future energy needs.

London is also well positioned to reframe this challenge as an opportunity to put environmental, social and economic justice at the heart of action to prepare for, respond to and recover from heat impacts in the context of climate change.



The focus sectors

The CRL project has focused on three priority sectors (‘the focus sectors’), the intention being that other sectors will be able to translate or replicate relevant findings. The focus sectors are the social housing, social care and healthcare sectors as buildings within them are home to, and care for, some of the most heat-vulnerable people in London. Buildings in these sectors which overheat, and which do not have appropriate cooling measures, put vulnerable people at risk during heatwaves.

Most spaces in these buildings rely on passive cooling measures, which are not always enough to maintain comfortable and safe indoor temperatures.

Temporary active cooling solutions (for example additional fans or portable air conditioning units) tend to be deployed during periods of extreme heat, and there is limited capacity or funding for major building upgrades to improve thermal comfort.

The focus sectors need to be considered both individually and in combination, as while they have distinctive features, they do not exist in isolation and are intrinsically linked. As heat-related health impacts are experienced across complex settings within the focus sectors, a strategic and coordinated approach to reducing heat risk while minimising cooling energy demand is needed.

Full profiles on the focus sectors and their interconnectedness with regard to heat-related health impacts can be found in Appendix A.

Healthcare

London’s healthcare sector is characterised by an exceptionally mixed and ageing building stock. This architectural diversity contributes to a large variation in thermal performance, ventilation strategies, and resilience to overheating. The sector includes, but is not limited to, hospitals, primary care clinics, GP practices, urgent treatment centres, community health centres, hospice care facilities, pharmacies, and specialist mental health buildings. Across these settings, heat risk is very high, driven by the high vulnerability of patients. The increase in heat-related illnesses amongst vulnerable populations is expected to further burden the health care sector within London due to increased hospital admissions and mortality.

Healthcare buildings, particularly hospitals, have a high risk of overheating, even during moderate outdoor temperatures²⁶. Healthcare buildings themselves pose a risk to vulnerable people during warm weather, and, within London, hospitals located within the central and eastern regions demonstrate the highest heat risk²⁷. While critical areas such as operating theatres and intensive care units may have active cooling, many general wards, outpatient spaces, and waiting areas lack active cooling, leaving patients and staff exposed to elevated indoor temperatures during heat events.

In addition to the risk to vulnerable patients, hospital infrastructure itself is not resilient to heat stress and the evidence of disruption to service delivery is increasing. **Major London hospitals had to declare a heat-related ‘critical site incident’ in July 2022, when the 40°C temperatures led to the failure of two data centres at Guy’s Hospital and St Thomas’ Hospital²⁸.** This took down most of the clinical IT systems at Guy’s, St Thomas’ and Evelina London hospitals and related community services. Staff had to resort to a paper-based operating model (a ‘Paper Hospital’ situation) to support clinical activity. The technical recovery of IT systems took several weeks and cost the NHS over £1.4 million pounds for one incident .

The sector faces multiple structural and operational barriers to implementing more resilient cooling solutions. The overstretched NHS budget constrains large-scale investment, and major works can cause severe service disruption.

Social Care

The social care sector in London comprises a wide range of building types serving people with a range of support needs. The sector includes, but is not limited to, elderly residential care homes, day centres, group homes, independent living facilities, child and youth care homes, nurseries, mental health centres, rehabilitation centres. The majority of residents in elderly care often have complex health conditions, limited mobility, and reduced ability to regulate body temperature, making indoor temperatures a critical determinant of health and wellbeing. Many care homes and social care facilities do not have comfort cooling and, during heatwaves, often rely on portable or temporary air conditioning units, which are typically inefficient, noisy, and challenging to operate at scale.

People aged over 65 years spend more than 80% of their time indoors, with this rising to 90% for people aged over 85 years²⁴. Older residents in care settings face the highest risk of heat-related mortality among their age group. Risks are further heightened for people with cognitive impairments, dementia, or learning disabilities, who may struggle to recognise heat dangers, adjust their behaviour, or communicate their needs, placing a heavy responsibility on care staff to manage indoor environments proactively.

Overheating is already occurring in parts of the sector even during average summer conditions, and projected climate warming is expected to worsen this substantially²⁵. Despite the clear risks, the sector faces substantial barriers to adaptation. Rising costs (including utilities) and limited access to capital funding potentially limit the capacity of providers to install shading, improve ventilation, or undertake heat risk assessments. Basic passive cooling strategies are often underutilised, as window opening patterns and ventilation practices can be poorly understood or difficult to implement safely for vulnerable residents.

Social Housing

The social housing sector in London encompasses a large, varied, and ageing building stock, with approximately 800,000 homes owned by local authorities and housing associations²⁰. Crucially, the sector faces high levels of heat risk driven by factors such as the density of estates, prevalence of single-aspect rooms, constrained layouts, unconsidered building orientation, and heat-vulnerable occupants²¹.

Over one million children in London are living in homes at risk of overheating, most of them within social rent homes, elevating the urgency of intervention²². Children living in flats also face additional heat-related dangers, such as risks of falling from height through open windows during hot weather, highlighting the intersection between thermal comfort and building safety²³.

Many residents in the sector, including low-income households, older adults, people with health conditions, and those experiencing social isolation or overcrowding, have limited capacity to cope with extreme heat or modify their environments. Despite this, most social housing does not have comfort cooling, and tenants typically cannot install passive cooling measures themselves, especially any external or building fabric-related interventions.

The sector faces multiple systemic barriers to adapting homes for rising temperatures. Funding constraints, increased utility costs, and competing priorities (including fire safety, cladding remediation, damp and mould, and fuel poverty reduction) place pressure on budgets.

Project objectives

The CRL project aims to address the following three interconnected strategic objectives:

- Reduce cooling energy demand in focus sector buildings.
- Address potential cooling poverty and cooling inequity in and around focus sector buildings.
- Protect the health of heat-vulnerable people in focus sector buildings.

The CRL project aims to achieve these objectives by:

- Assessing the impact of rising temperatures in London on cooling energy demand within buildings from 2026-2050, with a particular focus on 2026-2030 to align with London’s net zero carbon targets.
- Focusing on existing buildings in three focus sectors: social housing, social care and healthcare, and on areas of high deprivation and poverty, where focus sector buildings are located. These sectors have been chosen as they encompass buildings and groups of people that are particularly affected by, and vulnerable to, heat.
- Developing a CRL that guides London away from the projected increases in cooling energy demand, potential cooling poverty, and heat-related health impacts.
- Applying the CRL to two selected London boroughs, based on a multi-criteria analysis, to assess its usefulness within the context of local demographics, building stock, adopted planning policies, and green infrastructure provision.
- Contributing to the evidence base for the Heat Ready London plan.

This technical report summarises all the work relating to the CRL project, including:

1. Outputs from the Baseline Assessment Report (BAR), which provide a baseline understanding of current and future cooling energy demand, heat vulnerability areas, focus sector profiles, and heat-related health impacts in London.
2. The CRL itself, which is a flexible, optional action plan for achieving sustainable, efficient, and equitable cooling across London.

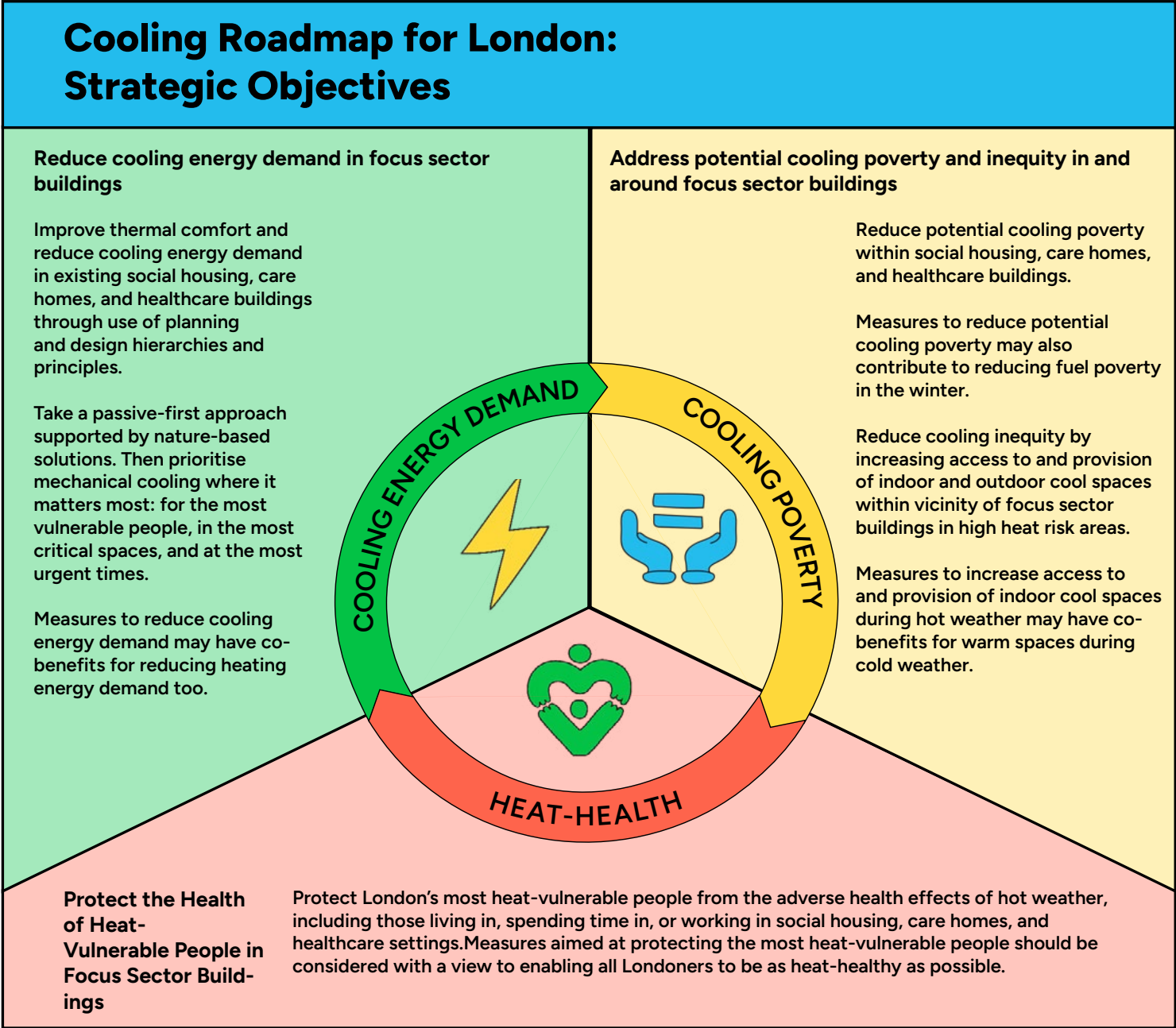


Figure 1: The three strategic objectives of the CRL project

5. Methodology

Governance and management

The CRL project has been commissioned by C40 Cities, supported by the GLA, funding support by Carrier, and delivered by Love Design Studio and Shade the UK. The project comprised fortnightly meetings with the C40 and GLA client team and the Love Design Studio project delivery team from May 2025 (project inception) to April 2026 (project completion).

Methodology

All work related to the CRL project is summarised and distilled into this technical report, including the CRL itself.

1. Baseline Assessment Report (BAR)

A review was undertaken of publicly available data related to heat vulnerability and cooling energy demand in London. A baseline range of the current annual cooling energy demand for London was estimated along with projections for how that cooling energy demand might change under a 'Business As Usual' (BAU) scenario, if no action is taken. As part of the BAR, reviews were also undertaken of relevant policy and regulation and heat-related health impacts in London.

2. Stakeholder Engagement

Three groups of stakeholders were identified for engagement to inform this project:

- Group A: Institutional stakeholders for data and information requests – to inform the BAR.
- Group B: Focus sector stakeholders for semi-structured interviews – to inform the BAR and the CRL.
- Group C: Borough-specific stakeholders representing the focus sectors – to inform the CRL.

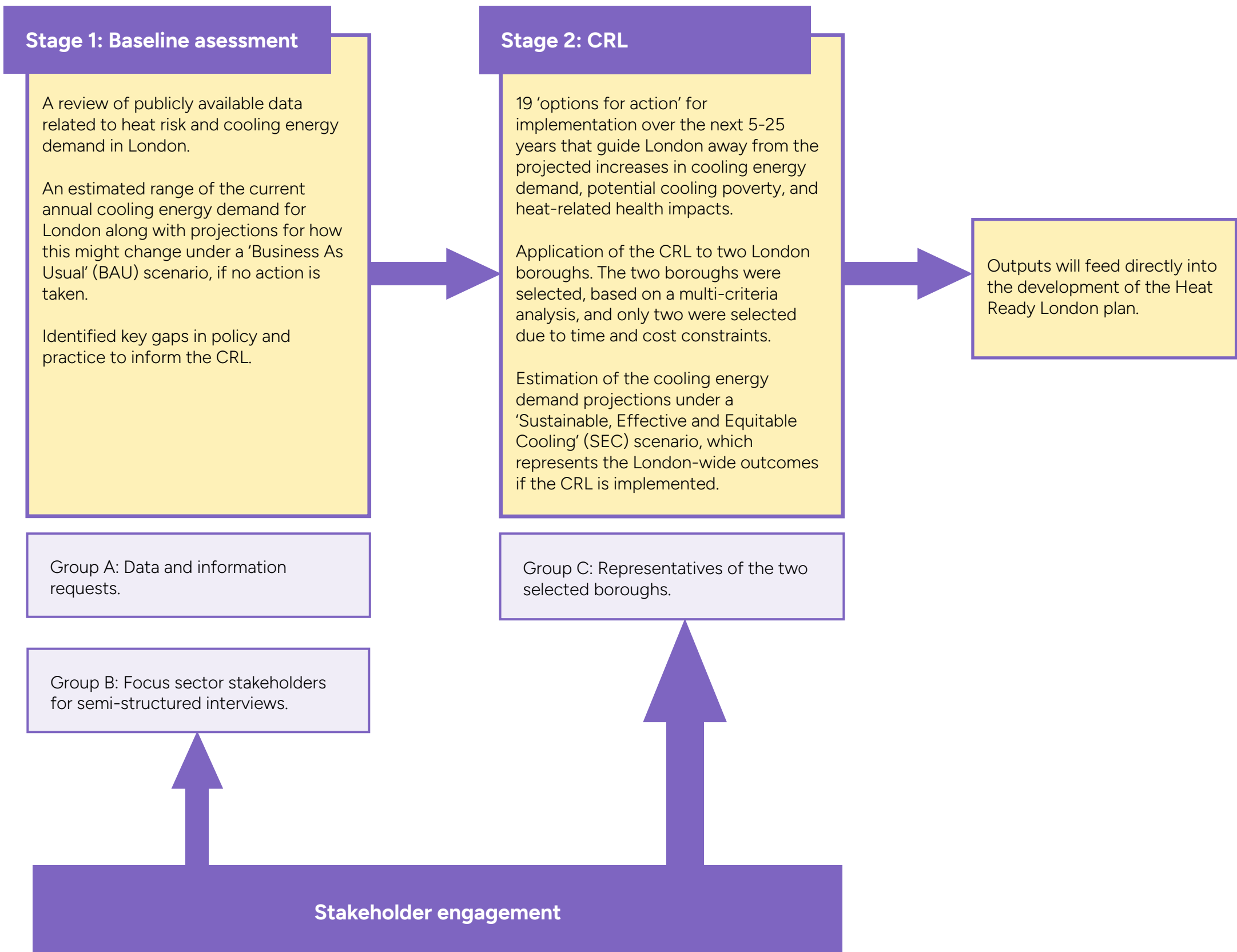


Figure 2: Outline of the CRL project process

The aims of the stakeholder engagement for the project are summarised below:

- To supplement the desk-based analysis of publicly available data with additional relevant data from institutional stakeholders, such as the GLA, London's boroughs, and energy providers. This was to ensure the BAR and the CRL reflect real-world data specific to London.
- To better understand the experiences of individuals from the focus sectors in terms of thermal comfort, overheating, and cooling. This was to help contextualise the quantitative data analysis and highlight practical considerations for the CRL specific to the three focus sectors.
- To encourage collaboration and transparency and ensure that the CRL is reflective of borough-specific populations and health profiles, other opportunities and challenges, and focus sector stakeholder priorities.

Within this context, a total of 56 stakeholders were approached and 33 stakeholders actively contributed to the project. This is broken down as follows:

- 28 potential Group A stakeholders were identified, 9 were prioritised and approached, and 5 responded.
- 15 Group B stakeholders took part in semi-structured interviews.
- 13 Group C stakeholders from two selected London boroughs, covering the climate, energy, placemaking, housing, social care, and public health teams. The Group C stakeholders took part in a two-hour online workshop.

Stakeholder engagement for this project was necessarily limited by the scope and short delivery timeframe, meaning that only a small number of stakeholders could be involved across the three groups. Engagement with Group B stakeholders focused on deepening understanding of heat-related experiences within the focus sectors, rather than consulting on CRL or its proposed options for action.

As a result, input on the CRL itself came primarily from Group C borough-level stakeholders via the online workshop.

A multi-criteria analysis was undertaken of London's 32 boroughs to select the two boroughs for the Group C stakeholders. These included the proportion of sensitive population, healthcare, social care and social housing buildings, public green space, policy frameworks, and population density.

More details on the cross-borough analysis and selection criteria is found in Appendix B.

3. Cooling Roadmap for London (CRL)

3.1 Options for action

A CRL was created consisting of 19 'options for action' for implementation over the next 25 years to contribute to meeting the strategic objectives of the CRL project. This time period was selected with a particular focus on 2026-2030 to align with London's net zero targets and with a wider view from 2030-2050 to align with national net zero targets.

The options for action were distilled into four themes, based on the seven gaps in policy and action identified in the BAR:

→ **Policy and Governance (P)** – relating to existing legislation, policies, and guidance relevant to sustainable, efficient and equitable cooling.

→ **Buildings and Technology (B)** – relating to the planning, design, and engineering of London's buildings, using appropriate technology, to achieve sustainable, efficient and equitable cooling.

→ **Community and Culture (C)** – relating to meaningful engagement with communities, greater public and professional awareness, and normalising sustainable, efficient and equitable cooling practices.

