

# Building Regulation Part O Event

## Occupant and design perspectives.

IMOGEN CHRISTODOULOU

A CONVERSATION WITH  
CIBSE HVAC SYSTEMS GROUP



# Presentation Outline.

- Occupant perspectives on overheating risk
- Early planning
- Sources of overheating
- Ventilation & window design
- Shading options
- Summary

## Overheating

APPROVED DOCUMENT



**Requirement O1: Overheating mitigation**

**Regulations: 40B**

# The challenge.



Human  
Centric



Planet-  
Conscious

**Occupants health and wellbeing  
must come first.**



## Overheating can kill!

The number of heat-related deaths is likely to increase to:

7,000 /year by 2050

Equivalent to:

4x road traffic fatalities / year



## Overheating will have a detrimental impact on sleep.

- Hotter nights will affect our sleeping patterns.
- By 2050 climate change could reduce our sleep, on average, by:

30 minutes/ night

(Source: Night time temperature and human sleep loss in a changing climate, Obradovich, 2017)



# Who are we designing for? And what do they want?



# New Priorities.

Healthy environment

Comfort expectations

Work-life merge

Flexibility

Access to nature





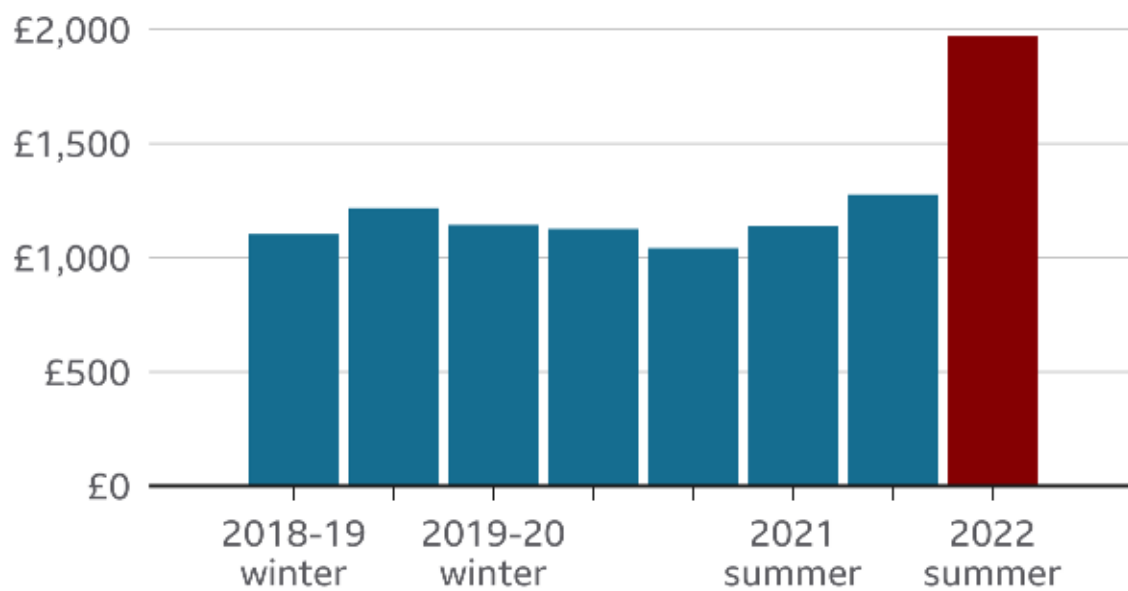
# Key Challenges

- Rising temperatures
- Rising energy prices
- Increased home working



## The energy price cap has risen by nearly £700

Annual bill for a typical household on a price capped dual-fuel tariff paying by direct debit



