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# ENERGY IN BUILDINGS

## EMEA 2024

Europe, the Middle East & Africa

FRIDAY - SATURDAY

NOVEMBER 22-23, 2024

@ 9:00-18:00

### SESSIONS:

- SUSTAINABILITY
- HEALTH & SAFETY
- DECARBONIZATION
- TECHNICAL SOLUTIONS
- DIGITAL ENVIRONMENT
- POLICIES & LEGISLATION
- ENERGY EFFICIENCY FIRST
- RESILIENCE TO CLIMATE CRISIS

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## Thermal Comfort in a Changing Climate

Dr Anastasia Mylona, CEng, MCIBSE, Technical Director CIBSE

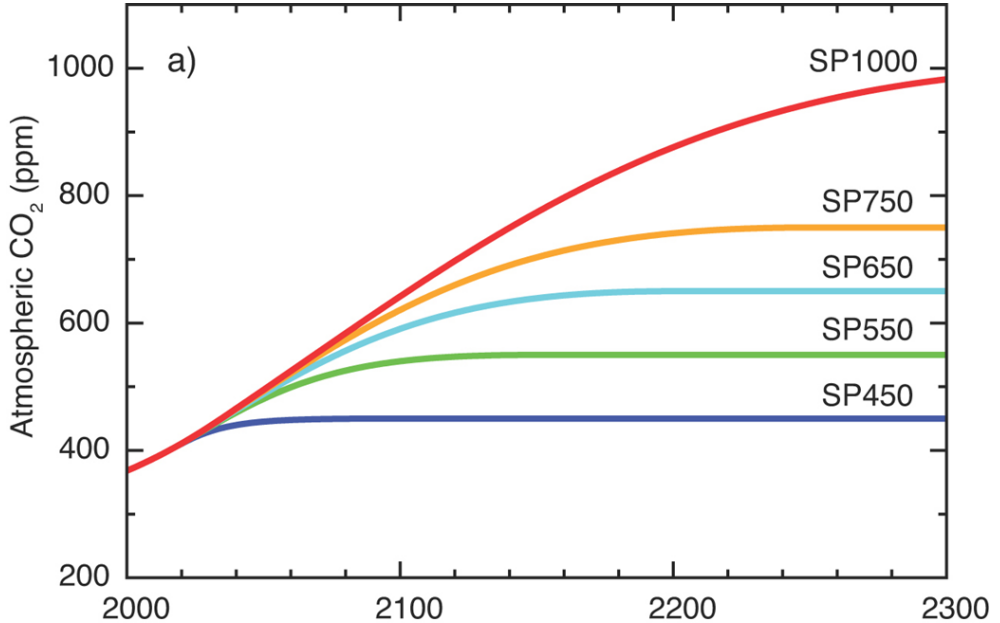
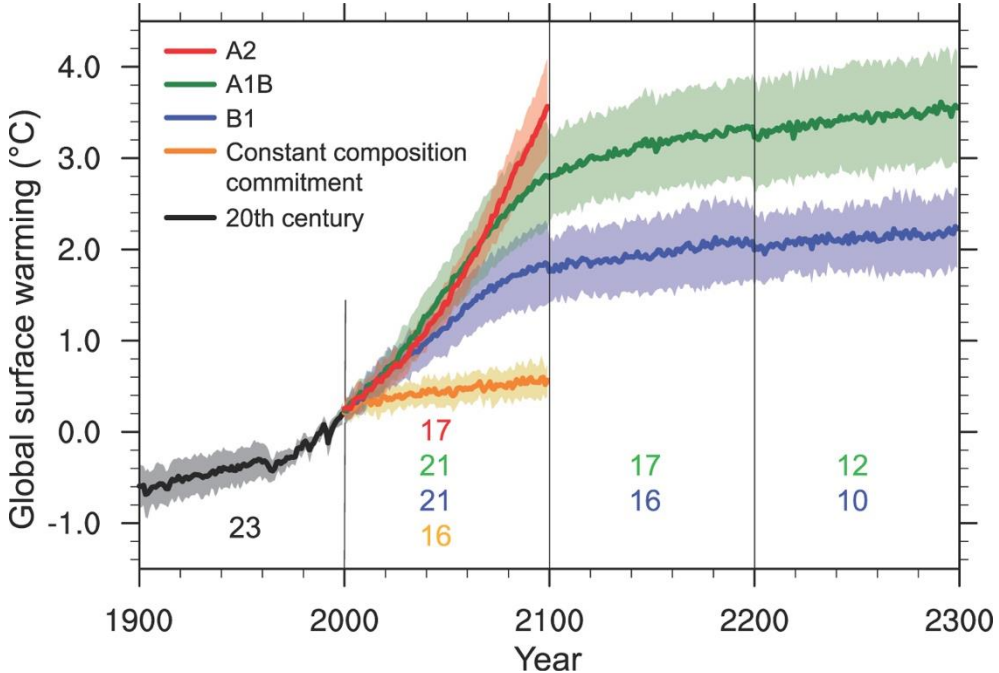
# Who is CIBSE