→ **Landscape and Public Realm (L)** – relating to the planning, design, and management of London's urban landscape and public realm to achieve sustainable, efficient and equitable cooling.

The options for action under the 'Policy and Governance' and 'Community and Culture' themes can be broadly considered as creating the 'enabling environment' for those within the 'Buildings and Technology' and 'Landscape and Public Realm' themes to be effectively developed and implemented. The options for action were then analysed in terms of their impact on the three strategic objectives of the project outlined in Figure 1.

3.2 The 'Sustainable, Effective and Equitable Cooling' (SEC) Scenario

The intention of the CRL is to guide London away from the projected increases, under the BAU scenario, in cooling energy demand, potential cool poverty, and heat-related health impacts within the focus sectors and towards the 'Sustainable, Effective and Equitable Cooling' (SEC) scenario. The SEC scenario represents the London-wide outcomes if the options for actions within the CRL are implemented.

A phased breakdown of how the CRL could mitigate the rapid increase in cooling energy demand over the immediate-to-short, medium and long-term has been estimated and summarised in Appendix E.

3.3 Borough analysis

The CRL was then applied to the two selected London boroughs. The purpose of this exercise was to assess the CRL's usefulness within a real-world local authority.

This is in keeping with the GLA's 'Delivering a Greener and More Climate-Resilient London Mandate', specifically the theme of 'Convening partnership action on climate resilience, specifically undertaking proof of concept pilots to identify scalable ways to retrofit buildings to reduce the threat to Londoners from extreme heat'.

Assumptions

The methodology for developing the CRL assumes all existing relevant policies, hierarchies, and targets within the current London Plan, and supporting documents, are adhered to as a minimum. Specifically, those relating to climate change, cooling, energy, carbon, the urban heat island, urban greening, green and blue infrastructure, and waste. This includes the GLA's Mayoral Mandate and associated Delivery Plan for 'Delivering a Greener and More Climate Resilient London'. It is also assumed that relevant industry and sector-specific regulations and good practice are adhered to as a minimum. A summary of some of the key relevant policies and regulations is provided in the BAR.

Limitations

The UK is at a relatively early stage of research into understanding cooling energy demand at the city or local authority level. Therefore, there is limited availability of robust data on current and future cooling energy demand in London.

This project represents a small but important step forward in highlighting this, working within the funding and data constraints of this project, to focus on an approach to data collation and analysis that can be developed and replicated for other building sectors and London boroughs.

The scenario-based approach

Estimating the impact of the options for action on cooling energy demand required a scenario-based methodology. It is not possible to directly map how each option for action will translate into specific building-level measures across London's diverse building stock. Instead, the assessment considered how successful implementation of the options for action could reasonably be expected to influence building design practices, retrofit behaviours, technology choices, and urban form over time.

To do this, a series of SEC scenario assumptions were developed, year-by-year, that represent what 'good' could look like if the options for action were effectively adopted in a phased way. These assumptions were informed by engineering judgement, building physics principles, and

precedent from good practice case studies. They were applied consistently across the building stock model to test how cooling energy demand could change under improved fabric performance, increased passive cooling measures, reduced reliance on active cooling, and more climate-responsive urban environments.

For this reason, the CRL does not take the form of a traditional overheating or building performance study based on iterative building-level improvements. Instead, it uses scenario modelling to illustrate how London's cooling energy demand trajectory could change if the CRL options for action are successfully implemented at scale over time. This approach is more appropriate to the purpose of a strategic roadmap in that it demonstrates how coordinated efforts across policies, buildings, communities and the public realm could shift outcomes city-wide, rather than attempting to attribute precise cooling energy savings to individual measures in isolation.

The detailed assumptions and limitations for this project can be found in Appendix C.

6. Baseline Cooling Energy Demand

Future climate projections

Global temperatures have already exceeded 1.5°C as an average above pre-industrial levels for twelve consecutive months and existing international policies are not expected to keep global warming below 2°C²⁹. The UK's Climate Change Committee (CCC) has advised the UK government to prepare for 2°C of global warming by 2050 and plan for up to 4°C of warming by 2080³⁰. Therefore, the prevailing consensus is that London's future climate will be substantially warmer than it is now and the city will experience progressively longer and hotter summers.

London is already experiencing impacts from rising temperatures and faces increasing heat risk, primarily driven by climate change, the urban heat island effect, rapid urbanisation, and a growing and ageing population³¹. These changes in heat exposure and heat vulnerability are driving an increase in demand for, and uptake of, active cooling, such as air conditioning (AC).

Cooling Degree Days (CDDs) are a measure of the number of degrees that a day's average temperature is above a defined threshold in any given location. They can be used to monitor cooling energy use. Based on Met Office data, CDDs for London are projected to increase substantially between 2025 and 2080³².

This was established using a baseline date range for CDDs (2001–2020), which corresponds to observed global warming of 0.87°C above pre-industrial levels for the same period. The projected number of CDDs for 2080 align with a projected 3°C of global warming by the 2080s. This represents the possibility of global temperature increase greater than 2°C, but not as high as 4°C.

Key findings

The findings of the BAR indicate that London is on a BAU pathway where both heat risk and cooling energy demand are projected to rise sharply through the century, with disproportionate and adverse impacts on vulnerable groups of people.

Even under conservative assumptions, cooling energy demand more than doubles by 2050 compared to the baseline range established for 2025. Under the higher cooling-uptake and use trajectories, cooling energy demand by 2080 could be over 40 TWh per year (Figure 3). The rate of change becomes steeper after 2035–2040, coinciding with the accelerated adoption of AC.

Drivers of increased cooling demand

The projected escalation in cooling energy demand under the BAU scenario arises from three compounding factors:

- Increased uptake of active cooling – this reflects a shift toward permanent active cooling solutions across the building stock, not just portable fans or 'spot cooling' where portable air conditioning units are used to cool air in a specific area within a space, rather than the whole space.
- Higher external temperatures – more frequent, longer, and more intense heatwaves and higher average summer temperatures driving every day cooling use.
- The urban heat island effect – particularly in central London boroughs and areas with limited greenery or high proportion of impermeable surface cover.

Growing vulnerability and heat-related health inequality

London's population is growing, from approximately 9.8 million people in 2025 to a projected 10.2 million people by 2050³³. Much of this growth will be accommodated in already densely populated boroughs. Alongside general population increase, the proportion of heat-vulnerable groups or people (for example, older adults, those with long-term illnesses, and socially-isolated individuals) is rising.

Despite overall improvements, healthy life expectancy varies substantially within London, reflecting structural inequalities across the city, including the quality and cost of housing and access to good quality green spaces³⁴.

Potential cooling poverty is emerging; those who need active cooling the most are often least able to afford it, while those who can afford it are more likely to adopt inefficient active cooling systems³⁵.

Potential cooling poverty is exacerbated by the waste heat generated by active cooling systems, which contributes to the warming of environments around buildings with (actively) cooler internal spaces, adding to heat risk for those without access to cool spaces, and compounding cooling inequity³⁶.

Health and economic consequences under BAU

Continuing on a BAU pathway could lead to:

- A positive feedback loop, with adverse impacts for Londoners' health, London's energy grid, critical infrastructure, and the economy, and for social, environmental and environmental inequity.
- Higher rates of heat-related morbidity and mortality for people without access to either active cooling in indoor spaces or to cooler outdoor spaces, and for those who are unable to acclimatise and adapt to warmer indoor and outdoor temperatures.
- Loss of human productivity for people who are unable to access cooling (either active or passive, indoor or outdoor) or to adapt their activities and behaviours due to the nature of their work, affecting London's economic output.

- Higher long-term operational costs for social housing landlords, social care providers, and healthcare estate, in terms of energy bills and reactive responses to heat-related health issues.

Current and projected cooling energy demand

A baseline range of the annual cooling energy demand for London was estimated. This included current cooling energy demand as well as projections under a ‘Business-As-Usual’ (BAU) scenario, if no action is taken.

Within the BAU scenario, three trajectories (BAU 1, 2 and 3) were developed to gauge how cooling energy demand may change from 2025 to 2080, with a lower (low) and upper (high) projection established for each trajectory. The year 2080 was chosen as the end year for the projections as the Met Office CDD data used to inform the rate of increase in annual cooling energy demand was taken from the 3.0°C global warming dataset. It has been assumed that this level of global warming is likely to occur by 2080.

A description of the three trajectories are provided below:

BAU 1: Increasing ambient temperatures only

1a. Low cooling energy demand: annual cooling energy demand has been scaled with increasing CDDs based on the ‘median’ data set produced by the Met Office.

1b. High cooling energy demand: same as BAU 1a but using the baseline (high) estimate value for cooling energy demand as the starting figure for 2025.

BAU 2: Increasing ambient temperatures and ageing population

2a. Low cooling energy demand: same as BAU 1a but with baseline annual cooling energy demand figures for the domestic and health sector scaled with a projected increase in over 65-year-old population in London, based on the GLA Population Projections Explorer³⁷.

2b. High cooling energy demand: same as BAU 2a but using the baseline (high) estimate value for cooling energy demand as the starting figure for 2025.

BAU 3: Increasing ambient temperatures and uptake of active cooling systems

3a. Low cooling energy demand: same as BAU 1a but with an increasing uptake of active cooling systems and related cooling energy demand. This is assumed to grow at 5% annually in domestic buildings and 2% in non-domestic buildings.

3b. High cooling energy demand: same as 3a but using the baseline (high) estimate value for cooling energy demand as the starting figure for 2025.

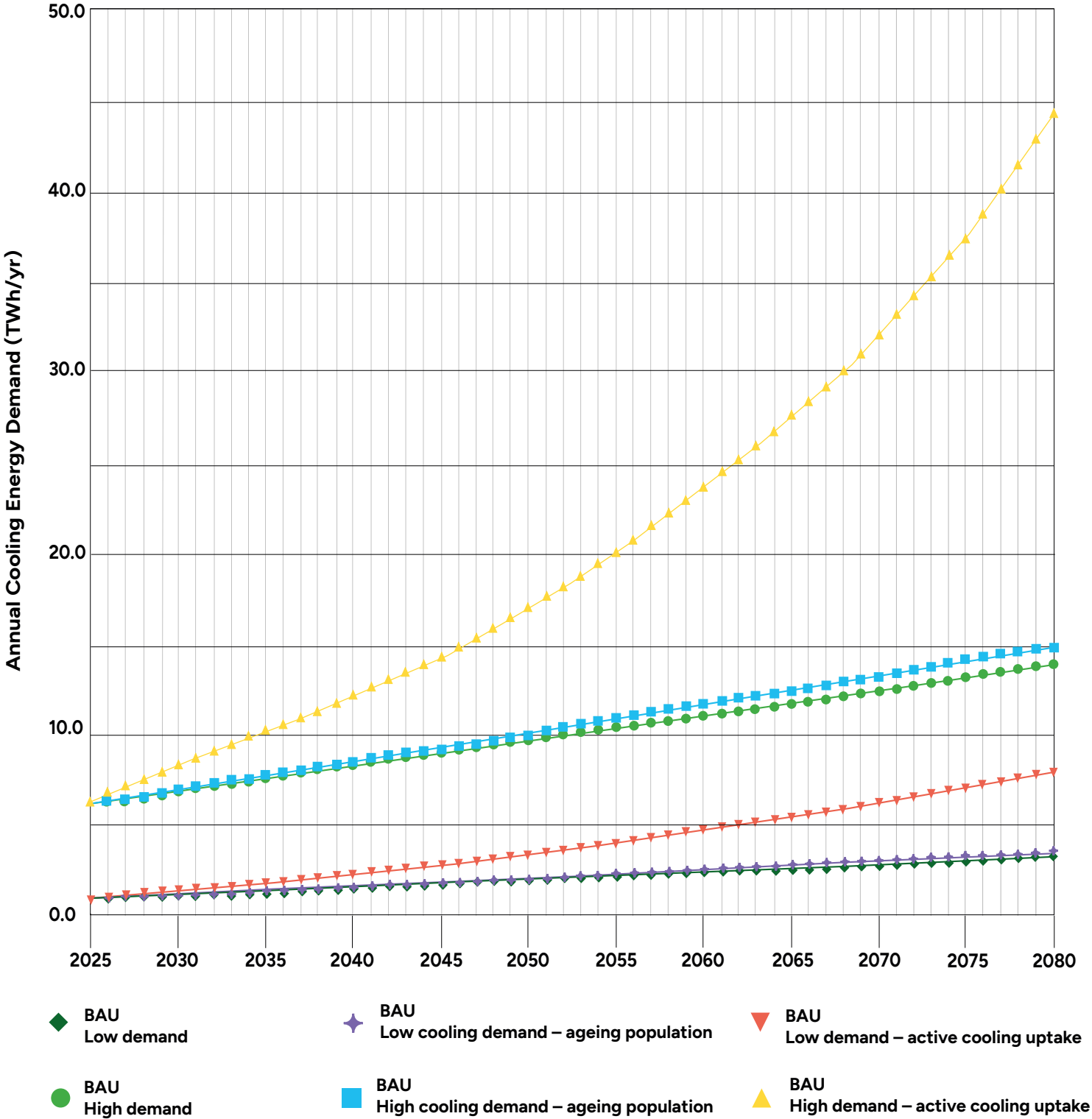


Figure 3: Baseline cooling energy demand projections for London from the BAR (2025-2080)

Implications for the CRL

The BAR concludes that following the BAU trajectory puts London at risk of a steep increase in cooling energy demand and social inequity.

The CRL offers an opportunity to build on and enhance existing and developing policy on overheating, climate resilience, and low-carbon energy in London. The BAR identified the following seven gaps in policy and practice that the CRL aims to address.

- 1. Vulnerable buildings sectors are overlooked.** The focus sectors are uniquely exposed because residents and occupants often cannot relocate, control their environments, nor tolerate heat. Existing adaptation and resilience strategies highlight the need to address overheating risks in the focus sectors; however, they are not yet benefitting from adaptation retrofits.
- 2. Passive and active cooling are not well integrated.** We must reduce the need for active cooling without simply accommodating to the rising demand for it. Although current policy emphasises passive cooling measures, it lacks guidance on when active cooling is essential for high-risk buildings to protect vulnerable people.
- 3. Inconsistent and incomplete cooling data.** London lacks consistent and accessible data on cooling systems and cooling provision in critical sectors. This limits effective energy planning and adaptation.
- 4. Cooling needs are not aligned with energy planning.** Local area energy plans rarely consider rising cooling energy demand or opportunities to integrate waste heat and electricity, or heat and cooling networks.
- 5. Outdoor cooling strategies are uncoordinated.** Urban greening and shading efforts are often not coordinated across various actors, leading to fragmented efforts and varying outcomes for heat-related health, as well as for indoor and outdoor thermal comfort.
- 6. Indirect cooling systems are not fully considered.** Non-human-focused cooling infrastructure, such as data centre cooling, refrigeration in food systems, and transport-related cooling, has important indirect effects on human wellbeing and health. Failures in cold-chain logistics can compromise food and medicine safety during heatwaves and effective cooling in public transport is essential for mobility, particularly for older and disabled users.
- 7. Lack of governance and regulation on cooling.** There is currently no coordinated register of cooling-related refrigerants across London, despite their climate implications and prevalence. There is also no statutory requirement for monitoring or reducing indoor heat risk in most existing buildings.



7. Cooling Roadmap for London

The roadmap

A roadmap is an informative, actionable, and evidence-based plan that shows how a policy area, product, or service is likely to develop over time. It represents intentions, not commitments. Roadmaps need to be easy to understand and simple to update as priorities or situations change.

The ‘Cooling Roadmap for London’ (the CRL) comprises the following:

- 19 ‘options for action’ to achieve sustainable, efficient, and equitable cooling in London over the next 25+ years (2026-2050).
- An estimation of cooling energy demand under a Sustainable, Efficient and Equitable Cooling (SEC) scenario, whereby the CRL is implemented across London.
- Application of the London-wide CRL to two London boroughs.

The 19 options for actions are grouped into four themes:

Policy and Governance (P.01-P.06) – existing legislation, policies and guidance.

Buildings and Technology (B.01-B.05) – the planning, design, and engineering of London’s buildings and using appropriate technology.

Community and Culture (C.01-C.04) – meaningful engagement with communities, greater public and professional awareness, and normalising sustainable cooling practices.

Landscape and Public Realm (L.01-L.04) – the planning, design, and management of London’s urban landscape and public realm.

The detailed options for actions are set out in Section 7.1.

The fundamentals of sustainable cooling

It is generally understood within the UK built environment industry that a core set of physical, environmental, and operational measures are required to reduce cooling energy demand and reduce overheating risk in buildings. These measures are referred to in this section of the report as the ‘fundamentals’ of sustainable, efficient, and equitable cooling.