Source: Ofgem

Met Office

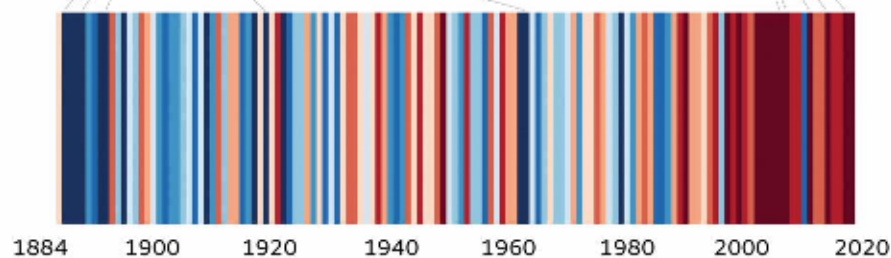
## UK annual temperature

5 coolest years

1892, 1888, 1885, 1963, 1919

5 warmest years

2014, 2006, 2011, 2007, 2017



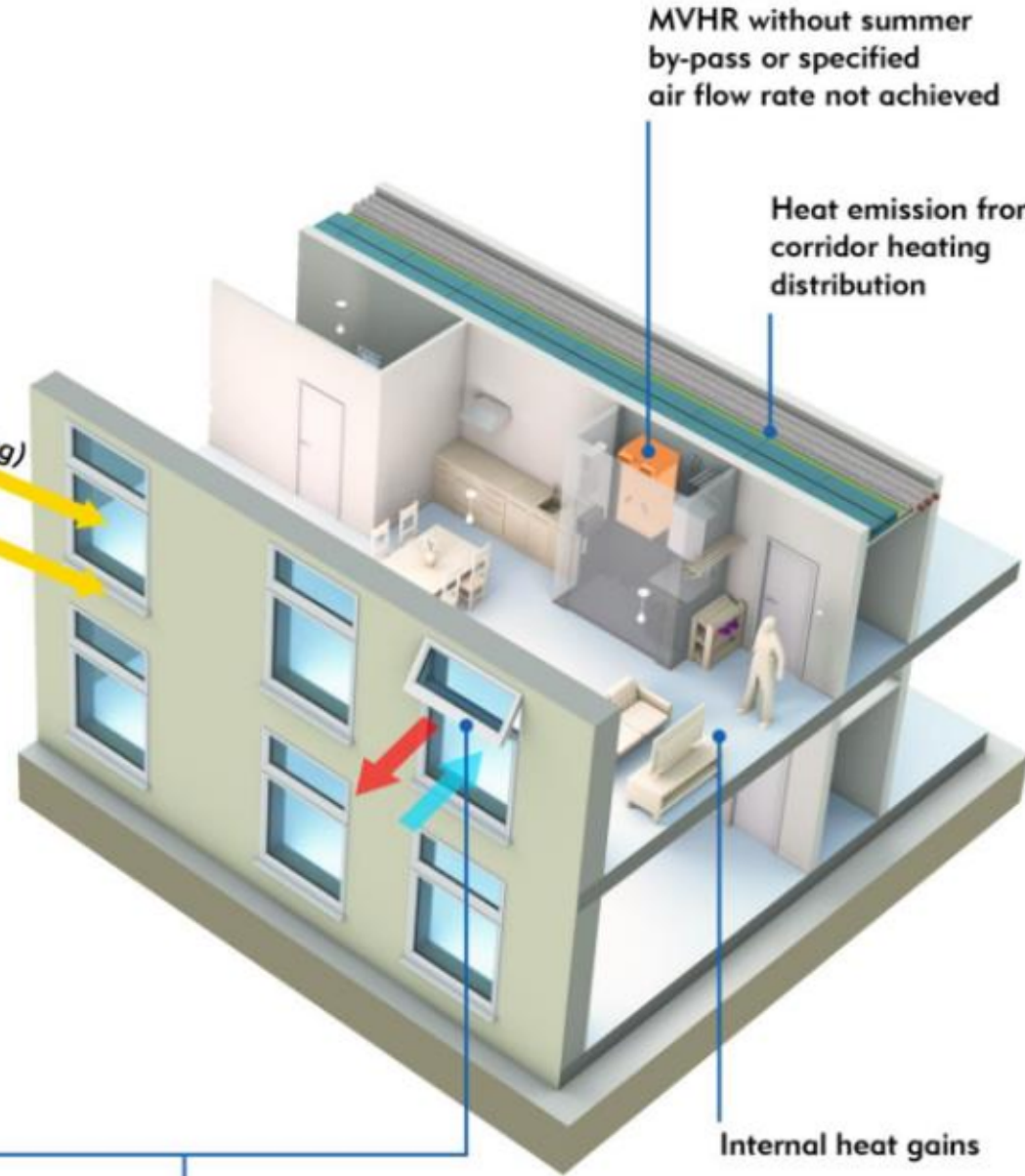
# Causes of overheating



Solar gains through glazing (no shading)  