- Global professional institution with almost 22,000 members of which 30.5% are based internationally.
- Leading authority and standard setter on building services engineering.
- Leading on global practice in the profession (TM65 embodied carbon methodology has been adapted to multiple regions around the world).
- We advance the careers of building services engineers through accreditation, training and technical guidance.
- We work closely with government, providing expert advice which informs policy making.

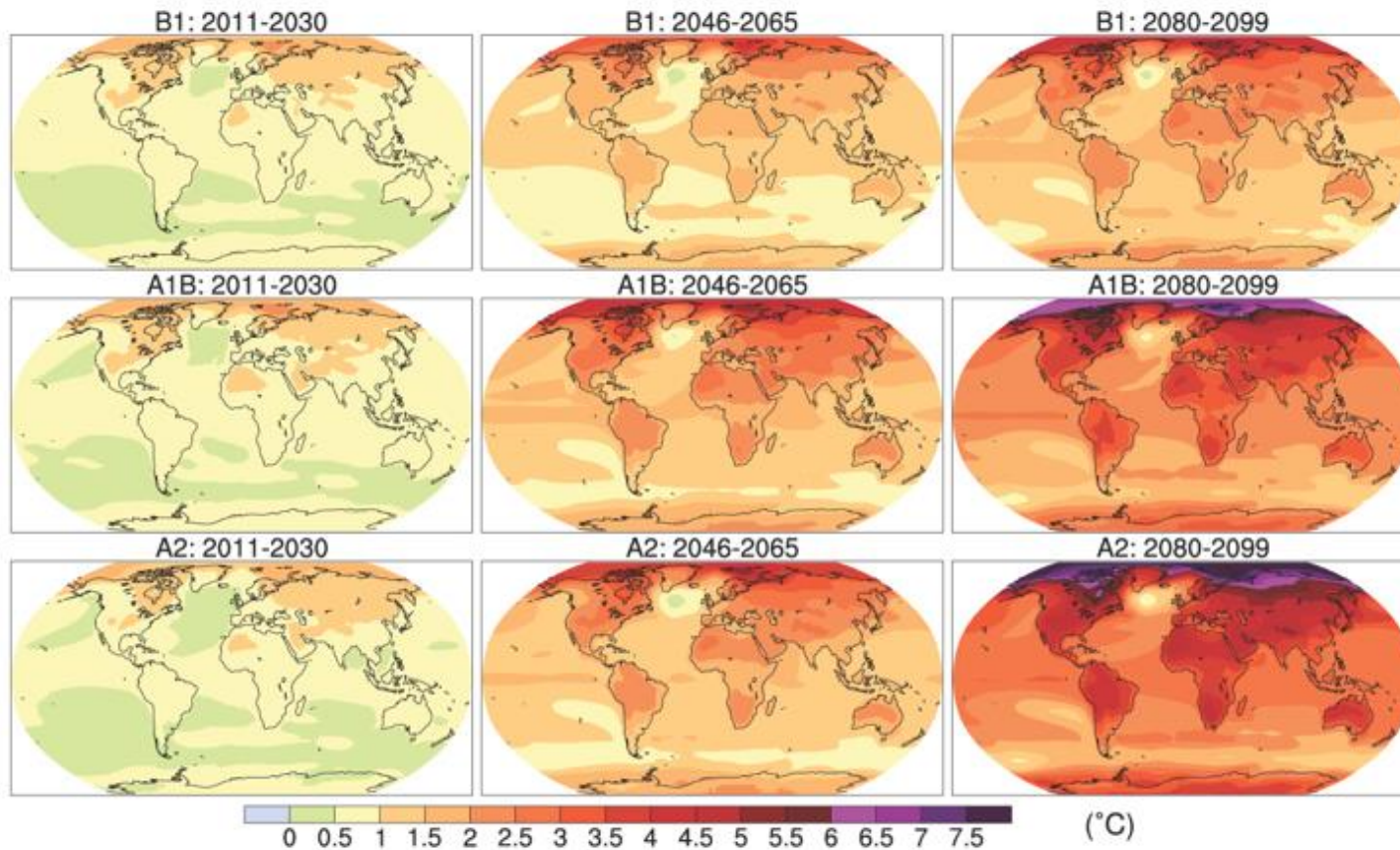