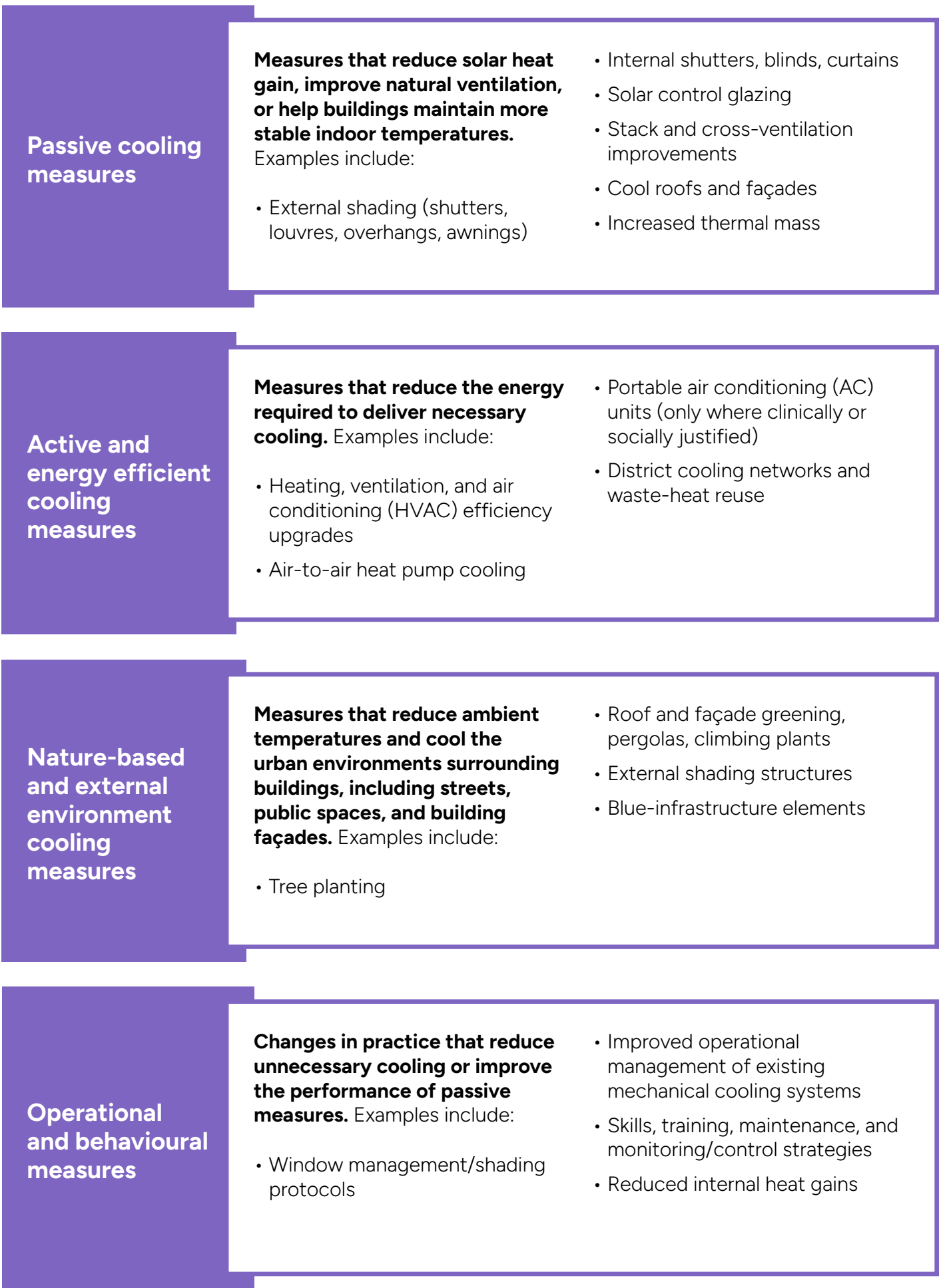
The fundamentals can be grouped into four types of measures:

- Passive cooling measures.
- Active and energy efficient cooling measures.
- Nature-based and external environment cooling measures.
- Operational and behavioural measures.

The CRL options for action relate to the four fundamentals either by:

- Directly enabling them to be implemented (for example B.02 ‘Integrate year-round thermal comfort into retrofit programmes’ drives large-scale deployment of external shading, cool roofs, ventilation improvements, and insulation upgrades).
- Indirectly enabling them to be implemented (for example P.06 ‘Explore financial incentives and align climate finance strategies for passive and sustainable cooling’ helps to unlock funding mechanisms which accelerate the deployment of cooling measures).

Figure 4: The fundamentals of sustainable, efficient and equitable cooling



Cooling Roadmap Options for Action Matrix

Figure 5: The relative impact of each CRL option for action against the project objectives, as well as an indication of the relative effort and cost of implementation. This is to support decision makers to prioritise options and identify ‘quick wins’ within the CRL i.e. options for action which offer meaningful benefits at relatively low cost and low effort and can be implemented sooner. ‘Immediate term’ options for action (taken forward within the next two years) can also help decision-makers prioritise early interventions that help to build momentum and lay the groundwork for longer-term interventions.

Key:

Small reduction in energy cooling demand, low impact on health outcomes, limited impact on cooling poverty, or low level of effort or cost (relative)

Medium reduction in energy cooling demand, medium impact on health outcomes and cooling poverty, or medium level of effort or cost (relative)

Significant reduction in energy cooling demand, high impact on health outcomes, and cooling poverty, or high level of effort or cost (relative)

Options for action	Impact on cooling energy demand	Impact on cooling poverty and inequality	Impact on health outcomes	Effort	Cost
P.01 Clarify indoor maximum temperature guidance for vulnerable settings	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>
P.02 Future-proof overheating assessments in planning	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>
P.03 Heritage-sensitive heat adaptation of priority focus sector buildings	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>
P.04 Strengthen leadership and accountability for heat risk	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>
P.05 Encourage sub-LSOA public realm heat risk studies	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>
P.06 Explore financial incentives and align climate finance strategies for sustainable cooling	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>
B.01 Prioritise overheating assessments for existing focus sector buildings	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>
B.02 Integrate ‘year-round thermal comfort’ into retrofit programmes	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>
B.03 Encourage cross-sector innovation and demonstration for sustainable cooling	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>
B.04 Identify opportunities to integrate cooling into district heat networks	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>
B.05 Improve data on cooling systems, products, and indoor comfort conditions	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>
C.01 Co-design cooling and adaptation with affected communities	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>
C.02 Targeted and timely communication on heat, cooling equity, and passive cooling	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>
C.03 Integrate heat-health and cooling topics into existing training pathways	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>
C.04 Expand sustainable cooling-related skills in the workforce	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>
L.01 Create shaded routes and public spaces in high heat risk areas	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>
L.02 Increase equitable access to cool, healthy and safe spaces	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>
L.03 Expand use of cool and green roofs and façades in priority buildings	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>
L.04 Reduce and reuse waste heat from transport and buildings	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>

Cooling Roadmap for London

Stage 1: Early steps

Prioritised overheating assessments, pilot projects in high heat risk areas and spaces in and around focus sector buildings. These options for action deliver small but structured reductions in cooling energy demand, laying the behavioural and governance foundations needed for later success.

Stage 2: Scaling

Year-round thermal comfort becomes standard in retrofit programmes, cool spaces and shaded walking and wheeling routes expanded, better alignment with climate finance.

Stage 3: Embedding

Most technically and socially feasible passive cooling measures have been deployed in priority focus sector buildings and locations, and the emphasis moves to making these measures work reliably over decades.

Immediate term 2025-2027

Short term 2027-2030

Medium term 2030-2035

Long term 2035-2050+

Policy and Governance: utilising existing policies and governance structures can create an enabling environment for other options for action towards sustainable, efficient and equitable cooling.

P.01 Clarify indoor temperature thresholds for vulnerable buildings and spaces and their occupants. This will help identify areas where cooling measures are most urgent, and support escalation procedures when indoor temperatures become unsafe for certain people, aligning with existing heat-health alerts and emergency preparedness protocols.

P.02 Future-proof overheating in planning. Future reviews of planning and building energy policy could consider how best to incorporate updated weather files and more extreme future scenarios, particularly for buildings in the focus sectors, while continuing to prioritise passive measures and minimising the need for active cooling.

P.03 Heritage-sensitive heat adaptation for focus sector buildings. Heritage policies could be carefully reconsidered to support well-designed, heat-resilient adaptations to existing buildings, alongside energy efficiency and micro-generation measures.

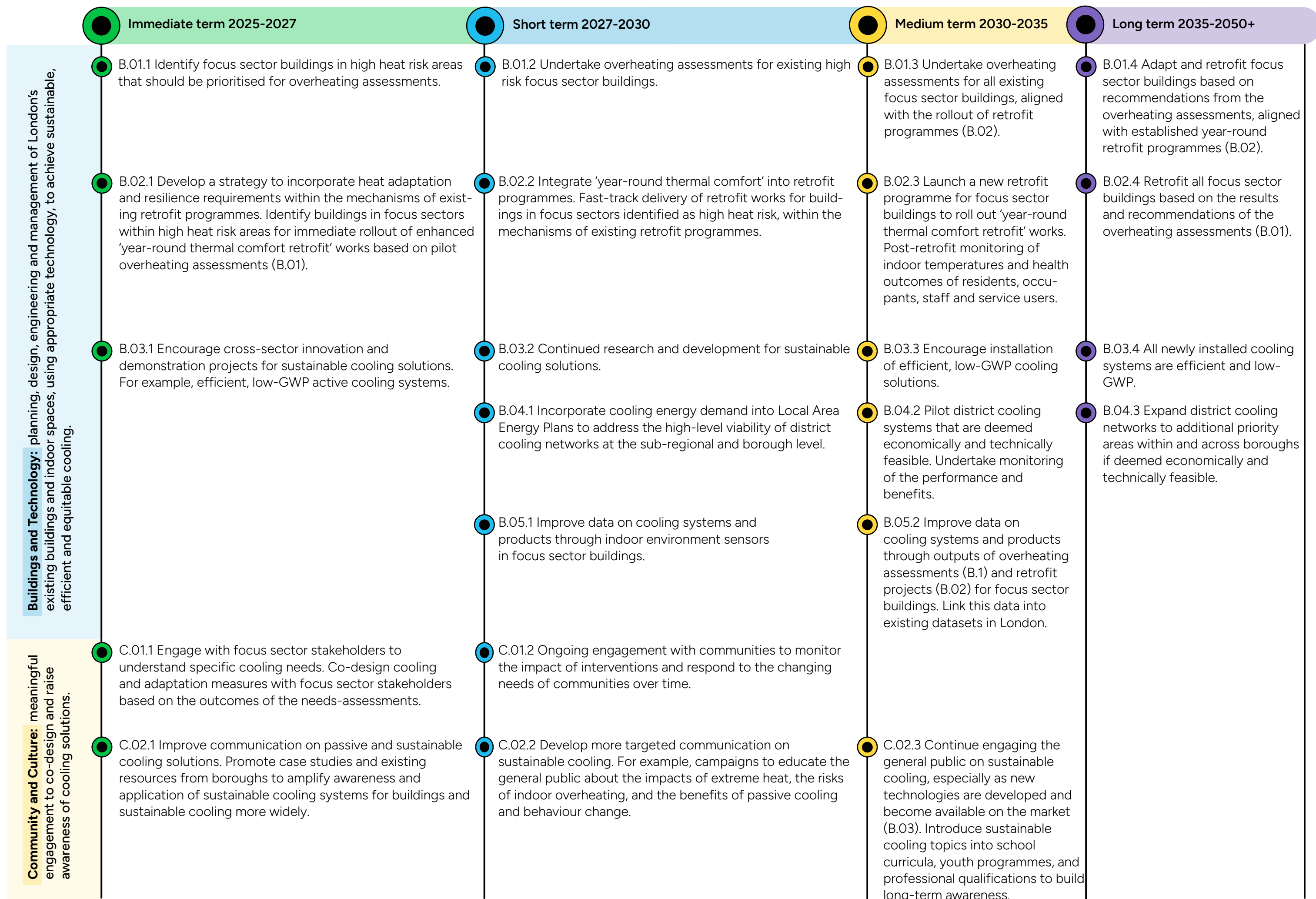
P.04 Strengthen leadership and accountability for heat risk through the development and implementation of the Heat Ready London plan.

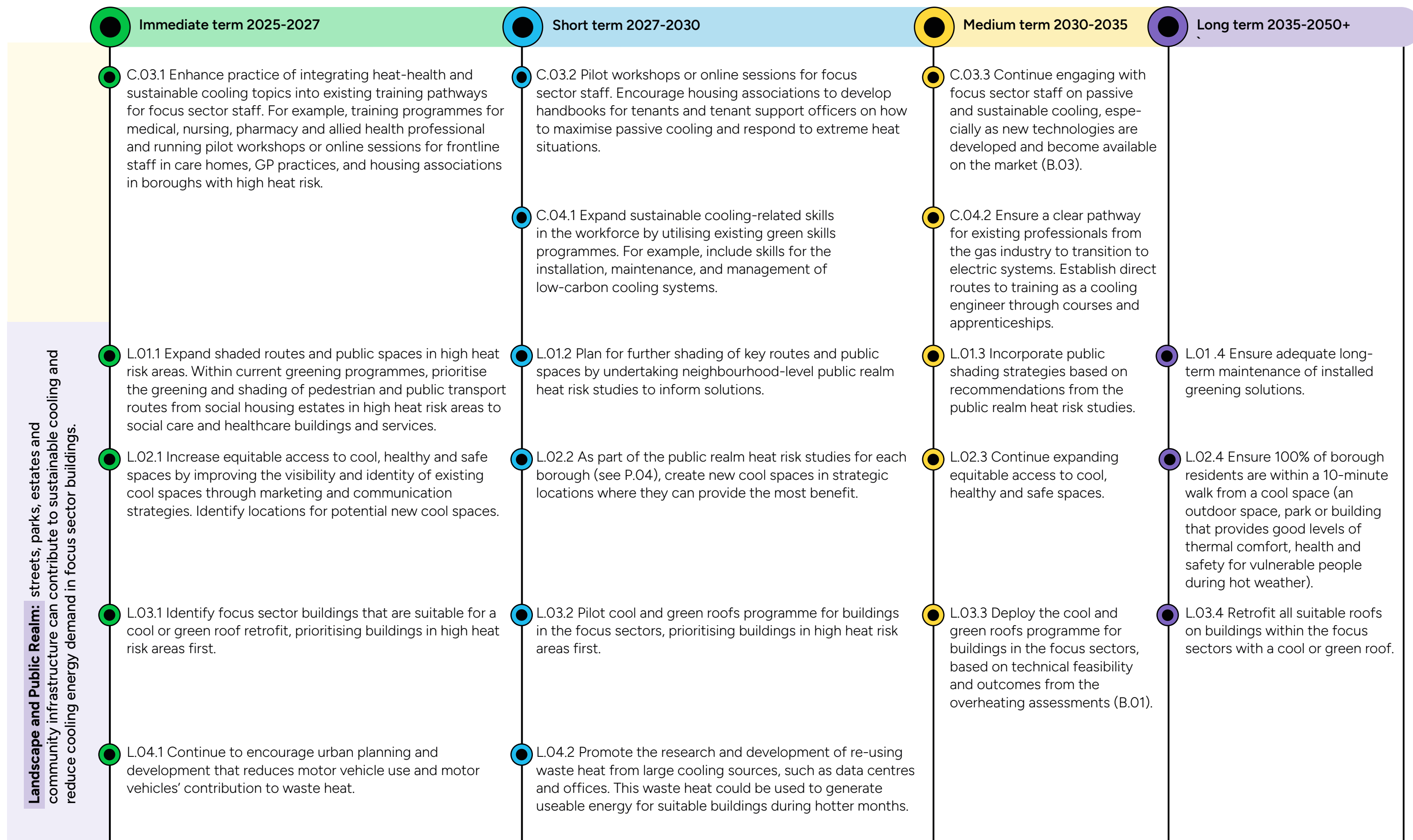
P.05.1 Funding and co-ordination to support public realm heat risk studies in each London borough. Pilot assessments undertaken in some boroughs.

P.05.2 Undertake public realm heat risk assessments in London boroughs, aligned with place-based priorities.

P.05.3 Incorporate borough-level heat adaptation strategies based on recommendations from the public realm heat risk studies.

P.06 Explore financial support and incentives for sustainable cooling as per the published Heat Ready London plan.





7.1 Options for Action

Policy and governance

Although the benefits of passive design and sustainable cooling methods are understood by a growing number of built environment stakeholders, their widespread adoption and implementation is reliant on supportive legislation, policies, and guidance.

Regulatory frameworks play a crucial role in influencing and requiring passive design and sustainable cooling approaches in buildings. While there has been substantial progress in the UK in terms of establishing higher standards of sustainability and climate resilience for new buildings, such as the introduction of Building Regulations Part O³⁸, there is a lack of coherent and mutually reinforcing policies and standards for reducing heat risk and addressing cooling energy requirements in existing buildings. There is also a window of opportunity to align net-zero carbon policies for buildings and urban environments with heat adaptation and resilience policies. This could help avoid maladaptation and missed opportunities to 'do it once, and do it well'.

These challenges are not unique to London. International evidence, most recently highlighted in the UN's Heat Risk Governance Framework and Toolkit³⁹, shows that unclear accountability and fragmented policy responsibilities are common barriers to effective heat risk

management worldwide. Cities globally are experiencing similar difficulties in coordinating across sectors and embedding heat resilience throughout planning, health, housing, and infrastructure systems.

Furthermore, following the Level 4 Heat Alert in 2022, the Mayor of London commissioned the London Climate Resilience Review⁴⁰ to assess the city's preparedness for escalating climate related risks. While the review acknowledged that London is already taking considerable steps to manage heat risk, it also highlighted critical gaps, particularly in policy and governance, which underpin the rationale for the following options for actions.

Therefore, the six 'Policy and Governance' options for action below (P.01 – P.06) provide practical starting points intended to help address these critical and systemic gaps. They relate to 'the enabling environment' for sustainable, efficient and equitable cooling using existing legislation, policies, guidance, and institutional structures.

The intention is that they can be considered and potentially taken forward within the Heat Ready London plan.



Indoor maximum temperature thresholds

Current gaps

There is currently no formal guidance on maximum healthy or safe internal temperature thresholds for buildings in the UK, let alone for buildings and spaces occupied and used by vulnerable people. Whilst there are thresholds used to technically define what constitutes ‘overheating’ in certain rooms within buildings [for example, those set by the Chartered Institution of Building Services Engineers (CIBSE) in Technical Notes TM52 and TM59]⁴¹⁴², upper limits for healthy and safe temperatures are not defined or used to inform building design and operation. Indoor temperatures above 26°C are generally considered ‘uncomfortable’ according to CIBSE, and indoor temperatures above 30°C may pose health risks, especially for elderly or medically vulnerable individuals. The UK Health Security Agency (UKHSA) has explored the need for maximum indoor temperature thresholds and encourages moving vulnerable residents to cooler spaces where temps exceed 26°C⁴³. However, there is no statutory requirement for monitoring or reducing indoor heat risk in existing buildings.

Option for action

→ P.01 Clarify indoor maximum temperature guidance for vulnerable settings (Immediate Term 2026-2027)

National, London-wide, and sector-level processes could review the evidence and consider non-statutory guidance and/or operational protocols for indoor maximum temperatures, particularly in focus sector buildings where some of London’s most vulnerable people reside. More focused guidance could help identify buildings and rooms where measures are most urgent, and support escalation procedures when indoor temperatures become unsafe for certain people. This should align with existing heat-health alerts and emergency preparedness protocols.

Outcomes

Clarifying the range of internal temperatures, and the maximum temperatures, that can impact thermal comfort, health, and safety of different groups of people would make it easier to identify buildings and spaces that require intervention. It would also inform overheating assessments and retrofit programmes to ensure high heat risk buildings stay within comfortable, healthy, and safe temperature limits all year round.