Heat transmission through fabric



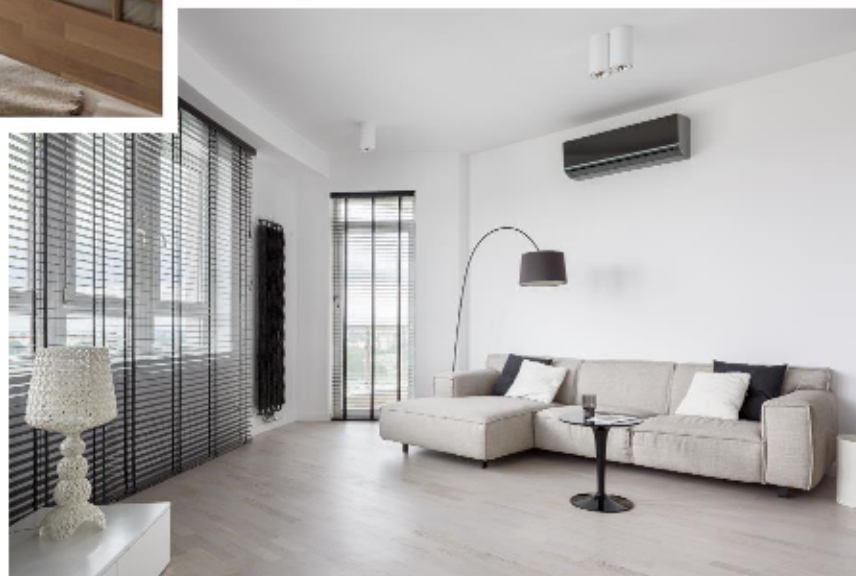
External noise becomes a nuisance for occupants when opening windows



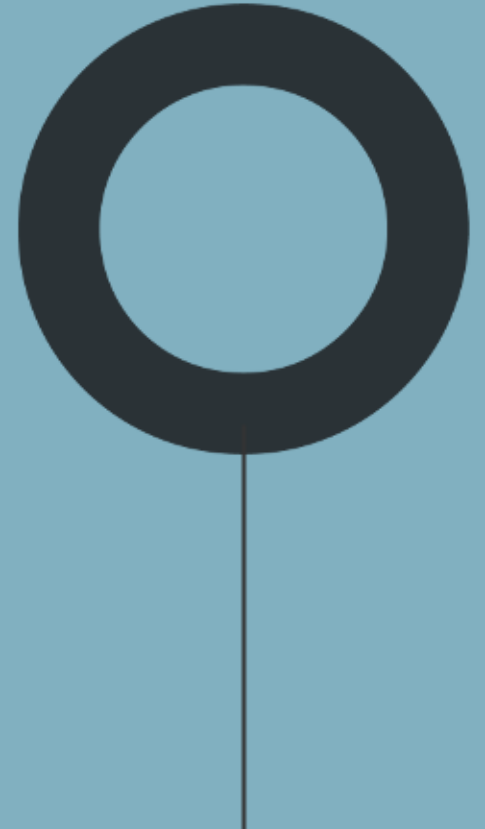
# How might people currently manage overheating?