# Climate Change Impacts



# Need for Climate Adaptation



# Global Changes in Temperature

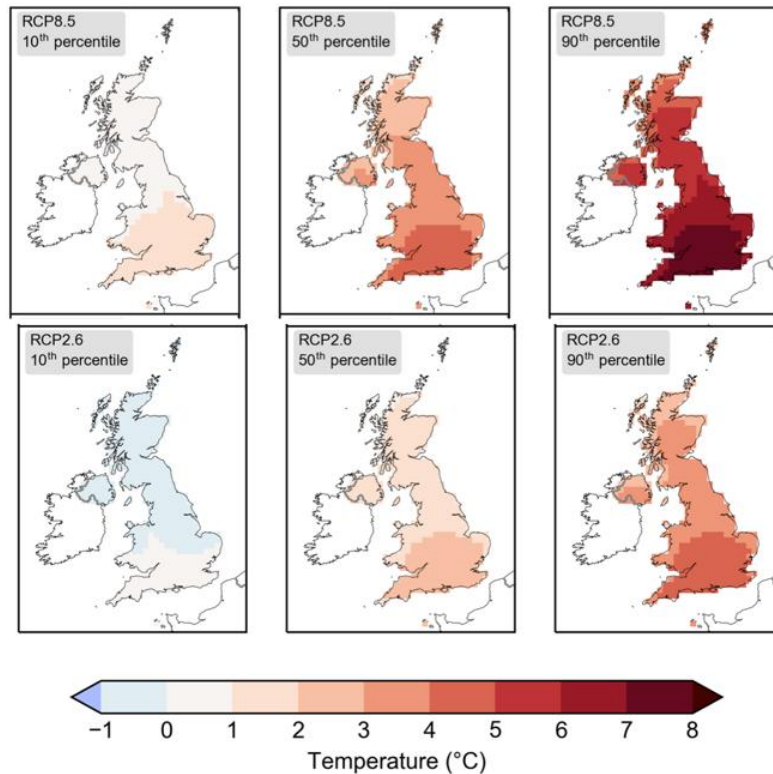


With every increment of global warming, regional changes in mean climate variables and extremes become more widespread and pronounced.

**Note:** B1 – low, A1B – medium, A2 high emissions scenarios

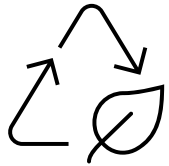
# UK Climate Projections

Summer maximum temperature anomaly for  
2060-2079 minus 1981-2000

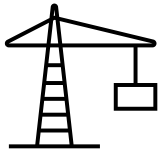


- Warmer, wetter winters
- Hotter, drier summers
- Overall increase in temperature
- Overall increase in extreme events