Strategic objectives



Future-proof overheating assessments in planning

Current gaps

Future reviews of planning and building energy policy could consider how best to incorporate updated weather files and emerging future scenarios, particularly for buildings in the focus sectors.

Existing regional policy requires new developments to reduce the potential for overheating and reliance on active cooling by following the cooling hierarchy. The use of active cooling is not desirable due to its large energy use and applications that propose active cooling are generally not supported, especially for residential developments. Currently, new developments must undertake dynamic thermal modelling and assessment to demonstrate whether active cooling is necessary once all passive measures have been considered and exhausted. If so, then a proposed development with active cooling may be accepted. The overheating assessment must include simulations that are required to meet overheating criteria based on 2020 weather files only, so the decision is based on current, not future, heat risk.

However, due to the acceleration of climate change and the UHI effect, heatwaves experienced in London in recent years have already exceeded the heat intensity assumed in those files, which now underrepresent current overheating and heat risks. The latest CIBSE weather files (published 2025)⁴⁴ may be more representative for assessing overheating risk in new developments as they incorporate updated climate baselines and UKCP18 climate projections, reflecting the substantial warming already observed in recent UK summers.

Option for action

→ P.02 Future-proof overheating assessments in planning (Short Term 2027-2030)

For new developments within the focus sectors, the use of the 2050 and 2080 weather files would be prudent in overheating assessments. If assessments indicate active cooling is necessary for developments in these sectors, it could be seen

more favourably due to the presence of highly vulnerable people within these buildings, either as residents, service users or staff. However, appropriate passive cooling and energy efficiency measures should be incorporated first to reduce the cooling energy demand, as per current policy, but greater leniency could be made for these settings specifically.

This could be considered at a national policy level to ensure alignment across the country.

Outcomes

By aligning current and evolving planning policy with current and evolving climate realities, London can future-proof focus sector buildings against overheating and protect vulnerable building occupants and users.

Strategic objectives



Heritage-sensitive adaptation of buildings

Current gaps

Historical buildings are an important part of London’s architectural and cultural identity, contributing to the city’s character, heritage, and sense of place. Some heritage conservation policies can restrict external and internal modifications that are essential to adapt buildings to increasing temperatures and make them fit-for-purpose. This can hinder efforts to retrofit priority focus sector buildings that have heritage value, even if they are occupied or used by heat-vulnerable people.

Historic England has published new guidance on adapting historic buildings for energy and carbon efficiency⁴⁵, which includes the use of passive cooling measures. However, the guidance can still be restrictive in practice. For example, measures such as external shading devices, green façades and green roofs, may be discouraged or require complex approvals due to their visual impact on historic façades or streetscapes. This can delay or prevent urgent retrofits in heat-exposed buildings and neighbourhoods.

Option for action

→ P.03 Heritage-sensitive heat adaptation of priority focus sector buildings (Short Term 2027-2030)

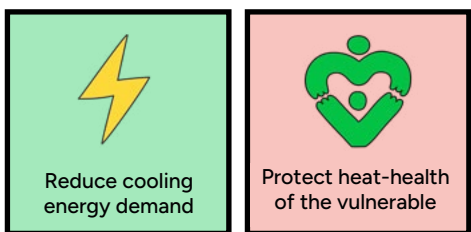
Heritage policies could be carefully reconsidered to support well-designed and heat-resilient adaptations to existing buildings, alongside energy efficiency and micro-generation measures. In addition, existing processes for planning approval and consent could be fast-tracked for priority (high heat risk) buildings in focus sectors.

Local authorities could also create and publish their own adaptation guidance specific to the heritage-sensitive buildings in their borough to encourage the retrofit of passive cooling solutions. A recent example of this is Westminster City Council’s ‘Weather-ready homes’⁴⁶.

Outcomes

Heritage guidance and planning processes are aligned to support, rather than hinder, climate-resilient retrofit, especially for focus sector buildings. This could protect the heat-health and safety of vulnerable building occupants and users and to ensure year-round thermal comfort, all while maintaining the integrity of heritage assets.

Strategic objectives



Strengthen leadership and accountability for heat risk

Current gaps

Leadership and ownership of tackling indoor heat risk in London is currently unclear, leaving responsibilities fragmented across multiple organisations and public bodies. Without a designated entity coordinating practical action, heat risk often falls between existing policy areas and is treated as a secondary issue where responsibility falls on by sectors or organisations.

Furthermore, stakeholder organisations representing the focus sectors at the national, regional, sub-regional, and borough levels have begun to make climate action a priority issue, to varying degrees. However, there is still a large gap in terms of these sectors focusing on heat risk and heat resilience specifically, especially within the context of existing facilities in London.

Option for action

→ P.04 Strengthen leadership and accountability for heat risk

→ P.04.1 Strengthen leadership and accountability for heat risk through the development and implementation of the Heat Ready London plan. (Immediate Term 2026-2027)

→ P.04.2 Develop focus sector-specific heat resilience working arrangements using existing boards and networks to make sustainable cooling a priority action (Immediate Term 2026-2027)

→ P.04.3 Enable leadership in heat risk and adaptation through the capacity building of climate teams within London’s boroughs (Short Term 2027-2030)

These options for action focus on developing and strengthening existing focus sector collaboration on heat risk, adaptation, and resilience using existing boards and networks, rather than proposing new formal structures. There is also an emphasis on leadership, accountability, and coordination for managing heat risk in London that are more clearly embedded within existing governance

arrangements at city and borough level. Clarity is required on the roles and responsibilities, as identified in the London Climate Resilience Review.

A London-wide heat-resilience working group could be formed as part of existing health or climate-based groups within the focus sectors. The heat-resilience working group could act as a trusted hub where housing associations, healthcare and social care providers, technical experts, residents, and community groups share experiences of overheating and practical guidance on passive-first solutions. It could also help connect funding to high-priority settings, accelerating the uptake of sustainable cooling strategies.

The London Climate Ready Partnership (LCRP) has established a heat risk sub-group focused on London’s resilience to heatwaves and overheating. The proposed working groups for each focus sector could collaborate closely with and build on the existing work of the LCRP. London Councils has also established a ‘Resilient and Green’ Working Group. Existing groups, such as the ‘Homes for Londoners Board’, the ‘London Housing Panel’, and the ‘Warmer Homes London’ programme, provide strong foundations for establishing or supporting a heat-resilience working group focused on the social housing sector. These platforms already bring together key stakeholders, including housing associations, local authorities, tenant representatives, and retrofit delivery partners.

A heat-resilience working group could also be combined for social care and healthcare sectors. London’s Integrated Care Boards (ICBs) offer an ideal foundation for establishing a joint heat-resilience working group for the social care and healthcare sectors. These systems are already designed to bring together NHS organisations, local authorities, and voluntary and community sector partners to improve population health and reduce inequalities.

Detailed plans for any such arrangements are expected to sit within the Heat Ready London plan.

Outcomes

Strengthening heat leadership in London would create a dedicated focal point for the coordination of city-wide heat adaptation and resilience efforts, including the recommendations set out within this CRL.

For social housing, embedding a working group within or alongside existing structures could enable strategic alignment with existing retrofit priorities, ensure coordination with funding streams, and facilitate direct engagement with those responsible for delivering social housing improvements.

For social care and healthcare, embedding a working group within existing structures could ensure that heat-health risks are addressed holistically across care pathways, estates planning, and service delivery. It could also enable coordinated action on sustainable cooling measures in care homes, community health settings, hospitals, and GP surgeries. By leveraging the ICBs’ existing governance and cross-sector reach, the working group could align heat resilience with broader health equity and climate action goals.

Strategic objectives



Public realm heat risk studies

Current gaps

Many London boroughs are now using the GLA Climate Risk Map⁴⁷ as a useful starting point for addressing heat risk; this is a positive stage of awareness and action. However, more detailed analysis and understanding of the spatial distribution of heat risk (both heat exposure and heat vulnerability) below the Lower Super Output Area (LSOA) level could inform practical and meaningful planning, design, retrofit, and development measures.

Option for action

- **P.05 Encourage sub-LSOA public realm heat risk studies**
- **P.05.1 Secure funding for pilot public realm heat risk studies for London boroughs. Pilot assessments undertaken in some boroughs (Immediate Term 2026-2027)**
- **P.05.2 Conduct public realm heat risk assessments in London Boroughs, aligned with place-based priorities (Short Term 2027-2030)**
- **P.05.3 Incorporate borough-level adaptation strategies based on recommendations from the public realm heat risk studies (refer to L.01, L.02, L.03 and L.04) (Medium Term 2030-2035)**

These options focus on encouraging more neighbourhood-level (that is sub- or cross-LSOA) outdoor heat risk assessments. These assessments would collect and analyse data relating to heat exposure, heat vulnerability, and microclimate to inform adaptation and resilience measures linked to existing place-based work (for example town centre strategies, local area energy plans (LAEPs), and regeneration schemes). This also includes consideration of funding and deploying more temperature sensors across London, with an emphasis on utilising the recorded data in ways which provide insights to local authority teams and communities to inform sustainable cooling measures.

Whilst the GLA Climate Risk Maps provide data on ambient and surface temperatures, on the ground measurements of surface and ambient temperature data could help get a more accurate assessment of safe and unsafe heat exposure areas.

Outcomes

More detailed analysis and understanding of the spatial distribution of heat risk, both heat exposure and heat vulnerability, below the LSOA level, including the deployment of heat sensors, could inform practical and meaningful planning, design, retrofit, and development measures. By collecting and analysing granular data on urban heat exposure, vulnerability, and microclimatic conditions, boroughs can identify specific areas, streets, and communities most at risk. This could enable targeted measures for the public spaces, social infrastructure, and green infrastructure around buildings in the focus sectors.

Existing public realm studies include:

- Holborn Liveable Neighbourhood Heat Resilience Study⁴⁸
- Westminster Cool Neighbourhoods Strategy⁴⁹
- TreesAI (Trees As Infrastructure) Croydon (Dark Matter Labs)⁵⁰

Strategic objectives



Case study: Holborn Liveable Neighbourhood

The Holborn Liveable Neighbourhood Heat Resilience Study⁵¹ is an innovative research project commissioned by Camden Council in 2024. The aim of the project was to analyse the growing risks of hotter weather for Holborn’s public realm and identify a suite of targeted adaptation measures that can help address them.

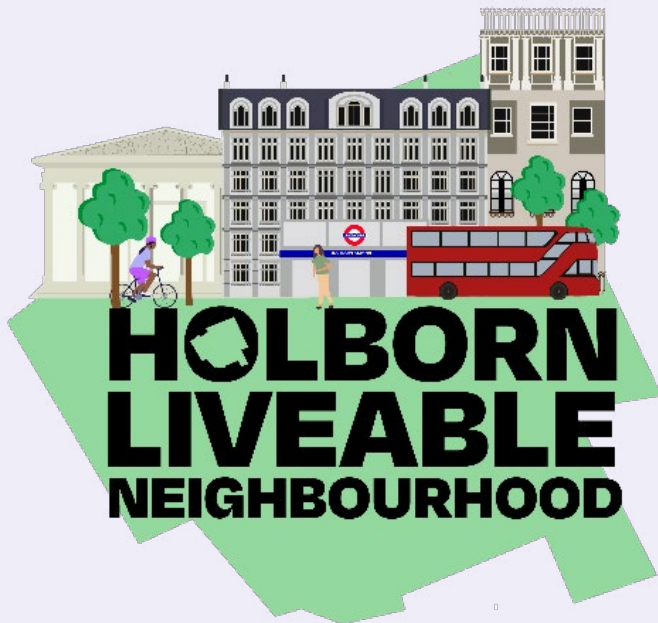
The study forms part of the wider Holborn Liveable Neighbourhood (HLN) project, a transformative street and public realm programme in the heart of London. HLN aims to promote healthier lifestyles, encourage active and sustainable travel, and improve safety, air quality, and climate resilience in the area.

Holborn’s public realm currently offers limited protection from extreme heat, with minimal shading and few spaces that provide relief from high temperatures. This means many streets and public areas are uncomfortable and potentially unsafe during hot weather, particularly for vulnerable people. The study identified targeted areas within Holborn which would benefit most from heat adaptation measures to align with the five HLN project outcomes: Safe, Efficient, Green, Active, and Connected.

Microclimate modelling and analysis across the HLN area informed a detailed map of ‘hot spots’ with high heat exposure, accompanied by a heat-vulnerability assessment. One of the three priority hot spots was the communal space of a social housing estate, another priority hot spot was the footway of a busy street in close proximity to areas of social housing and a hospital.

An overarching heat resilience strategy for the HLN area was developed, including a high-level shade and cooling masterplan that proposed suitable cooling and adaptation measures for the identified hot spots.

Whilst the study focused on the specific context of Holborn in the London Borough of Camden, it has transferability and replicability for other London Boroughs to design cooler, healthier, and safer public spaces for everyone in London, and for protecting people, communities and neighbourhoods from the impacts of extreme heat.



Financial support and incentives

Current gaps

Creating financial incentives for passive cooling measures in London is a critical step toward accelerating heat adaptation and resilience, especially for buildings in the focus sectors which are occupied and used by heat-vulnerable people.

However, uptake for passive cooling measures remains limited for several reasons, including relatively higher upfront costs (perceived and actual) and a lack of targeted financial support.

Option for action

→ **P.06 Explore financial incentives and align climate finance strategies for passive and sustainable cooling**

→ **P.06.1 Explore financial support and incentives for passive and sustainable cooling as per the published the Heat Ready London plan. (Immediate Term 2026-2027)**

→ **P.06.2 Align climate finance strategies with heat adaptation and cooling measures as per the published the Heat Ready London plan. (Immediate Term 2026-2027)**

Financial support and incentive models could be explored (for example, tax reliefs, grants, concessional finance) that could make passive and sustainable cooling measures more attractive, alongside energy efficiency and low carbon retrofit measures in focus sector buildings. For example, a tax rebate programme could allow refunds to be claimed on declared adaptation and resilience measures, provided applicants submit proof of eligible improvements from a pre-approved list.

Heat adaptation and sustainable cooling measures could also be more explicitly considered within broader climate finance strategies and investment frameworks, including work on co-investment models with private capital.

London is already exploring co-designed investment models that involve housing associations, NHS

Trusts, and care providers in project development. These existing processes could be used to understand what measures may be feasible for addressing overheating risk in the focus sectors.

For any future climate finance strategies or investment frameworks, existing work could inform the allocation of funding, for example, using the GLA Climate Risk Map, Properties Vulnerable to Overheating Report⁵², Roofs Designed to Cool report⁵³, and data from proposed new overheating assessments (see B.01) and public realm heat risk studies (see P.05).

The detailed design of any such mechanisms is expected to sit within the Heat Ready London plan.

Outcomes

This approach could make passive cooling retrofits more financially accessible and encourage early adoption rather than resulting in a ‘straight to air conditioning’ scenario. It could also help attract private capital to match public funding, increase investor confidence, and accelerate delivery of impactful heat adaptation and cooling projects across London’s high heat risk sectors.

Strategic objectives



Wider impacts and co-benefits of P.01-P.06

If delivered, the options for actions could bring several wider impacts and co-benefits that extend beyond reducing cooling energy demand, addressing cooling poverty and inequity, and protecting the health of heat-vulnerable people:

- Enhance the longevity and value of historic buildings by ensuring thermal comfort helps make heritage assets more viable for continued use, while reducing the risk of disrepair, vacancy, or underuse. In doing so, historic buildings can remain active and accessible, supporting local identity and a sense of place.
- Promote innovative design approaches and technologies that balance heat adaptation and resilience with heritage protection, setting precedents for other cities.
- Position boroughs with robust heat risk data and policies to secure regional, national, and international funding.
- Drive demand for skilled labour in retrofit, construction, green infrastructure, and climate services, supporting London's green economy.

Options for Action

Buildings and technology

The following five 'Buildings and Technology' options for action (B.01-B.05) relate to the planning, design, engineering, and management of London's existing buildings and indoor spaces, and using appropriate technology, to achieve sustainable, efficient and equitable cooling.

These options for action assume a 'passive-first' approach to cooling measures, whereby improving external shading, building fabric efficiency, cross-ventilation, cool surfaces, and green infrastructure are all considered before proposing active cooling. Although the focus is on existing buildings, proposed options can be applied to both existing and new buildings.



Overheating assessments

Current gaps

Overheating is both a city-wide issue and a hyper-localised issue, varying not just between urban neighbourhoods and buildings within a neighbourhood, but often between individual floors and rooms within a building. Improving the internal thermal comfort of existing buildings at scale is challenging as building regulations which target overheating (Approved Document Part O) apply to new residential buildings only.

Option for action

→ **B.01 Prioritised overheating assessments for existing focus sector buildings**

→ **B.01.1 Identify focus sector buildings in high heat risk areas that should be prioritised for overheating assessments (Immediate Term 2026-2027)**

→ **B.01.2 Undertake overheating assessments for existing high risk focus sector buildings (Short Term 2027-2030)**

→ **B.01.3 Undertake overheating assessments for all existing focus sector buildings, aligned with the rollout of retrofit programmes (refer to B.02) (Medium Term 2030-2035)**

→ **B.01.4 Adapt and retrofit focus sector buildings based on recommendations from the overheating assessments, aligned with established retrofit programmes (refer to B.02) (Long Term 2035-2050)**

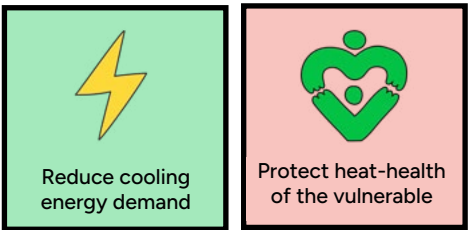
These options focus on prioritising focus sector buildings in high heat risk areas for overheating assessments under current and future weather scenarios. This is to ensure that the limited retrofit resources can be directed where they will protect the most vulnerable people and deliver the greatest health and equity benefits. These assessments would inform the most effective and cost-efficient sustainable cooling solutions for each building. Existing work, including the GLA Climate Risk Map, the GLA commissioned Properties Vulnerable to

Heat Risk, Roofs Design to Cool, and Care Home Overheating Audit Pilot Project⁵⁴ reports could be used as a starting point to identify the priority buildings.