HOARE LEA 



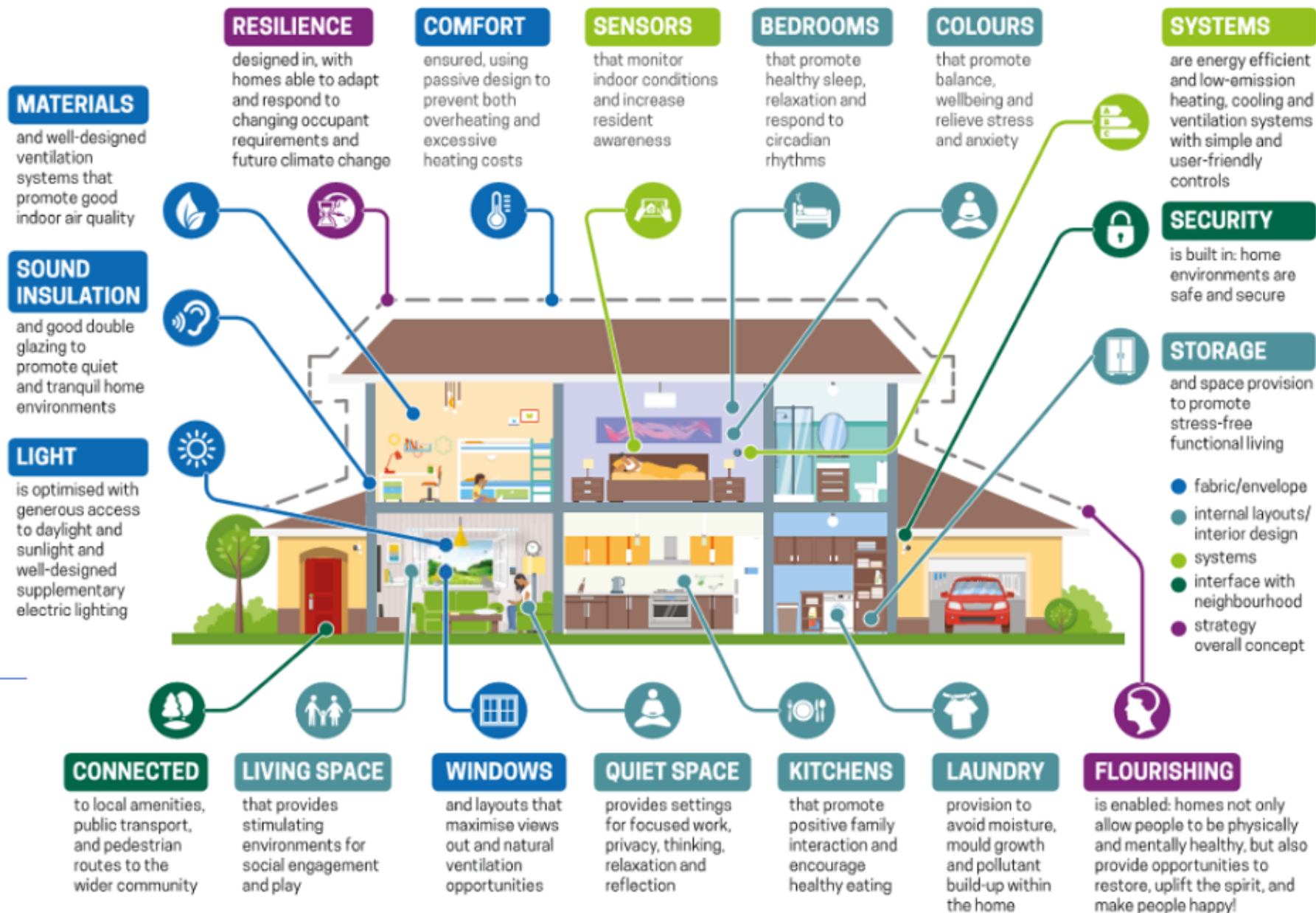
**Early planning is key.**



# Evidence based design.

Health and wellbeing in homes.