# Climate Impacts on the Built Environment



Comfort and energy performance



Construction



Managing water



Future energy demand for cooling

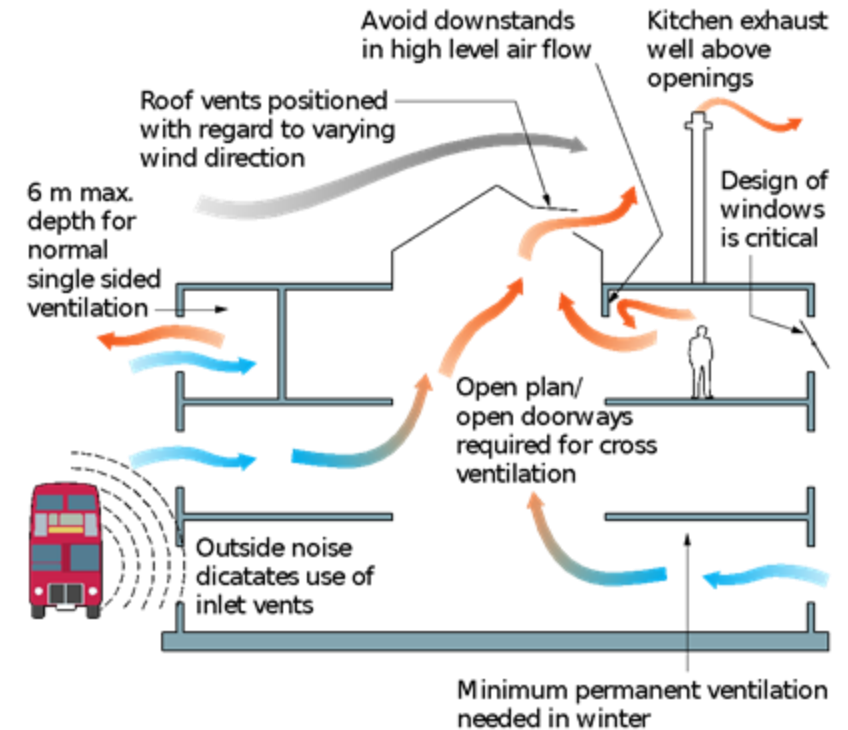
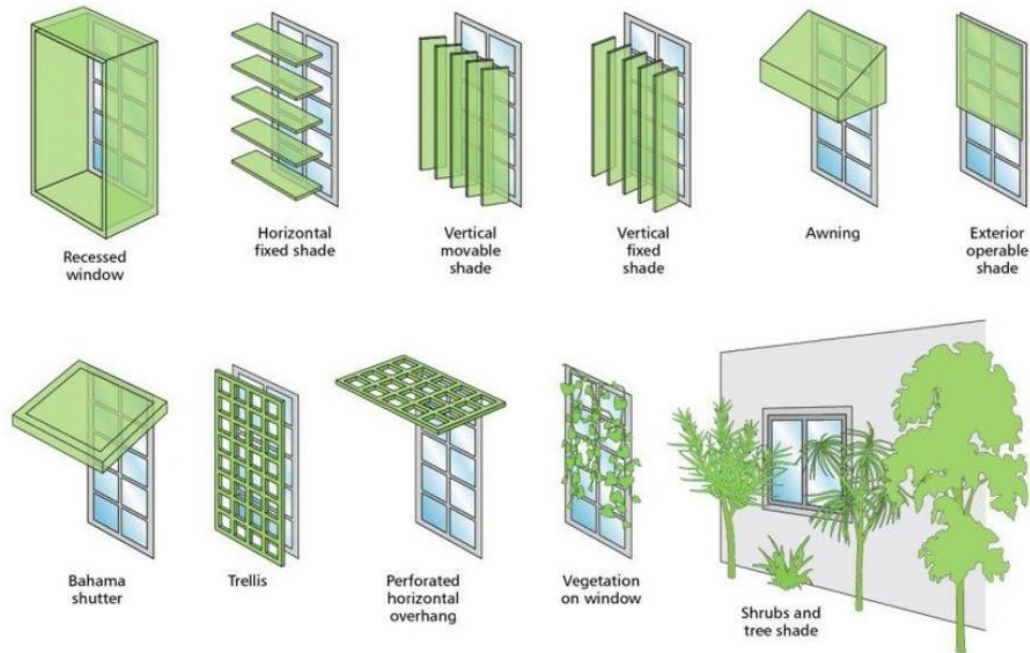


# Overheating risk

- Climate Change
- Urban Heat Island Effect
- City centre locations
- Smaller living and working spaces
- Larger glazing for maximum daylight
- Air tightness for winter energy efficiency
- Noise and/or air pollution limiting natural ventilation
- Increased daytime occupancy (e.g. as a result of Covid-19) and density of occupancy (e.g. in social housing properties)