Outcomes

Deploying overheating assessments would help identify which buildings and spaces are most at risk of unsafe indoor temperatures, providing an evidence base for targeted measures. The assessment results and solutions could also feed into funded heat adaptation or 'year round thermal comfort' retrofit programmes for buildings and spaces which need them most (see B.02). These assessments will also ensure that passive cooling strategies, such as shading, ventilation, and reflective surfaces, are prioritised before resorting to active cooling systems. This could have the potential to lower overall cooling energy demand and protect the health and wellbeing of heat-vulnerable populations in the focus sectors.

Strategic objectives



'Year-round thermal comfort' retrofit

Current gaps

There are an increasing number of retrofit programmes in the UK and London targeting energy efficiency, achieving net-zero carbon goals, tackling fuel poverty, and keeping buildings warm in winter. These programmes present a valuable opportunity to integrate co-beneficial measures that also keep buildings cool in summer to ensure year-round thermal comfort, address both fuel poverty and potential cooling poverty, and avoid costly rework in the near future.

Option for action

→ **B.02 Integrate 'year-round thermal comfort' into retrofit programmes**

→ **B.02.1 Develop a strategy to incorporate heat adaptation within the mechanisms of existing retrofit programmes and identify priority focus sector buildings within high heat risk areas for immediate rollout of 'year-round thermal comfort retrofit' works based on pilot overheating assessments (refer to B.01) (Immediate Term 2026-2027)**

→ **B.02.2 Integrate 'year-round thermal comfort' into retrofit programmes. Fast-track delivery of retrofit works for priority buildings in focus sectors identified as high heat risk, within the mechanisms of existing retrofit programmes (Short Term 2027-2030)**

→ **B.02.3 Launch a new, focused retrofit programme for focus sector buildings to rollout 'year-round thermal comfort retrofit' works, with post-retrofit monitoring of indoor temperatures and health outcomes of residents, occupants, staff and service users (Medium Term 2030-2035)**

→ **B.02.4 Retrofit all focus sector buildings based on the results and recommendations of the overheating assessments (refer to B.01) (Long Term 2035-2050+)**

A fast-track pipeline for 'year-round thermal comfort retrofits' could be developed for priority buildings in the focus sectors to ensure healthy living and caring environments for London's most vulnerable people. Existing work to identify heat risk, as set out in B.01, as well as outcomes from the proposed new overheating assessments could inform priority buildings to target for the retrofit programme.

Examples of existing relevant programmes include:

- Warmer Homes London Programme⁵⁵
- Retrofit Accelerator (for Homes, Workplaces, and Social Housing - programmes now closed)⁵⁶
- Zero Carbon Accelerator⁵⁷
- Future Neighbourhoods 2030⁵⁸
- Warm Homes: Social Housing Fund⁵⁹
- The New Decent Homes Standard⁶⁰

Outcomes

By incorporating measures to mitigate overheating within existing retrofit efforts now, resource and impact could be maximised to improve health outcomes and build long-term climate resilience.

Social housing

There is a considerable and justified focus on warm homes and social housing amongst current London-wide retrofit programmes. More localised retrofit programmes are starting to include overheating and heat resilience requirements too, such as Westminster City Council's Queens Park Avenues Project and Camden's Tybalds Estate Regeneration Project. However, the size of the opportunity to scale up this type of work is substantial.

It is important that retrofit measures are co-designed with residents to ensure they meet the needs of those households, reduce unnecessary costs, and ensure healthier homes (refer to C.01).

Social care

Current retrofit programmes in London focus mainly on homes and workplaces, with some including healthcare settings. These programmes should be expanded to other critical settings, such as social care (both public and private sector), and to explicitly include overheating and heat risk.

The Mayor of London’s ‘Care Home Overheating Audit Pilot Project’, and the comprehensive research evidence produced through the ClimaCare project, lay the groundwork for heat adaptation and resilience planning in care settings and could be used to inform investment within the expanded retrofit programmes⁶¹.

Healthcare

It may be possible for some healthcare (and social care) buildings to be retrofitted without relying on Government-led programmes, especially those located in lower heat risk areas but still experience overheating issues. To achieve this, funding for passive and sustainable cooling initiatives could be allocated within local NHS budgets and incentivised through the Care Quality Commission (CQC) assessment framework⁶².

Investment should be diverted away from short-term, energy inefficient, and high-carbon active cooling solutions to retrofits that deliver long-term passive and sustainable cooling. For example, investment in heat adaptation and resilience within the NHS has typically prioritised temporary solutions during extreme heat events, such as the deployment of portable cooling systems. This may provide some short-term relief from the heat for patients, staff and visitors, but does not promote long-term resilience for future heat events. Portable cooling units are generally less efficient than fixed cooling systems, have higher running costs, are noisier, and cause issues with space and exhaust air handling⁶³.

Strategic objectives



Case study: Queen’s Park Avenue Healthy Homes

The Queen’s Park Avenues Healthy Homes (QPAHH) project in Westminster is an emerging example of a people-centred, holistic retrofit programme that places overheating risk on equal emphasis with other retrofit outcomes such as energy efficiency, renewable energy, damp, mould and air quality. The estate operates within a complex context: a dense residential neighbourhood and a conservation area designation that requires sensitive and carefully considered design interventions.

Recognising that traditional energy-efficiency retrofits alone can unintentionally exacerbate overheating, the project has undertaken overheating assessments on a sample of the homes to understand how a range of design variables influence indoor temperatures across multiple building types and occupancy scenarios. This modelling underpins strategic decisions on retrofit approaches, ensuring that measures to reduce heat loss in winter do not inadvertently trap heat in summer. In this way, the QPAHH project demonstrates a shift toward holistic, year-round thermal comfort, a key principle in resilient retrofit practice.

The project is part of the borough’s broader ambition to reduce health inequalities, improve housing quality, and become a net-zero city by 2040. Importantly, QPAHH is being co-designed with residents, including owner-occupiers, council tenants, housing association tenants, and private renters. This collaborative process ensures that retrofit proposals reflect local lived experience, practical constraints, and residents’ priorities, particularly around comfort, affordability, and day-to-day usability.

QPAHH provides a replicable model for other London boroughs: a strategic, evidence-based retrofit programme that integrates overheating risk from the outset, engages communities meaningfully, and aligns heritage, health, and climate objectives.



Innovations in sustainable cooling

Current gaps

The transition to sustainable cooling in London has an opportunity to ‘leapfrog’ standard inefficient, wasteful, and high-carbon active cooling systems which exacerbate existing heat-related issues. There is potential scope for a market and product pipeline to be developed for energy and resource-efficient, active cooling solutions for buildings.

Option for action

→ **B.03 Encourage cross-sector innovation and demonstration for sustainable cooling**

→ **B.03.1 Encourage cross-sector innovation and demonstration projects for sustainable cooling (Immediate Term 2026-2027)**

→ **B.03.2 Continued research and development of efficient, low-global warming potential (GWP) cooling solutions (Short Term 2027-2030)**

→ **B.03.3 Encouraged installation of efficient, low-GWP cooling solutions (Medium Term 2030-2035)**

→ **B.03.4 All newly installed cooling systems are efficient and low-GWP (Long Term 2035-2050+)**

These options focus on building multi-stakeholder partnerships to accelerate innovation, testing, and demonstration of sustainable cooling solutions in real buildings, with a strong emphasis on equity and practical applicability.

Research and development could support passive technologies, such as high-mass, high-insulation and phase-change materials, as well more sustainable active cooling technologies, such as low-global warming potential (GWP) cooling systems and demand/control sensors to optimise efficiency.

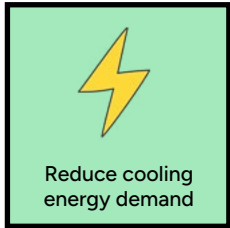
To accelerate the development and deployment of sustainable and equitable cooling measures in London, it is essential to build multi-stakeholder, cross-sector partnerships. These partnerships should bring together actors from local government,

housing associations, social care, healthcare, education, community organisations, and the private sector, including technology developers, retrofit contractors, and financial institutions. By working collaboratively, these stakeholders can pool expertise, share data, and co-design solutions that are context-specific, scalable, and inclusive.

Outcomes

Such partnerships could unlock opportunities for innovation, research, and financing. Academic and research institutions could lead on modelling, monitoring, and evaluating cooling measures, while industry partners could pilot innovative technologies and materials. Crucially, involving community organisations ensures that solutions are responsive to local needs and promote heat-health equity. Together, these partnerships can accelerate innovations for London’s approach to heat resilience, making cooling accessible, affordable, and efficient for deployment in the focus sectors.

Strategic objectives



District cooling

Current gaps

District cooling is an energy efficient way of providing comfortable, healthy, and safe internal temperatures for multiple buildings, without installing active cooling systems in individual buildings. District cooling systems have traditionally been used in cities with hotter climates than London but are increasingly being utilised in European cities. District cooling centralises the production and distribution of cooling energy, with benefits, such as reducing maintenance for individual buildings and systems, reducing the need for rooftop plant equipment, reducing local noise and waste-heat issues, and providing an overall improvement in cooling energy efficiency.

District heating and heat networks are an established technology and policy focus in London, and the UK, and their expansion is vital to meeting net-zero targets. However, greater consideration is needed towards climate mitigation and adaptation by integrating district cooling networks in parallel to the development of district heat networks.

There are notable examples of cooling networks in London, for example, the ‘Kings Cross District Cooling System’, which serves new residential and office buildings in the area. Yet, cooling networks that do exist largely focus on providing cooling to high-end housing, offices, computer servers, and data centres. A more equitable distribution of district cooling networks is required, especially in high heat risk areas and for focus sector buildings, as they are used by some of London’s most heat-vulnerable people.

The existing Department for Energy Security and Net Zero (DESNZ) Heat Networks Delivery Unit⁶⁴ covers both heat and cooling networks, but cooling provision is not currently mandatory in proposals for new networks. It is noted that integrating district cooling into existing, densely built environments, especially areas of older buildings and mixed-uses, can be technically difficult and costly. The initial investment for district cooling infrastructure, planning, and installation is also substantial. Therefore, district cooling represents a huge

potential opportunity for sustainable cooling in London but requires further technical and economic feasibility considerations.

Option for action

→ **B.04 Identify opportunities to integrate cooling into district heat networks**

→ **B.04.1 Incorporate cooling energy demand to Local Area Energy Plans (LAEPs) to address the high-level viability of district cooling networks at the sub-regional and borough level (Short Term 2027-2030)**

→ **B.04.2 Pilot district cooling systems that are deemed economically and technically feasible. Undertake monitoring of the performance and benefits (Medium Term 2030-2035)**

→ **B.04.3 Expand district cooling networks to additional priority areas within and across boroughs if deemed economically and technically feasible (Long Term 2035-2050+)**

These options do not assume that district cooling networks will be widely deployed but suggests that strategic exploration is needed to understand in which locations, if any, networked district cooling could outperform individual building systems in terms of efficiency, cost, refrigerant management, and equity.

All forthcoming LAEPs could include a chapter on cooling energy demand and sustainable cooling energy provision and address the high-level viability of district cooling networks at the sub-regional and borough-level. This could address how opportunities for cooling supply can be utilised alongside opportunities for cooling demand. For example, whether focus sector buildings are within sufficient proximity to an appropriate cooling source to enable a district or networked solution.

Social housing

Whilst passive cooling should be maximised for residential properties, high-density social housing could also benefit from district cooling networks, especially in areas of high heat risk and for buildings assessed to be at high risk of overheating. As part of existing heat network policy, many planned heat networks may also have cooling capabilities, which could be explored further. The lead time for installation of heating or cooling networks is considerable, but may result in cooling networks coming into operation when they are most needed in London (for example in 25+ years).

Healthcare

The healthcare sector is likely the most relevant for district cooling given the high cooling energy demands and high density of healthcare buildings, particularly hospitals. A grant system could be set up to identify opportunities to replace outdated cooling and ventilation equipment with district cooling systems as part of hospital retrofit works.

An audit could be undertaken to identify areas within London, and within the NHS London Estate, where district cooling could be utilised (for example, planned healthcare hubs and future healthcare developments).

Strategic objectives



Reduce cooling energy demand



Address cooling poverty & inequity



Protect heat-health of the vulnerable

Cooling data

Current gaps

There is no centralised, London-wide, up-to-date register of buildings with active cooling, nor is there data regarding the amount of energy required to cool them. However, there are examples of successful inventories which could be mirrored for cooling energy demand and consumption in London, such as the National Atmospheric Emissions Inventory (NAEI).

The NAEI was developed as part of reporting requirements associated with the Environment Act 1995. It collates data from annual reports submitted by organisations about their air pollutant emission releases and compliance with regulation. If similar reporting requirements were mandated for cooling systems and products, it could significantly improve our understanding of buildings and areas with high cooling energy demand and inform decision making. The proposed overheating assessments (see B.01) could help build this database for the focus sectors. The cooling data requirements could also include ‘f-gas’ data reporting requirements.

Option for action

→ B.05 Improve data on cooling systems, products, and indoor comfort conditions

→ B.05.1 Improve data on cooling systems, products and indoor comfort conditions through use of indoor environment sensors in focus sector buildings (Short Term 2027-2030)

→ B.05.2 Improve data on cooling systems, products through the overheating assessments (refer to B.1) and retrofit projects (refer to B.02) of focus sector buildings and link this into existing cooling data sets in London (Medium Term 2030-2035)

Outcomes

These options focus on gradually improving data on cooling systems and indoor thermal comfort conditions, starting with focus sector buildings in high heat risk areas and aligning with existing data

systems and privacy requirements.

The London Building Stock Model (LBSM) already provides data on energy performance, insulation, heating systems, and building fabric for domestic and non-domestic buildings in London. This model could be extended to include cooling-related variables, such as indoor temperature monitoring, cooling system type and efficiency, f-gases, passive cooling features, and overheating risk. The LBSM could also integrate relevant and updated data from the London Solar Opportunity Map⁶⁵, such as surfaces receiving high amounts of solar radiation levels and areas of overshadowing.

The NHS SHAPE Atlas also collates and displays a wide variety of data about the NHS Trusts and Integrated Care Systems (ICSs) in London. It could be developed to include additional data about cooling energy demand and use for social care and healthcare buildings in London.

The following could be carried out to improve the quantity and quality of cooling data:

- Install indoor environment sensors in high heat risk buildings in the focus sectors.
- Expand the LBSM to incorporate more advanced cooling data.
- Consider developing the NHS Shape Atlas to collate and display additional data on heat risk and cooling energy demand/use in social care and healthcare buildings.
- Incentivise the collation and sharing of cooling data by linking it to ‘year-round thermal comfort retrofit’ funding streams (B.02).

Strategic objectives



Reduce cooling energy demand

Wider impacts and co-benefits of B.01-B.05

If delivered, the options for actions could bring several wider impacts and co-benefits that extend beyond reducing cooling energy demand, addressing cooling poverty and inequity, and protecting the health of heat-vulnerable people:

- Boosts green jobs and skills through the required training, assessments, design, installation, maintenance, and consultancy of expanding existing retrofit programmes to encompass 'year-round thermal comfort retrofit'.
- Higher asset value for buildings that demonstrate thermal comfort and climate resilience.
- Supports net-zero goals by encouraging the development of high-efficiency cooling systems and reducing cooling energy demand.
- Reduces long-term public spending on social housing, social care and healthcare by improving health outcomes of residents, occupants, patients, staff and service users, and by addressing overheating risks early and preventing emergency responses, critical site incidents, and costly retrofits later.
- Signifies London's role as a leader in developing innovative new cooling technologies, as well as its commitment to deploying tried and tested technologies.
- Improves urban air quality by reducing waste heat from inefficient and decentralised cooling systems.
- Lowers long-term energy costs for building operators and public services through more efficient cooling distribution.
- Improves refrigerant management and safety standards, helping to phase down high-GWP f-gases and prevent leaks.

Options for Action

Communities and culture

Achieving sustainable cooling in London requires more than just policies and technical design and engineering solutions, it demands meaningful community engagement, greater public awareness, training, and co-design. These elements will ensure that the reasons for passive and sustainable cooling strategies are well understood, and that the strategies themselves are as effective, equitable, inclusive, and responsive to local needs as possible.

Engaging communities, whether within a neighbourhood or within the social care or healthcare workplace, helps to identify heat-vulnerable people, build trust, and foster behavioural change. Raising public awareness empowers residents, occupants, patients, staff and service users to act and advocate for passive and sustainable cooling improvements in their neighbourhoods, buildings and places of work. It can also ensure that occupants know how to manage their own indoor environment as intended.

Co-designing heat-health solutions with local communities, social housing residents, social care providers, and healthcare staff also ensures that measures, are informed by the ultimate end users and beneficiaries.

The following four 'Community and Culture' options for action (C.01-C.04) relate to meaningful engagement with communities, greater public and professional awareness of sustainable, efficient and equitable cooling practices, and the normalisation of a 'cooling culture' in London.

Together, these approaches will help embed sustainable cooling into the social fabric of the city, becoming a cultural norm, and making London more heat-healthy and heat-resilient.



Co-design cooling and adaptation strategies

Current gaps

The GLA is already actively engaging with Londoners to better understand people's experiences of heat, including how heat affects diverse groups and their need for cooling. Existing community engagement carried out or commissioned by the GLA includes a range of activities, such as Exercise Helios⁶⁶; the Talk London survey⁶⁷; targeted engagement with the voluntary, community, and faith sectors to inform the Heat Ready London plan; and joint work with the University of Liverpool to capture and collate stories of lived experience.

Many London boroughs have also begun to better understand how heat risk affects their communities and neighbourhoods (including, but not limited to, Islington, Camden, Westminster, Kensington and Chelsea, Lambeth, Southwark, Barnet, Richmond and Wandsworth).

Collectively, this work is helping to ensure that passive and sustainable cooling measures are not only technically effective, but also socially responsive and able to address spatial and environmental inequity within high heat risk areas.

Consolidating this work and encouraging it to continue across all London boroughs would help ensure that cooling strategies are targeted towards priority buildings in the focus sectors and that they are truly sustainable and equitable.

Option for action

→ C.01 Co-design cooling and adaptation with affected communities

→ C.01.1 Engage with focus sector stakeholders to understand specific and nuanced cooling needs and co-design cooling and adaptation measures based on the outcomes of the needs-assessments (Immediate Term 2026-2027)

→ C.01.2 Ongoing engagement with communities to monitor the impacts of measures and respond to the changing needs of communities over time (Short to Long Term 2027-2050+)

These options focus on co-designing sustainable cooling and heat-health measures with the people who live, work, or receive care in buildings within the three focus sectors. It would develop and expand upon (not duplicate) existing engagement programmes.