UK GREEN BUILDING COUNCIL



# Wellbeing in mixed-use developments. Environmental design tensions.

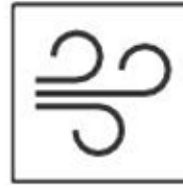
Daylight



Thermal comfort



Air quality



Noise

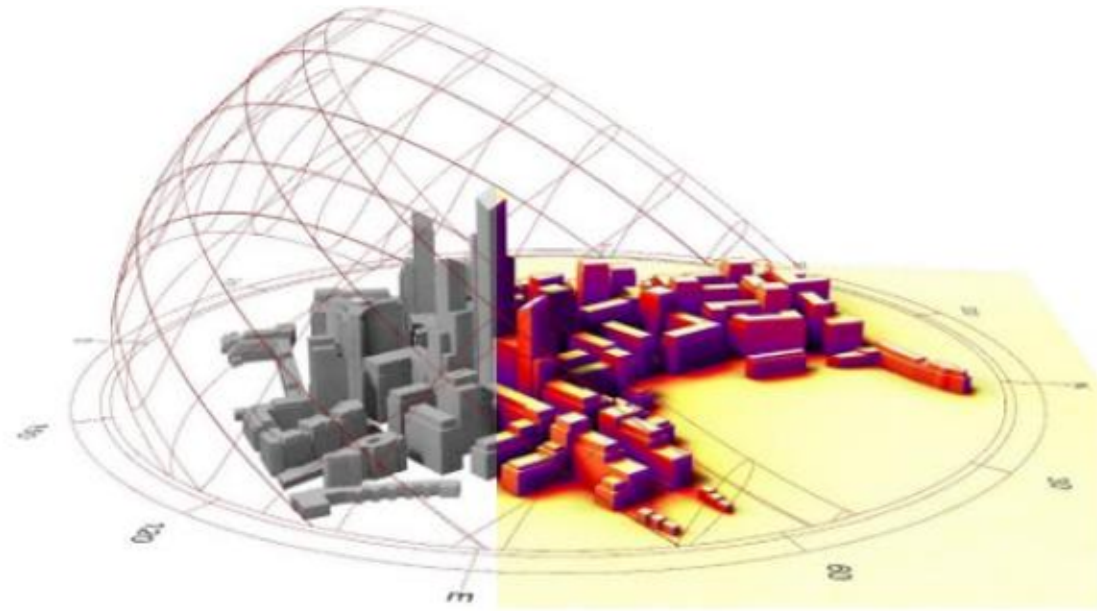
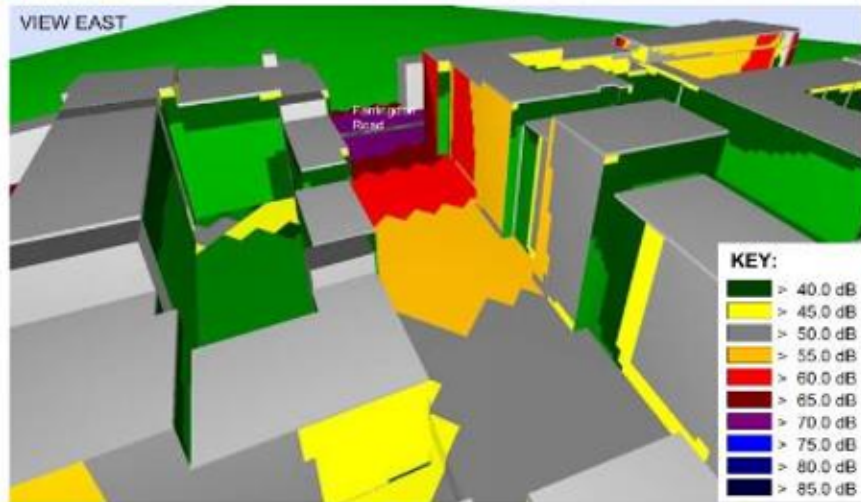
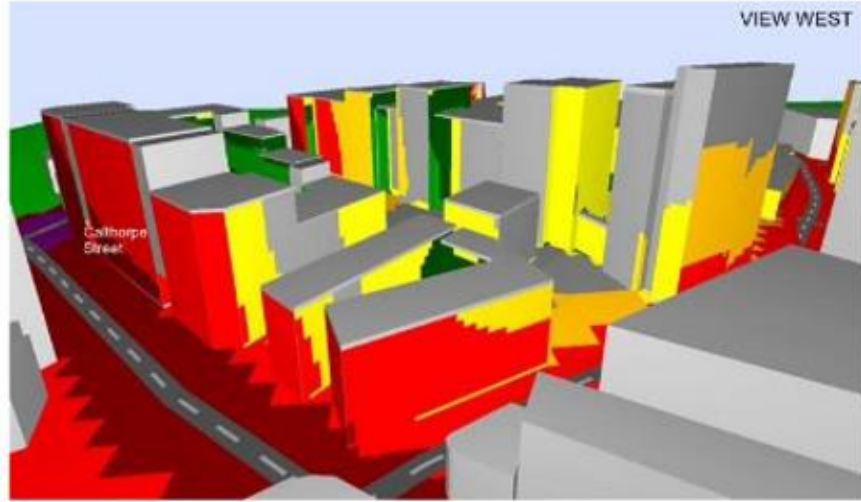