# Reducing Demand by Passive Measures

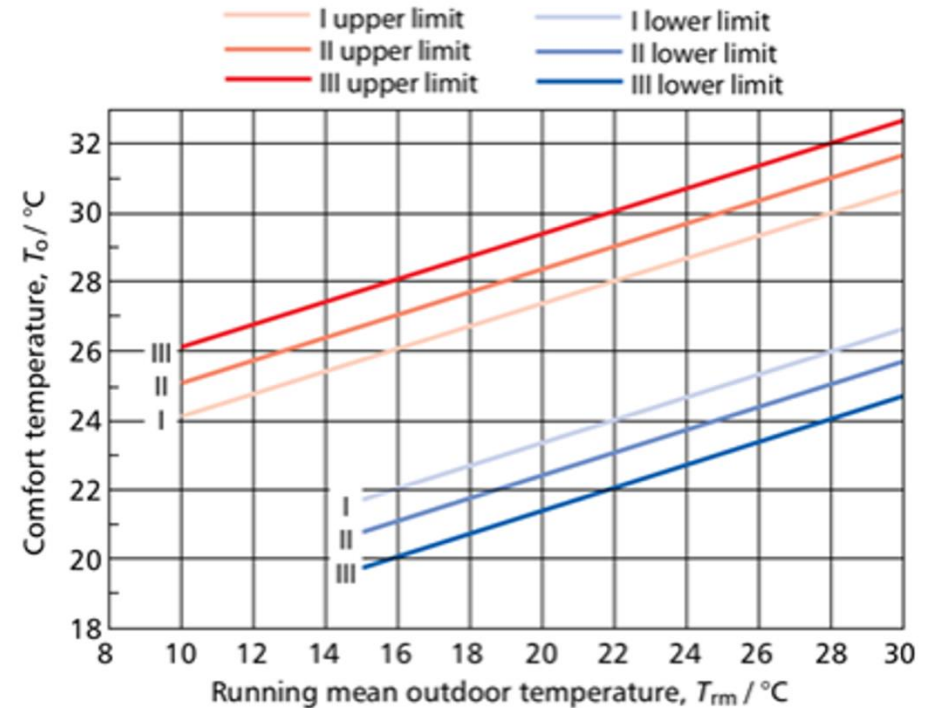


# Meeting demand by green technologies



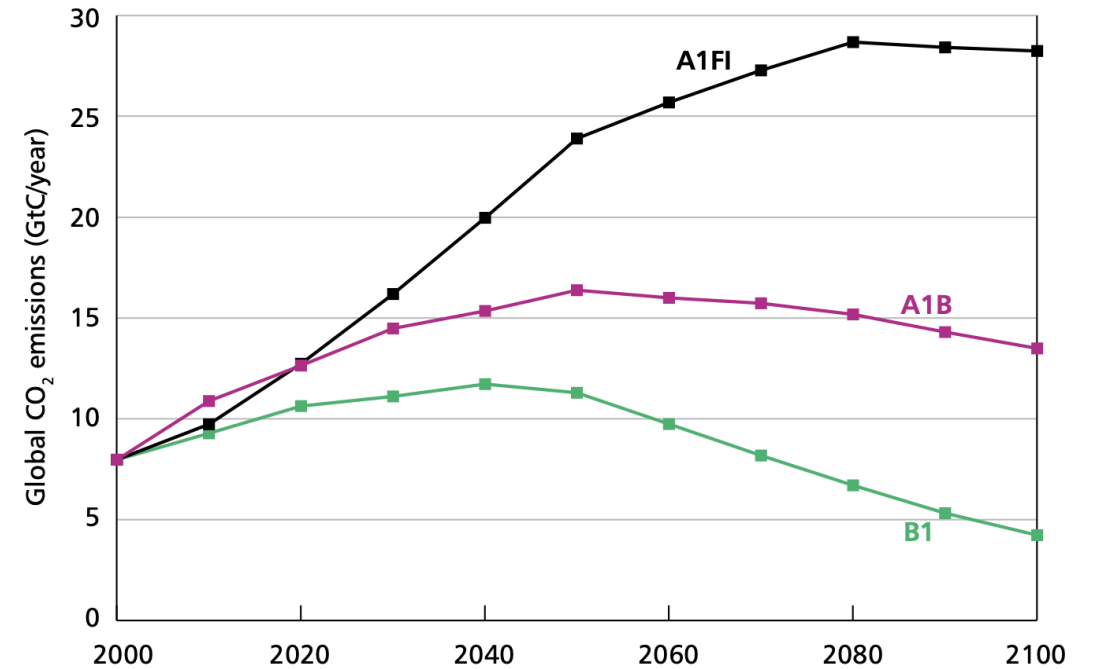
# CIBSE Resources – Adaptive Comfort

Category	Explanation	Suggested acceptable range °C
I	High level of expectation. Also recommended for spaces occupied by very sensitive and fragile persons with special requirements like some disabilities, sick, very young children and elderly persons, to increase accessibility.	+ 2 / - 3 °C
II	Normal expectation	+ 3/-4 °C
III	An acceptable moderate level of expectation	+4/-5 °C
IV	Low level of expectation. This category should only be accepted for a limited part of the year	>+4/ <-5 °C