Beyond understanding existing heat risks and impacts, inclusive community engagement should be deployed to co-design and implement measures that reflect the needs of people, especially those most vulnerable to heat. Ongoing engagement would also be required to monitor the impact of any measures once implemented.

Research projects, like ClimaCare, have demonstrated the value of engaging communities in identifying heat-related risks and co-designing solutions specifically within social care settings. This approach could be replicated within the social housing and healthcare sectors to ensure that sustainable cooling measures are effective, equitable and supported.

Outcomes

Once the needs of local communities are identified and understood, this can feed into sustainable cooling solutions at the building level (see B.02) and public realm improvements (see L.01, L.02, and L.03).

Strategic objectives



Targeted communication on heat and sustainable cooling

Current gaps

The knee jerk reaction to thermal discomfort and the need for cooling within buildings in the UK is to install air conditioning, but only if people have the resources and agency to do so. However, people (including building owners, landlords, occupiers, tenants, and users) often lack awareness of the importance and co-benefits of passive cooling strategies for buildings and their surroundings.

Additionally, people may think the investment in cooling strategies is not worth it due to the short-term, seasonal nature of heatwaves and the fact that cold weather, keeping buildings warm, winter energy poverty, and wet weather and flooding, are also major concerns for Londoners. Also, even if overheating is not currently an issue for some people, it will likely be one in the future.

Option for action

→ C.02 Targeted and timely communication on heat, cooling equity, and passive cooling

→ C.02.1 Improve communication on passive and sustainable cooling solutions by promoting case studies and existing resources from boroughs to amplify awareness and application of equitable cooling for buildings and neighbourhoods (Immediate Term 2026-2027)

→ C.02.2 Develop more targeted communication on equitable and sustainable cooling through campaigns to educate the general public about the impacts of extreme heat, the risks of indoor overheating, and the benefits of passive cooling and behaviour change (Short Term 2027-2030)

→ C.02.3 Continue engaging the general public on passive and sustainable cooling, especially as new technologies are developed and become available on the market (refer to B.03). Introduce heat resilience, cooling equity, and sustainable cooling topics into school curricula, youth programmes, and professional qualifications to build long-term awareness (Medium Term 2030-2035)

These options focus on developing targeted, evidence-based communication about effective heat risk responses and appropriate heat risk solutions, for key decision makers and stakeholders in the focus sectors. It has a strong emphasis on seasonally-aligned and timely messaging.

Methods of communication to establish passive cooling as a default expectation in building design and retrofit, comparable to insulation and energy efficiency could include:

- Promoting case studies and success stories from London as part of a city-wide campaign to amplifying the momentum, awareness, and application of sustainable cooling systems for buildings and sustainable cooling more widely.
- Promoting existing resources for housing associations, landlords, and building managers on passive cooling strategies and how to implement them cost-effectively.
- Working with industries that are not yet engaged in the topic, but play a large role. For example, home improvement, gardening industries, and major retailers could do more to raise awareness of passive and sustainable cooling measures amongst customers.

Outcomes

Supporting behavioural change by engagement and education helps to shift habits and attitudes toward sustainable cooling practices, such as using external shading and natural ventilation. This subsequently establishes passive cooling as a default expectation in building design and retrofit, comparable to insulation and energy efficiency.

Strategic objectives



Heat-health and sustainable cooling training pathways

Current gaps

If active cooling systems are installed, users may lack awareness of their energy consumption and may not have the right knowledge to manage them efficiently. For example, staff and users in social care or healthcare settings may not know how to manage windows effectively, and reasons for keeping blinds and shutters closed may not be clear. Training can help promote heat-health-conscious behaviour, by teaching staff and occupants how to use natural ventilation, such as opening windows when outdoor conditions are suitable, and correctly operating other passive cooling strategies such as blinds and shutters.

Option for action

→ C.03 Integrate heat-health and cooling topics into existing training pathways

→ C.03.1 Enhance practice of integrating heat-health and sustainable cooling topics into existing training pathways for focus sector staff (Immediate Term 2026-2027)

→ C.03.2 Pilot workshops or online sessions for focus sector staff. Housing associations to develop handbook for tenants and tenant support officers on how to maximise passive cooling and respond to extreme heat situations (Short Term 2027-2030)

→ C.03.3 Continue engaging with focus sector staff on passive and sustainable cooling, especially as new technologies are developed and available on the market (B.03) (Medium Term 2030-2035)

These options propose enhancing the integration of heat-health and sustainable cooling content into existing training and education programmes relevant to the day-to-day work of non-built environment professionals and volunteers in focus sectors. This could include:

- Integrating heat-health and sustainable cooling training within existing focus sector training and

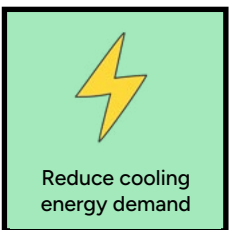
education programmes for medical, nursing, pharmacy and allied health professionals. Examples include the Centre for Sustainable Healthcare, Carbon Literacy Project, and the Social Care Institute for Excellence.

- Running pilot workshops or online sessions for frontline staff in care homes, GP practices, and housing associations in high heat risk boroughs.
- Housing associations developing handbook for tenants and tenant support officers on how to maximise passive cooling and respond to extreme heat situations.
- Roll out training across all London boroughs and integrate it into broader climate resilience and public health education strategies.

Outcomes

Giving staff, occupants and service users the information they need about why passive measures are necessary during hot weather periods, and how they can be used in combination with active cooling systems to contribute to comfortable, healthy and safe indoor temperatures. This helps establish passive cooling as a default expectation in focus sector buildings.

Strategic objectives



Sustainable cooling-related skills in the workforce

Current gaps

There is already a shortage of qualified air source heat pump (ASHP) installers in London and the UK, leading to a backlog of ASHP installations⁶⁸. Accelerating training to upskill enough people to install, maintain, and manage sustainable cooling systems (for example air-to-air pumps) is required in order to meet future cooling energy demand and deliver cooling effectively to the most vulnerable people.

Option for action

→ C.02 Targeted and timely communication on heat, cooling equity, and passive cooling

→ C.02.1 Improve communication on passive and sustainable cooling solutions by promoting case studies and existing resources from boroughs to amplify awareness and application of equitable cooling for buildings and neighbourhoods (Immediate Term 2026-2027)

→ C.02.2 Develop more targeted communication on equitable and sustainable cooling through campaigns to educate the general public about the impacts of extreme heat, the risks of indoor overheating, and the benefits of passive cooling and behaviour change (Short Term 2027-2030)

→ C.02.3 Continue engaging the general public on passive and sustainable cooling, especially as new technologies are developed and available on the market (refer to B.03). Introduce heat-resilience, cooling equity and sustainable cooling topics into school curricula, youth programmes, and professional qualifications to build long-term awareness (Medium Term 2030-2035)

These options focus on expanding and adapting existing green skills and construction programmes within the built environment sector to cover sustainable cooling technologies and their integration with passive measures.

A job market for the new workforce would be created, such as an incentive for contractors who

are currently trained in installing boilers and traditional heating, ventilation and cooling systems (HVAC) to be trained in ASHPs and other low-carbon mechanical cooling solutions.

Existing green skills programmes which have successfully supported workforce development in low-carbon technologies and sustainable construction could be extended and training content expanded to include training for energy efficient, low-carbon mechanical cooling systems, covering both installation and maintenance. The training could focus on technologies such as mechanical cooling, smart control systems, and refrigerants with low global warming potential, while also promoting the integration of passive cooling measures, and mixed-mode systems.

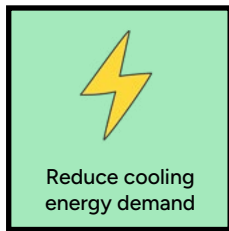
Existing green skills programmes could be expanded to include the installation, maintenance, and management of low-carbon mechanical cooling systems.

Colleges and existing training providers could also establish direct routes to training as a cooling engineer through courses and apprenticeships. For example, new training programmes could be launched through London colleges for the installation, maintenance, and management of low-carbon mechanical cooling systems.

Outcomes

This would not only support job creation and upskilling but also ensure that London is prepared to deliver sustainable cooling in both new developments and retrofit projects.

Strategic objectives



Wider impacts and co-benefits of C.01-C.04

If delivered, the options for actions could bring several wider impacts and co-benefits that extend beyond reducing cooling energy demand, addressing cooling poverty and inequity, and protecting the health of heat-vulnerable people:

- Strengthens social cohesion through collaborative processes bringing together diverse groups, encouraging dialogue, and collective action around heat-resilience.
- Empowers vulnerable populations by involving residents, especially those in social housing, care settings, or marginalised communities that are most affected by heat risk, promoting equity in decision-making.
- Reduces carbon emissions by encouraging passive cooling over energy-intensive air conditioning.
- Enhances quality of care through better-informed staff who can respond effectively to changing internal temperatures.
- Improves job security and career progression for workers in construction, HVAC, and building services.

Options for Action

Landscape and public realm

The following four 'Landscape and Public Realm' options for action (L.01-L.04) relate to delivering and informing Policy and Governance options for action, and achieving sustainable, efficient and equitable cooling through the planning, design, and management of London's outdoor spaces, landscape and public realm.

Cooling energy reduction strategies tend to focus on what can be done to buildings, yet outdoor environments play a critical role in shaping both indoor and outdoor thermal comfort in energy efficient and equitable ways.

In addition, current urban greening initiatives are not always linked to or targeted towards indoor or outdoor thermal comfort, or public health strategies.

Encouraging adaptation of external spaces and the public realm through urban greening and shading not only creates cooler and more comfortable outdoor spaces, especially for those who walk, cycle, wait at bus stops, or who do not have easy access to comfortable, healthy and safe indoor spaces, but it can also reduce cooling energy demand within buildings.

This would help to ensure London's public realm and publicly accessible buildings are healthier and safer places for heat-vulnerable people during hot weather.



Shaded routes and public spaces

Current gaps

London has made considerable strides in expanding urban greening through a range of programmes, funding initiatives, and strategic planning. Since 2016, over 600,000 trees have been planted across the city, supported by the London Environment Strategy and targeted using the Climate Risk Map to prioritise high-risk communities⁶⁹. Additionally, more than £30 million has been invested in green space and tree planting projects between 2016 and 2024⁷⁰. One key initiative, Trees for London, has delivered 95,000 trees focused on planting for shade, particularly on streets, in playgrounds, and in green spaces located in areas with low canopy cover and high levels of deprivation⁷¹.

These efforts are commendable and are already benefitting heat-vulnerable people in high heat risk areas. However, there is a growing need to intensify targeted tree planting and public shading efforts around the focus sector buildings. For example, creating shaded routes between people’s homes, care homes, GP surgeries, bus stops, hospitals, local shops, and other services are essential for comfortable, healthy and safe mobility during hot weather. Shading these critical parts of the public realm would not only reduce heat exposure, but would also improve accessibility and health equity for London’s most at-risk communities.

Option for action

→ **L.01 Create shaded routes and public spaces in high heat risk areas**

→ **L.01.1 Expand shaded routes and public spaces in high heat risk areas. Within current greening programmes, prioritise the greening and shading of pedestrian and public transport routes from social housing estates in high heat risk areas to healthcare and social care buildings and services (Immediate Term 2026-2027)**

→ **L.01.2 Plan for further shading of key routes and public spaces by undertake neighbourhood-level public realm heat risk studies to inform solutions (refer to P.05) (Short Term 2027-2030)**

→ **L.01.3 Incorporate public shading strategies based on recommendations from the public realm heat risk studies (Medium Term 2030-2035)**

→ **L.01.4 Ensure the adequate long-term maintenance of installed greening solutions (Long Term 2035-2050+)**

These options focus on expanding the delivery of shade and green infrastructure where it can most benefit focus sector buildings and their residents and users. For example, along key walking, wheeling and public transport routes between people’s homes, care facilities, health services and amenities.

Strategies include, but are not limited to, planting trees, the use of climbing plants, hanging plants and pergolas, building-mounted awnings at ground level, and freestanding human-made shade structures. To be effective, these strategies would ideally be guided by borough-specific public realm heat risk studies (see P.05) and would require sufficient resources for maintenance and irrigation to ensure their full cooling potential.

Outcomes

Increasing tree canopy coverage and installing shade structures in high heat risk areas is a vital strategy for creating cooler, more resilient urban environments in London. This helps reduce surface and ambient temperatures, mitigate the urban heat island effect, and subsequently reduces cooling energy demand within buildings and provides immediate relief for people during hot weather.

Strategic objectives



Cool, healthy and safe spaces

Current gaps

From the stakeholder engagement, a number of participants did not feel like there are enough safe and accessible places in London to find respite from the heat. Some stated they did not know the GLA’s cool spaces existed, indicating a gap between service provision and communication. Those who have heard of them expressed that there weren’t enough cool spaces in their area, specifically in outer London boroughs.

Option for action

→ **L.02 Increase equitable access to cool, healthy and safe spaces**

→ **L.02.1 Increase equitable access to cool, healthy and safe spaces by improving the visibility and identity of existing cool spaces through marketing and communication strategies and identify locations for potential new cool spaces (Immediate Term 2026-2027)**

→ **L.02.2 As part of the public realm heat risk studies for each borough (see.P.04), create new cool spaces in strategic locations where they can provide the most benefit (Short Term 2027-2030)**

→ **L.02.3 Continue expanding equitable access to cool, healthy and safe spaces (Medium Term 2030-2035)**

→ **L.02.4 Ensure 100% of borough residents are within a 10-minute walk from a cool space (an outdoor space, park or building that provides good levels of thermal comfort, health and safety for vulnerable people during hot weather) (Long Term 2035-2050+)**

These options focus on improving practical, equitable access to a network of cool indoor and outdoor spaces, particularly for people who cannot keep their homes cool, or for social care and health care facilities which are challenging to keep cool. The cool spaces should be prioritised in areas around focus sector buildings and the walking and wheeling routes in between them.

For example:

- shaded, green, and welcoming outdoor areas within and around social housing estates
- NHS Forest promotes the integration of green infrastructure and enhancement of existing green spaces into NHS estates. Existing initiatives such as this should be expanded to include targeted cooling measures, such as shaded seating areas, tree planting, and water features, especially in high heat risk areas.

Outcomes

By expanding access to cool spaces, immediate relief from the heat can be provided for people while longer-term cooling measures for existing focus sector buildings are being deployed. These spaces can also reduce the urban heat island effect, lower cooling energy demand in buildings, and offer accessible, comfortable, healthy and safe environments for vulnerable people during hot weather.

Strategic objectives



Cool and green roofs

Current gaps

Albedo refers to the reflectivity of solar energy by materials and surfaces. A surface with a high albedo, such as white coloured wall, reflects more heat than it absorbs, whereas a surface with a low albedo, such as an asphalt road, absorbs more heat and warms its local environment.

As dark-coloured buildings absorb more heat, painting roofs and walls with white or reflective paint helps reflect sunlight and regulate the local temperature. Albedo can also be increased through green infrastructure, such as green roofs and climbing or hanging plants. Lighter-coloured vegetated or heat-reflective surface materials can regulate external and internal temperatures, to reduce cooling energy demand in buildings.

Policies such as the Urban Greening Factor mandate green infrastructure, such as green roofs, for new major developments. Foundational work, such as the GLA's 'Roofs Designed to Cool' report⁷², has also been carried out to develop a rationale and strategy for incorporating cool roofs across London. However, there are currently no programmes to incorporate cool roofs for existing buildings in London, particularly for focus sector buildings.

Option for action

- **L.03 Expand use of cool and green roofs and façades in priority buildings**
- **L.03.1 Identify focus sector buildings that are suitable for a cool or green roof retrofit, prioritising high heat risk areas first (Immediate Term 2026-2027)**
- **L.03.2 Pilot cool and green roof programme for focus sector buildings in the focus sectors, prioritising buildings in high heat risk areas first (Short Term 2027-2030)**
- **L.03.3 Deploy the cool and green roofs programme for focus sector buildings in the focus sectors, based on technical feasibility and outcomes from the overheating assessments**

(refer to B.01) (Medium Term 2031-2035)

→ L.03.4 Retrofit all suitable roofs on buildings within the focus sectors with a cool or green roof (Long Term 2036-2050+)

These options focus on deploying cool roofs, green roofs and cool façades (that is external surface materials with low albedo values) on focus sector buildings. Emphasis is on where these measures can have the greatest combined benefit for cooling energy demand, heat-health, and wider environmental goals. There may also be opportunities to complement energy efficiency and warm homes programmes, for example if combined with external insulation measures (see B.02).

A cool roof and wall programme could be considered for priority buildings in focus sectors within high heat risk areas. The programme could build upon the GLA's existing work to implement cool roofs and walls on a city-wide scale, targeting buildings in the focus sectors first. The programme could consider incorporating an incentive scheme with financial benefits to encourage the wide-scale application of cool roofs and façades.

Outcomes

Roofs painted with white paint or reflective materials have the potential to provide a 1.2°C reduction in external air temperatures in London, as well as regulating internal temperatures and reducing indoor overheating⁷³. Implemented at scale, cool roofs would make a considerable contribution to reducing the urban heat island effect, improving building resilience, and lowering the need for mechanical cooling.

Strategic objectives



Reduce and reuse waste heat

Current gaps

London benefits from a range of initiatives to reduce vehicle emissions, improve public transport, and pedestrianise the city, all of which are improving air quality and public health. These initiatives also provide the co-benefit of reducing London's urban heat island.

Existing programmes to promote walking, cycling, and the use of public transport are already reducing reliance on private motor vehicles and lowering waste heat emissions from traffic-heavy areas, such as through the London Environment Strategy (2018)⁷⁴, and the introduction of the Ultra Low Emission Zone (ULEZ) and the Healthy Streets Approach. These efforts are complemented by infrastructure upgrades, which support the transition to electric, cooler-running public transport.

Other than transport, waste heat also comes from industries and the 'dumping' of heat from large mechanical cooling systems for buildings, such as offices and data centres. There are ongoing technology developments in re-using waste heat from cooling systems for buildings and activities that still require heat during hot weather, for example swimming pools, leisure centres, and laundries.