# Early analysis should be used to optimise facade design.





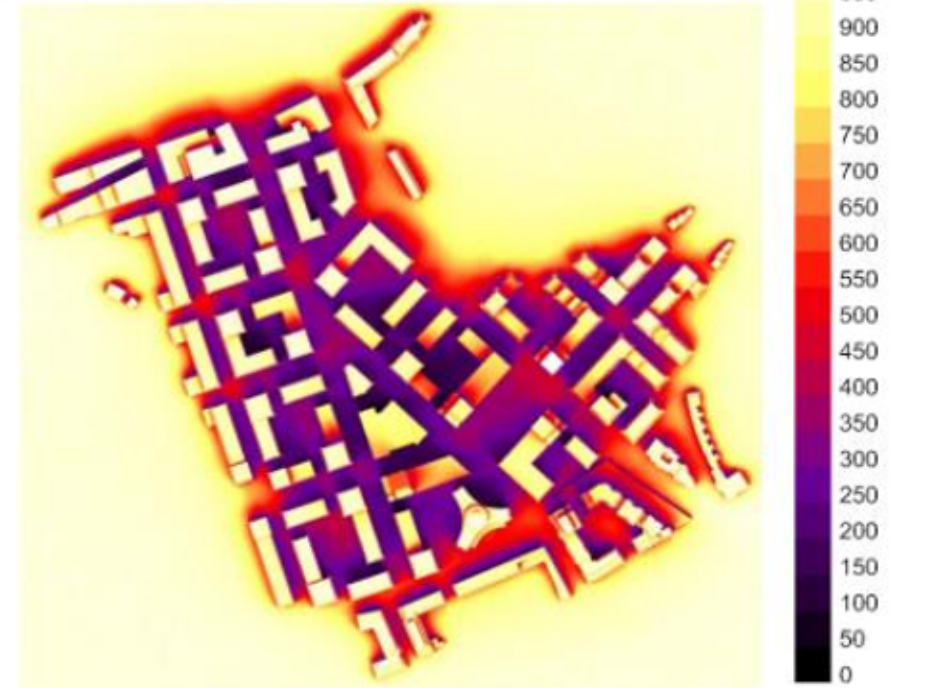
# Site context



NOISE ASSESSMENTS

AIR QUALITY ASSESSMENTS

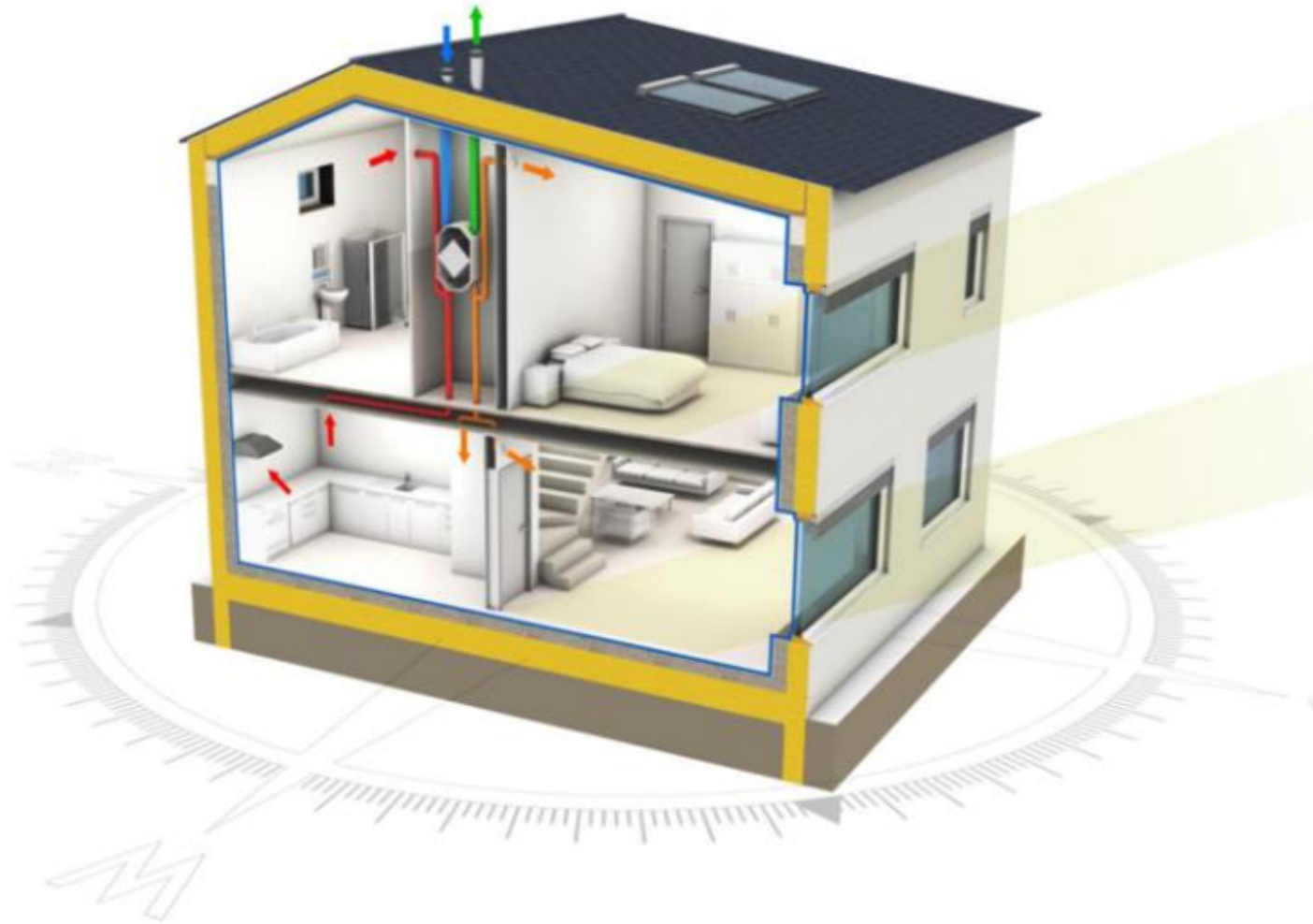
SOLAR ANALYSIS



# Optimising design.

## Early analysis:

- Building form and location.
- Daylight, window and shading strategy.
- Acoustics review.
- Air quality analysis and ventilation strategy.
- External landscaping.





OPTIMISE BUILDING FORM  
AND FABRIC



## Window design needs to consider in-use .



# Shading Devices.

## External Shading



Example of vertical window awnings



Example of window frame shutters



External venetian blinds

# Safety and security.

- Ground floor bedrooms.