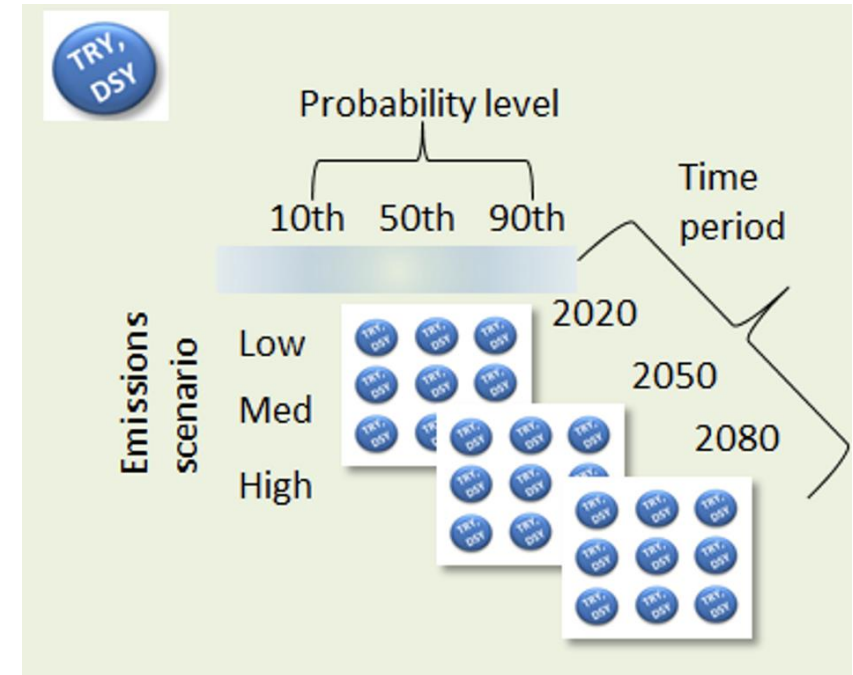
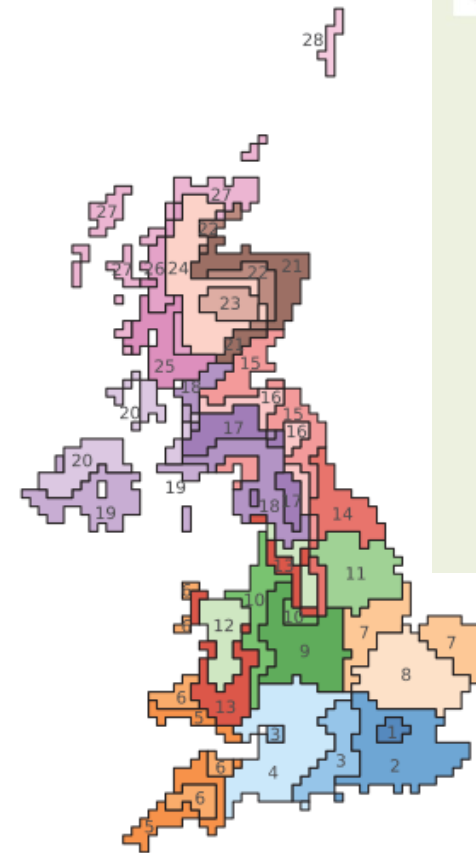
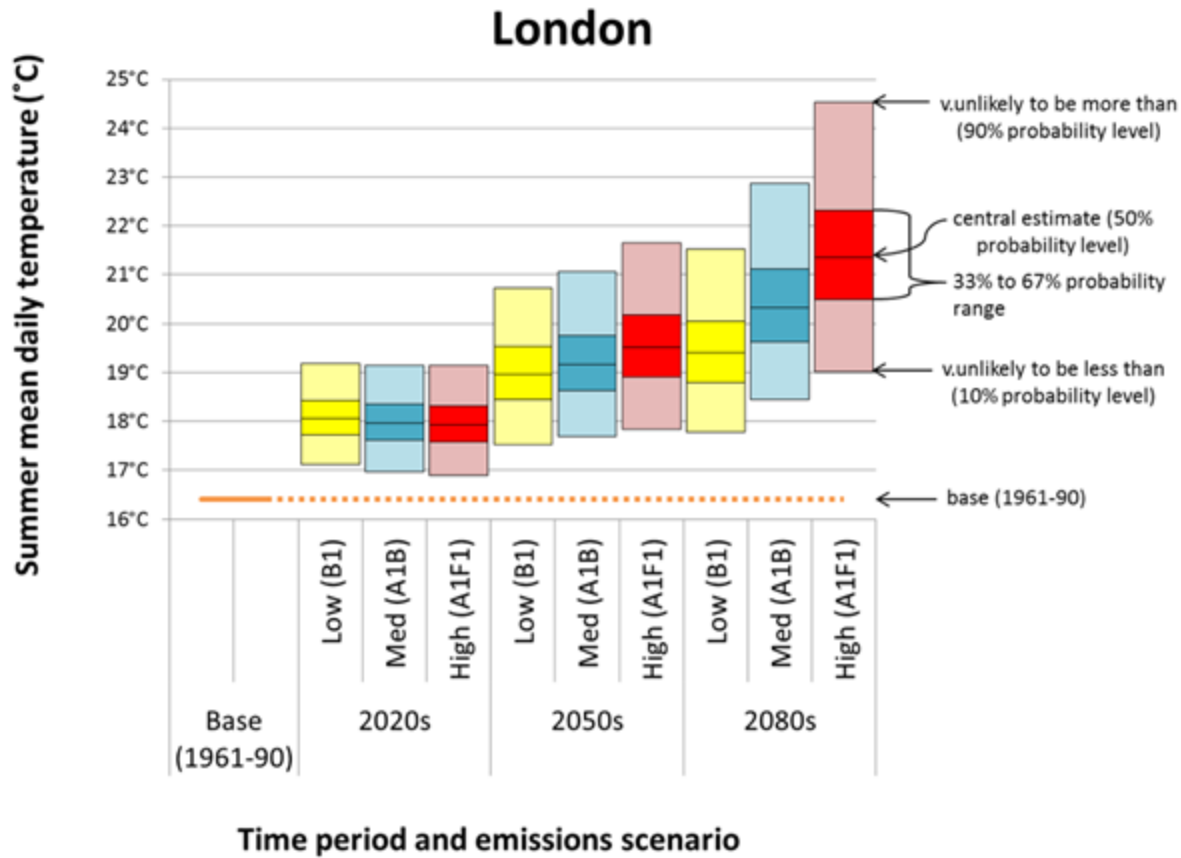
Adaptive comfort – uses the outdoor running mean temperature to calculate indoor comfort temperatures. That allows the consideration of human adaptability to changing conditions (based on the BS EN 15251) and promotes passive solutions.