The London Transport Strategy promotes walking, cycling, and the use of public transport, reducing reliance on private vehicles and lowering waste heat emissions from traffic-heavy areas. These efforts are complemented by infrastructure upgrades under the Bus Action Plan and Zero Emission Bus Programme, which support the transition to electric, cooler-running public transport.

The GLA also commissioned 'Optimising Data Centres in London' report⁷⁵ explores the feasibility of reusing waste heat from data centres on a London wide scale. Further research would be required to understand how waste heat can be captured from and potentially used for cooling of focus sector buildings.

Option for action

- **L.04 Reduce and reuse waste heat from transport and buildings**
- **L.04.1 Continue to encourage urban planning and development that minimises the need for motor vehicles to reduce waste heat (Immediate Term 2026-2027)**
- **L.04.2 Promote the research and development of re-using waste heat from large active cooling sources such as data centres and offices, to generate useable energy for suitable buildings during hotter months (Short Term 2027-2030)**

These options focus on continuing to reduce waste heat from sources including transport, buildings and industrial processes to reduce its contribution to the UHI effect. It also explores the beneficial reuse of waste heat from transport, buildings and industrial processes which use active cooling systems and products, to turn it into useful heat in another location.

Outcomes

Collectively, these actions help reduce the amount of waste heat released into London's streets and neighbourhoods, lowering the intensity of the UHI effect. A cooler outdoor environment, in turn, creates the conditions for buildings to stay naturally cooler, reducing the risk of indoor overheating and lowering overall cooling energy demand.

Strategic objectives



Wider impacts and co-benefits of L.01-L.04

If delivered, the options for actions could bring several wider impacts and co-benefits that extend beyond reducing cooling energy demand, addressing cooling poverty and inequity, and protecting the health of heat-vulnerable people:

- Improves public realm through the design of streets, parks, and public spaces.
- Biodiversity and urban greening enhancements through the integration of nature-based solutions in high heat risk areas.
- Improves urban air quality.
- Encourages outdoor activity, improves accessibility and health equity, and enhances the overall quality of life.
- Reduces flood risk through combining with Sustainable Drainage Systems (SuDS).

7.2 Towards sustainable, efficient, and equitable cooling

The following sections presents an illustrative analysis of how cooling energy demand in London, and separately in two London boroughs, could be reduced if the recommended options for action and related cooling measures are implemented effectively over time.

The analysis builds directly upon the BAU cooling energy demand projections and overlays the expected impact of implementing the CRL, moving towards the **Sustainable, Efficient and Equitable Cooling (SEC) scenario**.

The objective is not to forecast precise future cooling energy demand but to illustrate:

- The scale and timing of potential reductions in cooling energy demand.
- The contribution of different options for action and the related cooling measures or ‘fundamentals’
- Differences in impact on cooling energy demand between boroughs, due to their building stock, land-use mix, urban morphology, and heat-vulnerability profile.
- Specific implications for existing buildings in the focus sectors.

This SEC scenario demonstrates a ‘what good looks like’ trajectory for London and its boroughs with early, coordinated, and equity-led heat-resilience action using the CRL.

The SEC scenario applies a structured method to estimate cooling energy demand reduction from 2026–2050, outlined in this section.

Step 1: BAU cooling energy demand projections

The BAU cooling energy demand projections were developed using a multi-source and multi-method hybrid approach to analysing data which combined:

- Existing literature and empirical estimates of cooling energy use in London and comparable cities.
- Previous London- and UK-specific research on overheating, cooling loads and active cooling uptake.
- Engineering-based calculations for representative building archetypes across key sectors.
- Dynamic modelling of selected building types to validate and calibrate the engineering estimates.

These results were then scaled down and aggregated to the London-borough level, using available data on building types, sectoral activity patterns and relevant demographic indicators.

This BAU scenario forms a fixed baseline, against which the impact of future cooling measures is assessed.

Step 2: Identify which measures become active in each phase of the CRL

The CRL options for action relate to the four groups of measures to achieve sustainable, efficient, and equitable cooling, referred to as the fundamentals, by either indirectly or directly enabling them to be implemented. For example, B.02 drives large-scale deployment of external shading, cool roofs, ventilation improvements, and insulation upgrades.

The SEC scenario establishes an adoption curve for each measure informed by:

- The phasing of relevant options for action and related cooling measures.
- Retrofit programme cycles.

- Planning and regulatory changes.
- Workforce and supply-chain readiness.
- Borough-specific characteristics.
- Expected speed of practical scaling

This produces a phased timescale for implementation of the options for action, the related cooling measures and a scaling pathway.

Step 3: Assign reasonable reduction factors for each cooling measure

Each cooling measure is associated with a typical percentage reduction in cooling energy demand once adopted, dependant on the building type. For example, external shading for social housing could have a 5–15% reduction depending on façade orientation, but external shading for hospitals could have an 8–20% reduction depending on façade orientation.

Please see Appendix D for more details on the evidence base and assumptions behind these factors.

This is later applied to the borough-specific modelling outputs for each focus sector.

Step 4: Apply adoption rates and reduction factors to each year

A phased breakdown from 2026–2050 sets out which measures are implemented or playing out and the cumulative uptake of the measures (for example, the percentage of applicable building stock). The three phases are as follows:

- Stage 1 – Early steps (2025-2030).
- Stage 2 – Scaling (2031-2035).
- Stage 3 – Embedding (2036-2050).

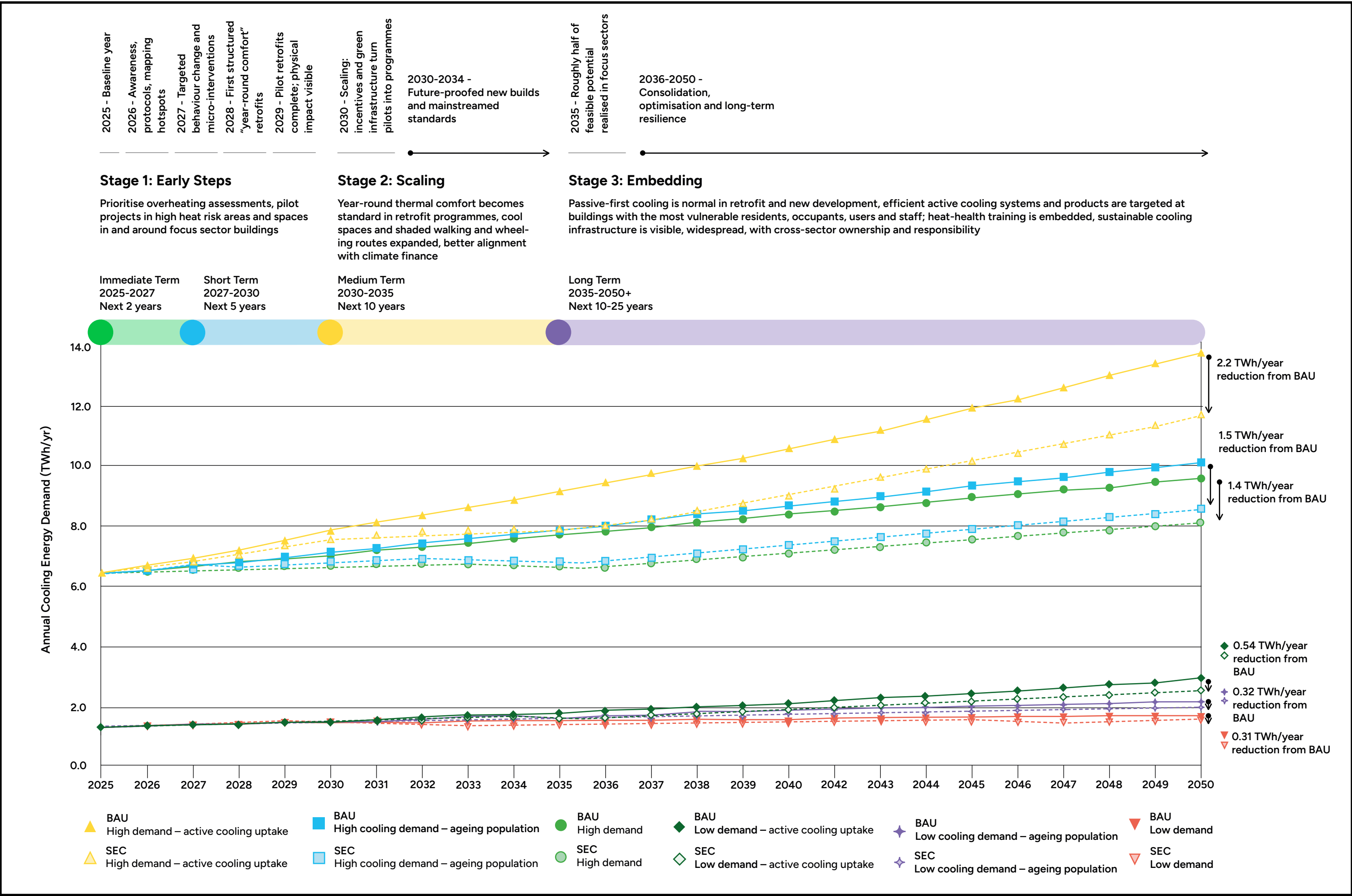
This produces a trajectory of gradually widening divergence between the BAU scenario curve and the SEC scenario ‘good practice implementation’ curve. This represents a best-case scenario for when particular cooling measures could be implemented, rather than dictating what is feasible and realistic, as this will explored and established by the Heat Ready London plan.

Step 5: Evaluate building sector-specific impacts

Each phase’s calculations are disaggregated by building sector, with enhanced detail for the three focus sectors. This ensures the CRL prioritises the sectors with buildings lived in and used by some of London’s most heat-vulnerable individuals.

A phased breakdown of the SEC scenario analysis is illustrated in Figures 7. Further details can be found in Appendix E.

Figure 7: Annual cooling energy demand projections for London based on the CRL and SEC scenario (2026-2050)



Phase 1 - Early steps

All buildings

The start of Phase 1 focuses on awareness (C.02), assessments (B.01), and behaviour change (C.02), rather than capital works. Clear indoor maximum temperature guidance (P.01), improved monitoring (B.04), staff training (C.03) and simple operational adjustments (C.02), such as shading use, window management, early night ventilation, start to reduce unnecessary active cooling or overcooling and enable better building management. These options for action deliver small, but structured, reductions in cooling energy demand, laying the behavioural and governance foundations needed for later success.

Initial physical measures are introduced through early pilot programmes, especially in early 'year round comfort' retrofits that install internal and external shading, improved natural ventilation, cool roofs, and reduced internal heat gains. By the end of Phase 1, the first demonstrator retrofits are complete, proving the effectiveness of passive-first design.

Focus sectors

Landlords begin by logging overheating complaints and offering residents practical advice on shading and ventilation, producing only small, highly localised improvements. Some co-design programmes are also piloted, which help target interventions.

Care homes begin by piloting basic heat protocols following current recommendations in the UKHSA action cards for health and care settings⁷⁶, such as pre-emptive shading, moving residents to cooler rooms, and cautious night ventilation, supported by staff training to reduce exposure risk rather than energy use. Heat health training is expanded, internal shading is added to the most vulnerable rooms, and routines are adjusted to better match daily thermal conditions.

Healthcare settings begin by identifying overheated areas and implementing small operational fixes, better shading use, adjusted cooling setpoints, and avoiding simultaneous heating and cooling) to reduce waste rather than overall demand. A minority of hospitals undergoing refurbishment introduce solar control glazing, limited external shading, and summer safe insulation, with early signs of reduced cooling plant run time in upgraded zones.

Phase 2 - Scaling

All buildings

Phase 2 of the CRL focuses on scaling up efforts. The future-proofing of policies and pilot projects in the focus sectors are turned into programmes. With financial incentives and climate finance alignment (P.06) in place, proven measures in pilot projects begin to be rolled out at scale.

External and internal shading, cross-ventilation, and cool roofs and walls become standard components of many retrofit programmes (B.02) and green infrastructure expands around and between buildings (L.01, L.02, L.03) reducing solar exposure and local ambient temperatures. Behavioural change reaches remaining laggards rather than early adopters.

Future-proofed planning and retrofit standards mean that new buildings and major refurbishments default to passively resilient designs with low heat gain. External shading, solar-control glazing, effective natural ventilation, and cool roofs and walls are widely specified.

Active cooling systems are increasingly efficient and correctly sized, operating in buildings with lower baseline cooling loads.

By 2035, around half of the realistic cooling energy demand reduction potential in high-priority focus sector buildings has been achieved. Most remaining gains come from finishing deeper retrofits, consolidating green infrastructure, filling shading gaps, and upgrading active cooling plants where still required.

Focus sectors

In social housing, social care and healthcare buildings, the balance of cooling energy demand reduction now decisively favours physical measures, with behaviour and controls ensuring performance rather than driving energy savings.

By the end of Phase 2, the focus sectors now operate within a fundamentally different thermal baseline: lower solar gains, cooler neighbourhoods, and better-managed systems. Cooling energy demand is lower, flatter, and more predictable than under BAU.

All buildings

Phase 3 is all about embedding sustainable cooling and ensuring long-term heat resilience.

By this stage, most technically and socially feasible passive cooling measures have been deployed in priority focus sector buildings and locations, and the emphasis moves to making these measures work reliably over decades, adapting them to future climate conditions, and integrating them into normal asset management cycles. Cooling energy demand reductions during this period arise less from adding new measures and more from:

- Replacement cycles (older cooling plant replaced with high-efficiency heat pumps or networked systems sized to much lower loads);
- System-level optimisation (controls, setpoints, zoning, and scheduling informed by long-term monitoring data);
- Cumulative urban cooling effects, such as mature tree canopy cover, cool roofs and façades, and shaded routes reduce ambient temperatures and peak heat exposure; and
- Behavioural resilience, as heat-aware operational practices are embedded into professional norms rather than relying on campaigns.

Cooling energy demand does not fall to zero, but it becomes structurally lower, flatter across heat events, and more predictable than in the BAU trajectory.

Focus sectors

In existing social housing, multi-year retrofit pipelines have addressed many estates, and remaining work focuses on smaller blocks, complex ownership structures, or particularly hard-to-treat typologies.

Social care buildings reach a relatively stable, heat-resilient state during this period. Most large or publicly operated facilities have passively resilient envelopes, shaded outdoor spaces, and efficient, well-controlled cooling systems for the spaces that genuinely require them.

In the healthcare sector, most large hospitals and healthcare campuses have undergone at least one full cycle of heat-resilience upgrade. District cooling, where deployed, provides additional resilience for large campuses, reducing peak electricity demand during heatwaves. Mature green infrastructure around hospital sites reduce external heat stress for patients and staff, further lowering internal cooling loads.

7.3 Borough Insights

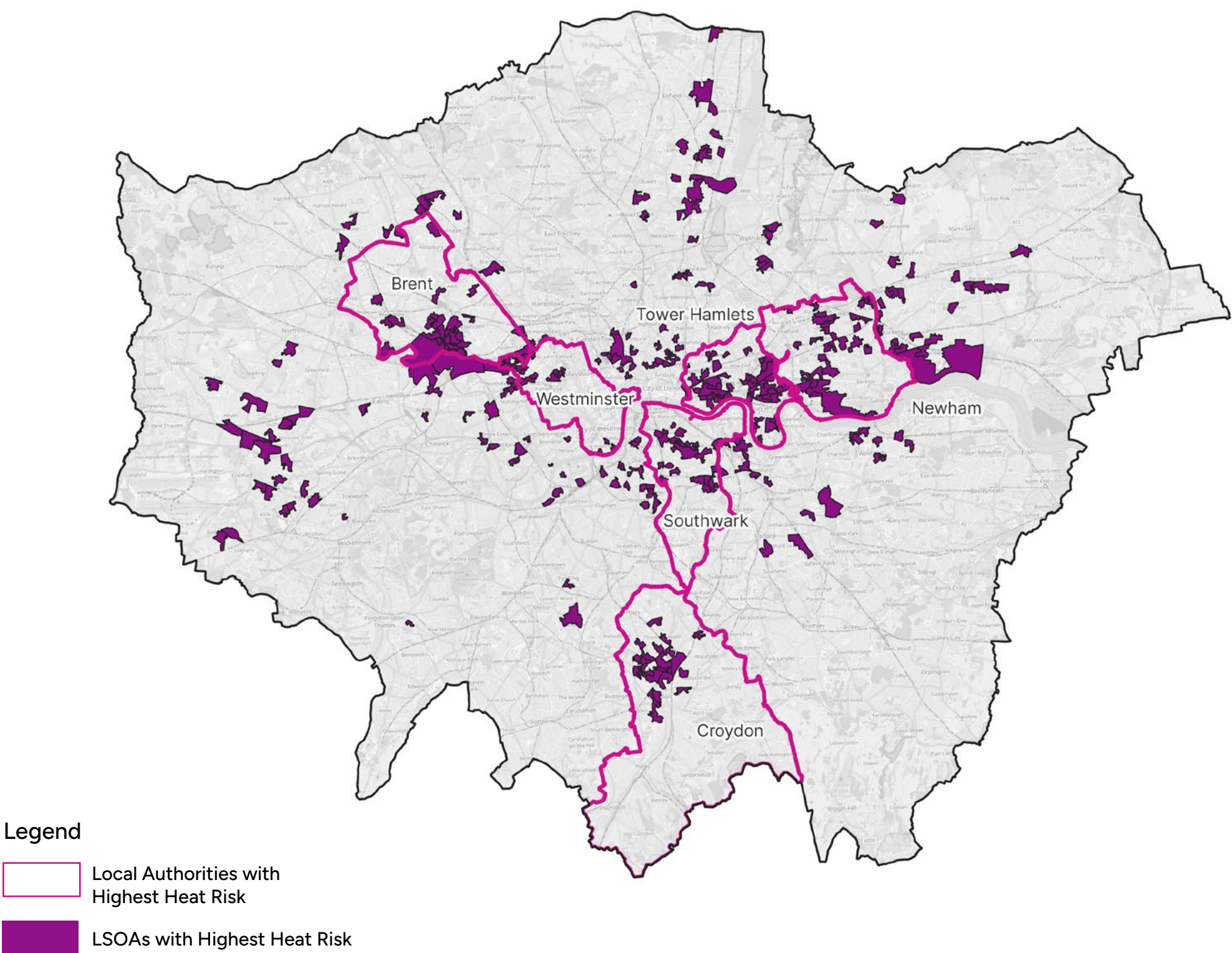
The CRL is intended to be used across all boroughs in London, particularly for the three focus sectors within them. The CRL has been applied to two London boroughs, informed by a multi-criteria analysis of the 32 boroughs and the City of London to compare relevant factors. These included the proportion of sensitive population, healthcare, social care and social housing buildings, public green space, policy frameworks, and population density. Heat risk was also taken into consideration, specifically by mapping the top five boroughs with the highest number of ‘high risk’ Lower Super Output Areas (LSOAs) according to the GLA’s Climate Risk Map⁷⁷ (see Figure 8). From this assessment, two boroughs were selected due to their distinctly different characteristics as inner- and outer-London boroughs, respectively, which both contain a high number of areas with high heat risk.