  - Fixed or lockable louvred shutters.
  - Fixed or lockable window grilles or railings.
  - Accessibility?
- Safety
  - Top level windows?



# Summary.

- Occupants health and wellbeing is key
- Energy prices are continuing to rise
- Early planning is crucial
- Change to design
- Linked up thinking
- What do occupants want vs what do occupants need

## Overheating

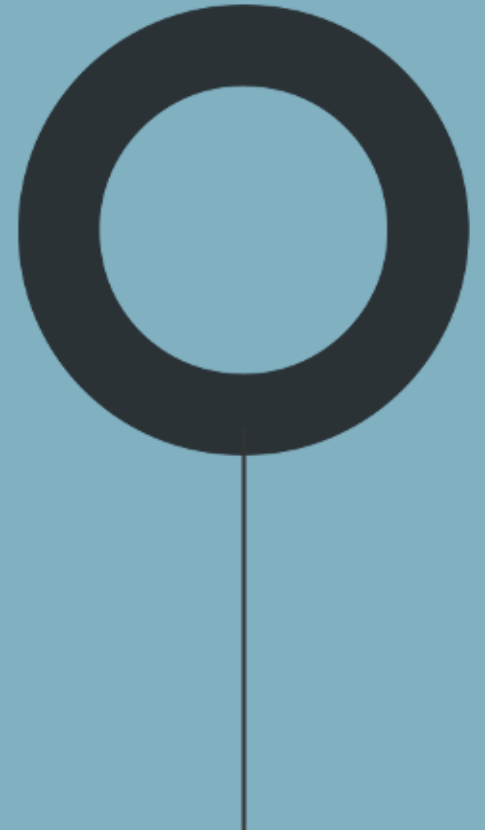


APPROVED DOCUMENT

Requirement O1: Overheating mitigation

Regulations: 40B

# What do occupants want vs what do occupants need.





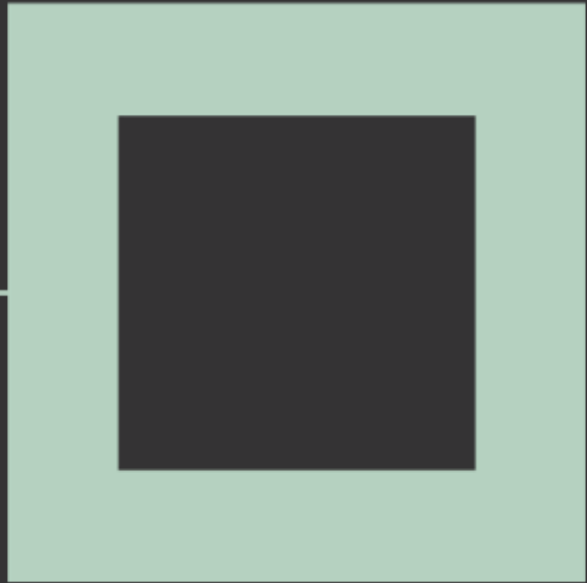
# The challenge.



Human  
Centric



Planet-  
Conscious



**Thank you.**  
**hoarelea.com**

imogenchristodoulou@hoarelea.com