# UK Climate Projections



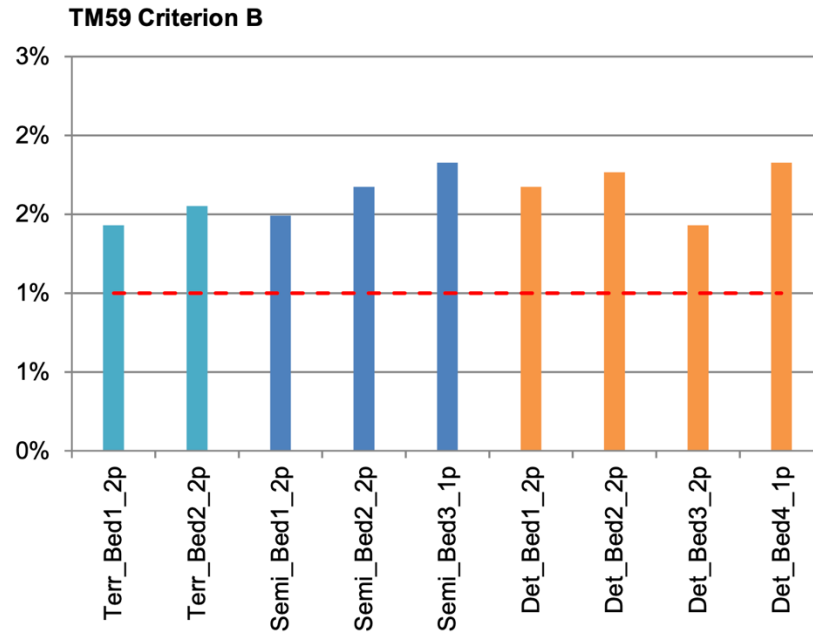
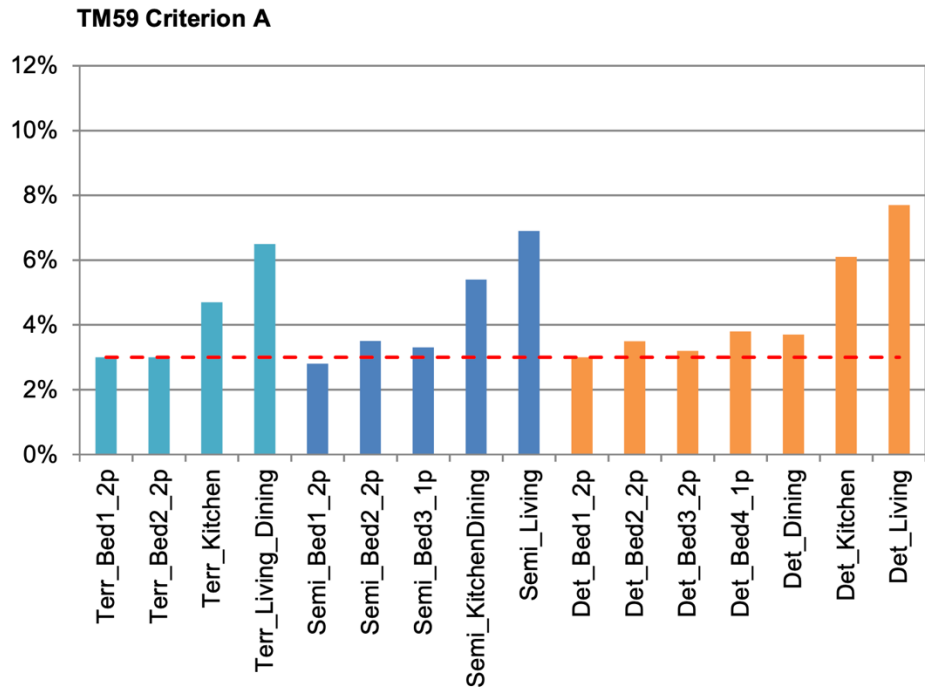
**Figure 1** The IPCC low (B1), medium (A1B) and high (A1FI) emissions scenarios as used in the UKCP09 climate projections