The two selected boroughs have been anonymised for the purpose of this report, as one was content to be named and the other preferred anonymity. Therefore for parity they are referred to as ‘Borough #1’ and ‘Borough #2’. Borough #1 is an inner-London borough with a higher concentration of healthcare facilities, social housing, rented accommodation, and heritage buildings. Borough #2 is an outer-London borough with a higher proportion of social care buildings.

As part of the two case studies, consideration was given to how the three focus sectors might utilise the CRL at a more local level. The purpose of this exercise is evaluate how useful the CRL is in a real-world local authority context, taking account of adopted planning policies, infrastructure plans, energy strategies, and retrofit programmes. The intention is for London boroughs to use this approach to scale up sustainable cooling measures.

The following section sets out how the CRL could be applied to each borough.

Figure 8: The top five boroughs in London with the highest number of ‘high heat risk’ LSOAs, according to the GLA’s Climate Risk Map.



Overview

Borough #1 is one of London's most densely built and visited boroughs. It has a resident population of over 200,000 across a relatively small footprint, and many more people visiting and working in the borough daily.

The borough has a young demographic profile, with the proportion of heat-sensitive population (over 65 year olds and under 10 year olds) being close to the London average. However, Borough #1 has a high proportion of single-person households (45%), increasing vulnerability during heatwaves, particularly for older adults.

Housing, urban form and heritage

The housing profile of Borough #1 is dominated by the rental and social housing sector, with over 70% rented households and over 30% rented social housing, making sustainable cooling investment dependent on landlord or freeholder action rather than tenants. This could potentially slow retrofit progress, or alternatively could represent an opportunity to retrofit at scale. Borough #1 also contains over 50 conservation areas, covering over 75% of the surface area of the borough, which restricts the extent and ease of permissible adaptations, especially external shading, façade treatments, or major retrofits.

Health and social care infrastructure

Borough #1 faces heat adaptation challenges due to the high proportion of health care buildings and health inequalities across its wards. It's healthcare buildings play a critical regional role during heatwaves. The borough's wide disparities in health outcomes between wards mean that sustainable cooling measures must be designed to address both clinical settings and community-based risk, ensuring adequate protection for residents with pre existing health conditions.

Urban heat and the environment

Although Borough #1 has many public parks, opportunities to expand green corridors and create connected natural shade networks are limited by its compact and heavily developed landscape. Tree canopy cover is unevenly distributed, with lower levels of shade in areas of higher deprivation, exacerbating heat exposure for more vulnerable communities.

The borough's low car reliance and extensive public transport, walking and cycling networks help limit waste heat from motorised vehicles and support cooler local temperatures. However, as a major tourist destination, with a high concentration of administrative and commercial buildings, the borough experiences intense pedestrian activity and high building occupancy levels, which can amplify the urban heat island effect.

Policy context

Borough #1 shows strong leadership on climate resilience and sustainable cooling policy. The borough has established robust overheating and cooling guidance, including Supplementary Planning Documents and other strategies regarding sustainable cooling. This framework commits the borough to supporting climate-adapted development and integrating sustainable cooling principles throughout the planning process. However, despite this strong policy direction, heritage constraints and the high proportion of rented housing in the borough present delivery challenges, limiting the pace and scope of building-level retrofit.

Summary

Borough #1 is one of London's most densely built and visited boroughs, facing acute heat adaptation challenges due to its intense urban form, health inequalities, and a high concentration of social housing and healthcare buildings. Retrofitting for cooling and adaptation can be challenging, as landlords, tenants, heritage constraints, and planning processes all affect delivery and uptake. Despite these challenges, Borough #1 benefits from a strong policy foundation that supports heat resilient approaches.

Potential priority actions for Borough #1 to consider are set out below:

Phase 1 - Early steps

- Prioritise overheating assessments of focus sector buildings, especially heritage buildings, and the co-designing of solutions with building users (see B.01 and C.01)
- Continue piloting social housing retrofits and neighbourhood-based cooling pilots in deprived areas with low tree canopy cover (see B.02 and L.02).
- Establish feasibility of integrating district cooling networks into plans for upgrading district heating networks (see B.04).

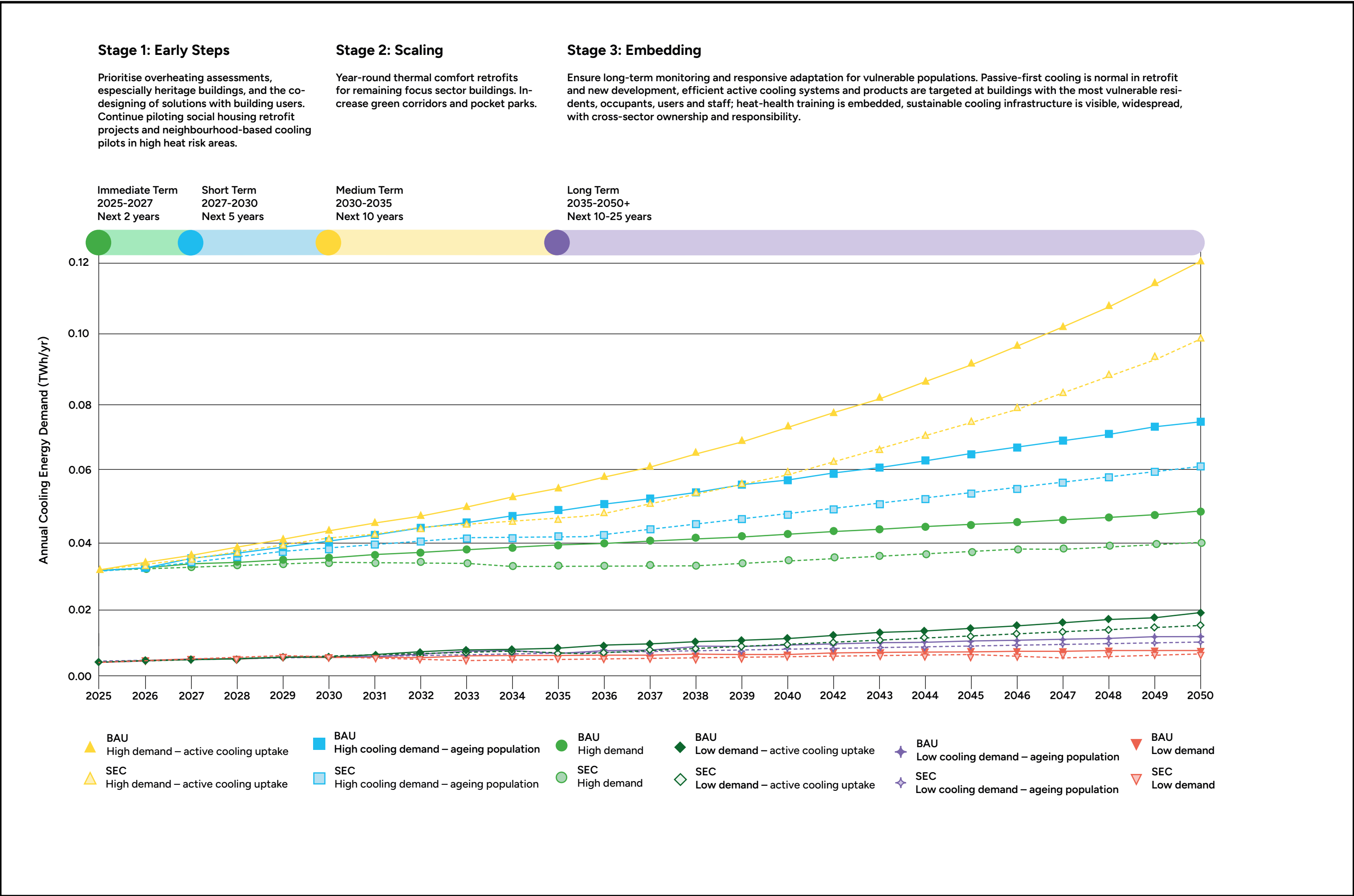
Phase 2 - Scaling

- Retrofit focus sector buildings with passive cooling and shading (see B.02).
- Increase green corridors and pocket parks where space allows (see L.01 and L.02).

Stage 3 - Embedding

- Ensure long-term monitoring and responsive adaptation for vulnerable populations, especially in socially rented housing (see B.05 and C.01).

Figure 9: Annual cooling energy demand projections for Borough #1 based on the CRL and SEC scenario (2026-2050)



Overview

Borough #2 is one of London's most populous boroughs and, with a rapidly growing and ageing population, it is projected to reach over 500,000 residents by 2050. This demographic shift increases the borough's exposure to heat-related risk, particularly as Borough #2 has a higher than average proportion of heat-vulnerable people (young children and older adults) and a greater number of deprived areas than the London average.

Housing, urban form and heritage

Borough #2 has a large and diverse housing stock, including over 20 conservation areas. There is a lower proportion of social housing than the London average, but this is concentrated primarily in the north and eastern parts of the borough, meaning that heat risk vulnerabilities are unevenly distributed. The borough has delivered high levels of affordable housing and continues to see a high rate of additional dwellings.

Health and social care infrastructure

The health system in the borough is a critical asset during heatwaves. Although Borough #2 has a lower proportion of healthcare buildings than the London average, it has one of the highest number of social care buildings of all London boroughs. Given the shift toward community-based care and falling residential care admission rates, heat resilience and sustainable

cooling efforts must extend beyond acute healthcare buildings and formal social care facilities into the borough's distributed network of health centres, clinics, community centres, and the homes of older adults.

Urban heat and the environment

Borough #2 has ambitions to strengthen green infrastructure networks and deliver incremental shading and cooling benefits over time. This is particularly important in a borough with heavy reliance on private transport, which currently limits the co-benefits more commonly seen in areas of London with stronger public and active transport provision.

Policy context

Local policy within Borough #2 is currently under review, and includes references to the cooling hierarchy, shading, and green infrastructure.

However, the borough does not currently have specific overheating guidance, mandatory requirements for overheating assessments, nor a dedicated sustainable cooling strategy. This creates gaps in resilience planning, particularly for social housing, social care, and healthcare buildings that accommodate some of the borough's most heat-vulnerable residents. It also represents an opportunity to use the borough's assets and follow good practice policy examples from other London boroughs.

Summary

Borough #2 has a growing and ageing population, concentrations of social housing, pockets of deprivation, and number of residential care homes. It is moving towards more community-based health and care networks which makes it one of London's most strategically important boroughs for heat risk action.

While the borough benefits from strong and innovative delivery of affordable housing and commitments to green infrastructure, gaps in overheating and adaptation policy present some challenges. Borough #2 could begin by prioritising efforts towards developing policy frameworks for sustainable cooling and heat adaptation to establish a basis for implementing the options for action within the CRL. The borough could also utilise its large amount of lower density spaces and upcoming green infrastructure projects, to target cooling strategies towards its growing heat-vulnerable population and high deprivation areas.

Potential priority actions for Borough #2 to consider are set out below:

Phase 1 - Early steps

- Develop local overheating policy and sustainable cooling guidance and strategies (see P.04).
- Continue tree planting and shading programs (see L.01) while starting community engagement to co-design sustainable cooling strategies (see C.01).
- Map vulnerable populations and priority focus sector buildings for implementation of sustainable cooling measures (see B.01 and B.02).

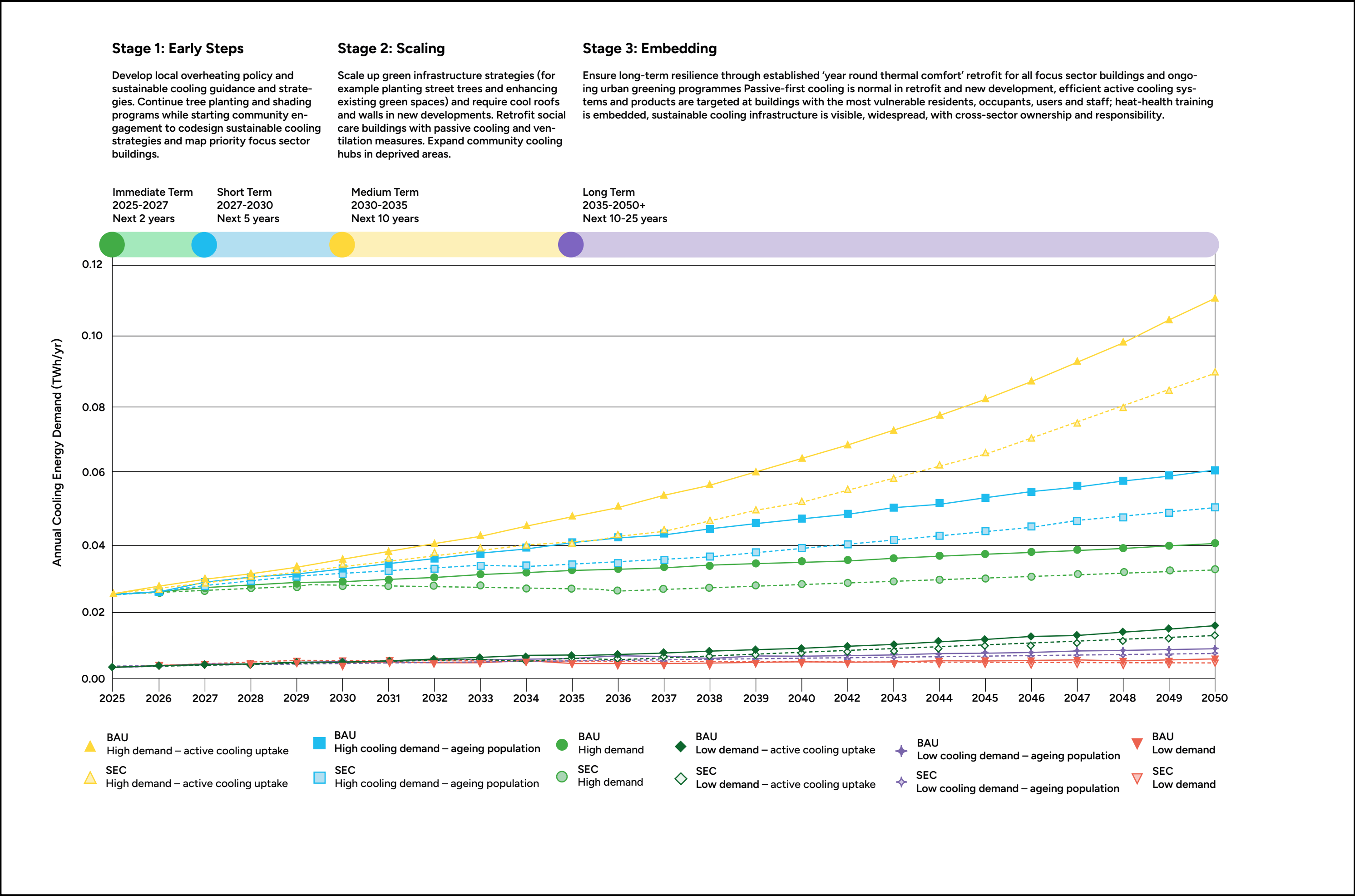
Phase 2 - Scaling

- Scale up green infrastructure strategies (for example, planting street trees and enhancing existing green spaces) and require cool roofs and walls in new developments (see L.02, L.03).
- Retrofit social care buildings with passive cooling and ventilation measures (see B.02).
- Expand community cooling hubs in deprived areas (see L.02).

Phase 3 - Embedding

- Ensure long-term resilience through established 'year round thermal comfort' retrofit for all focus sector buildings and ongoing urban greening programmes (see B.01 and L.01-L.03).

Figure 10: Annual cooling energy demand projections for Borough #2 based on the CRL and SEC scenario (2026-2050)



8. Conclusion and Next Steps

Conclusion

London is at the forefront of the UK's heat risk challenge, requiring an urgent, place-based and people-centred approach to effectively manage thermal comfort, safeguard public health, and address future energy needs. London is also well positioned to reframe this challenge as an opportunity to put environmental, social and economic justice at the heart of action to prepare for, respond to and recover from heat impacts in the context of climate change.

Following the BAU scenario puts London at risk of an increase in cooling energy demand and social inequity. However, this is not inevitable. Using the CRL to move towards the SEC scenario could deliver transformative benefits for London in terms of climate resilience, cooling energy reduction, cooling equity, residents' health and social justice.

Starting with the focus sectors is a priority as residents and occupants of buildings in these sectors are disproportionately impacted by heat. They often cannot relocate, control their environments, or tolerate heat, putting them at greater risk during hot weather.

The CRL provides a city-wide strategic framework that boroughs can interpret and apply according to their local context. The CRL enables the prioritisation and normalisation of passive and nature-based cooling measures and the mainstreaming of more sustainable and efficient active cooling products and systems. The resulting reductions in annual cooling energy demand could lower the risk of cascading failures resulting from an overstretched energy grid during hot weather. This would reduce the risk of related disruption to healthcare, transport, and essential services, whilst protecting London's most heat-vulnerable populations and ensuring social justice.

Understanding the spatial distribution of heat risk is also essential for prioritising cooling strategies, as it highlights where place-based or building-based approaches are most needed. It also ensures that responses reflect differences in local building stock, demographic profiles, and policy readiness.

The contrasting case studies of the two selected London boroughs illustrate how the same set of options for action can be adapted to the distinct characteristics of a local area. This helps to support borough-led decision-making, while maintaining a coherent, London-wide approach to reducing heat risk.

Next steps

The insights and evidence from the CRL will directly support the development of the Heat Ready London plan, ensuring that decisions about resilience investment reflect an understanding of current and future cooling energy demand, heat vulnerability, and focus sector-specific needs.

The findings from the CRL will also contribute to strengthening city-wide preparedness for extreme heat and protecting the health of London's most vulnerable residents as the climate and the city continue to heat up.

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