# CIBSE Resources - Designing for climate change

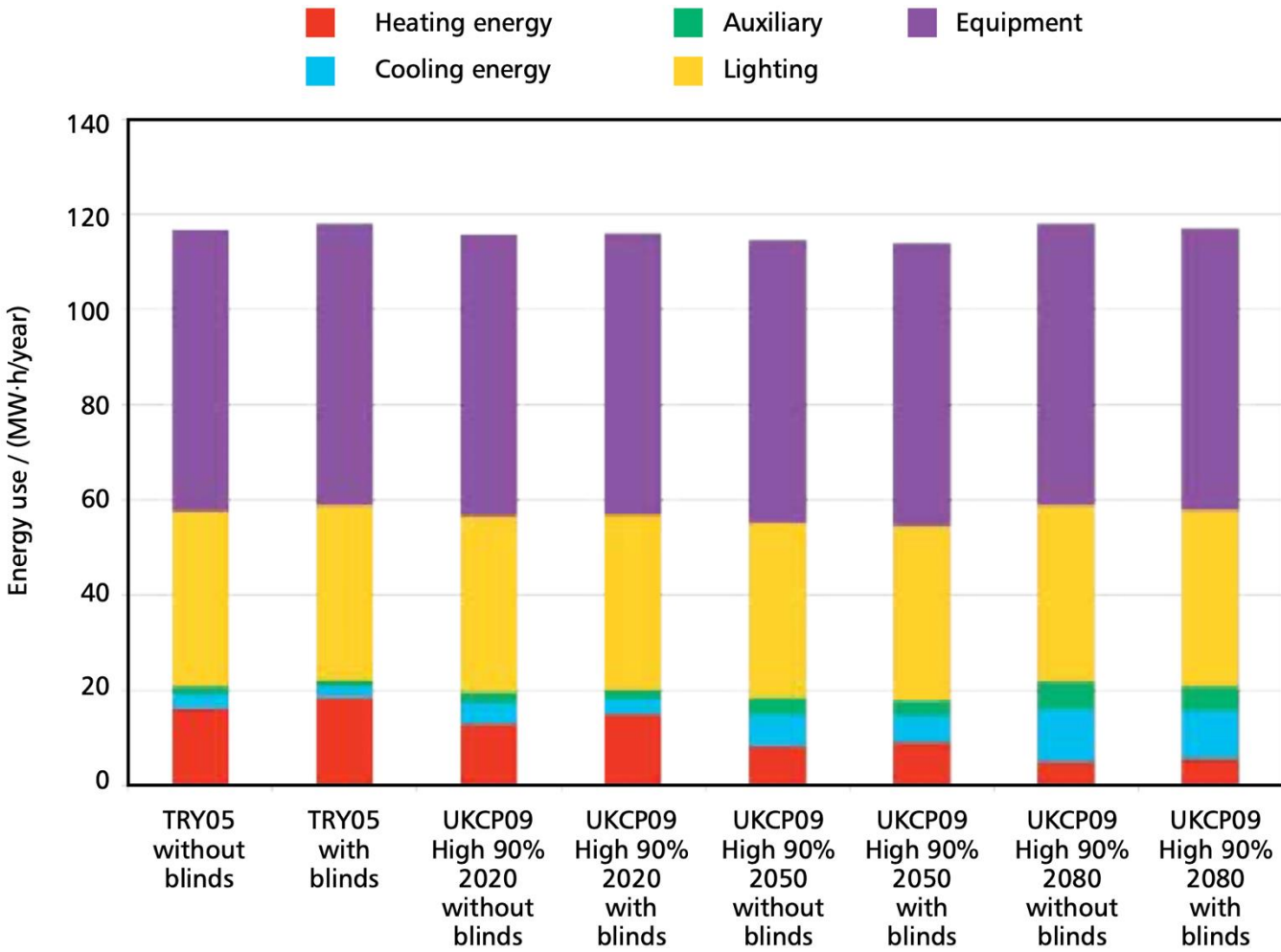


# Overheating assessments

London Centre – modelling results for house typologies in the 2020s (2010-2040)  
(MHCLG report - Research into overheating in new homes)



# Energy assessments



Annual building system energy use for different scenarios on a typical office floor.  
(CIBSE TM55: Design for future climate: case studies)



# Summary

- Increase resilience to unavoidable changes in climate
- Align adaptation and resilience with our decarbonisation efforts
- Plan to meet energy demand for cooling by passive measures and green technologies



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# THANK YOU! Q & A

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