

# Cool Home in a Heat Wave

**For Open Eco Homes 2020 /  
Cambridge Carbon Footprint  
17 June 2020**

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# Cool Home in a Heat Wave



1 – Shading & thermal mass - Margaret

Q & A

2 – Ventilation & insulation – Tom

Poll 2

3 - Avoiding accidental overheating - Tom

4 – Personal cooling - Tom

# Cool Home in a Heat Wave

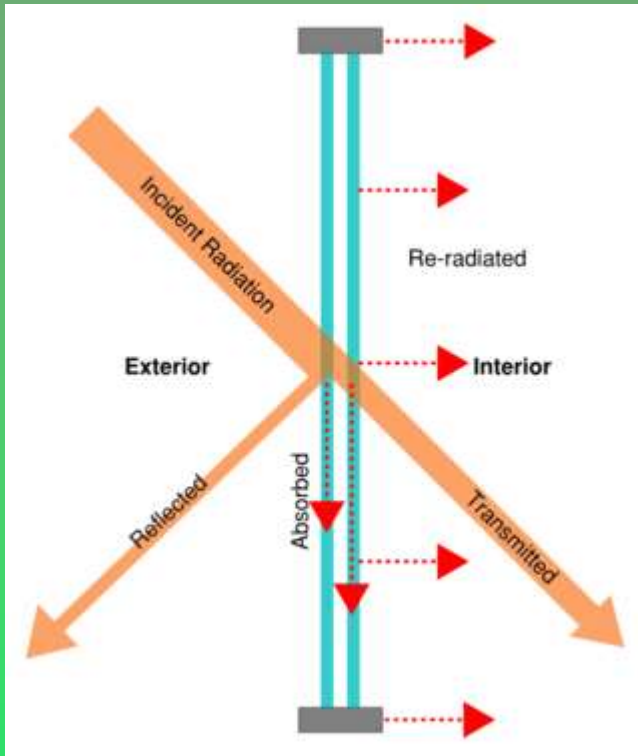
## SHADING - Some BASICS:

- 1 – Materials absorbing heat/ thermal mass
- 2 – Seasonal & daily sun on your house

# Materials and heat

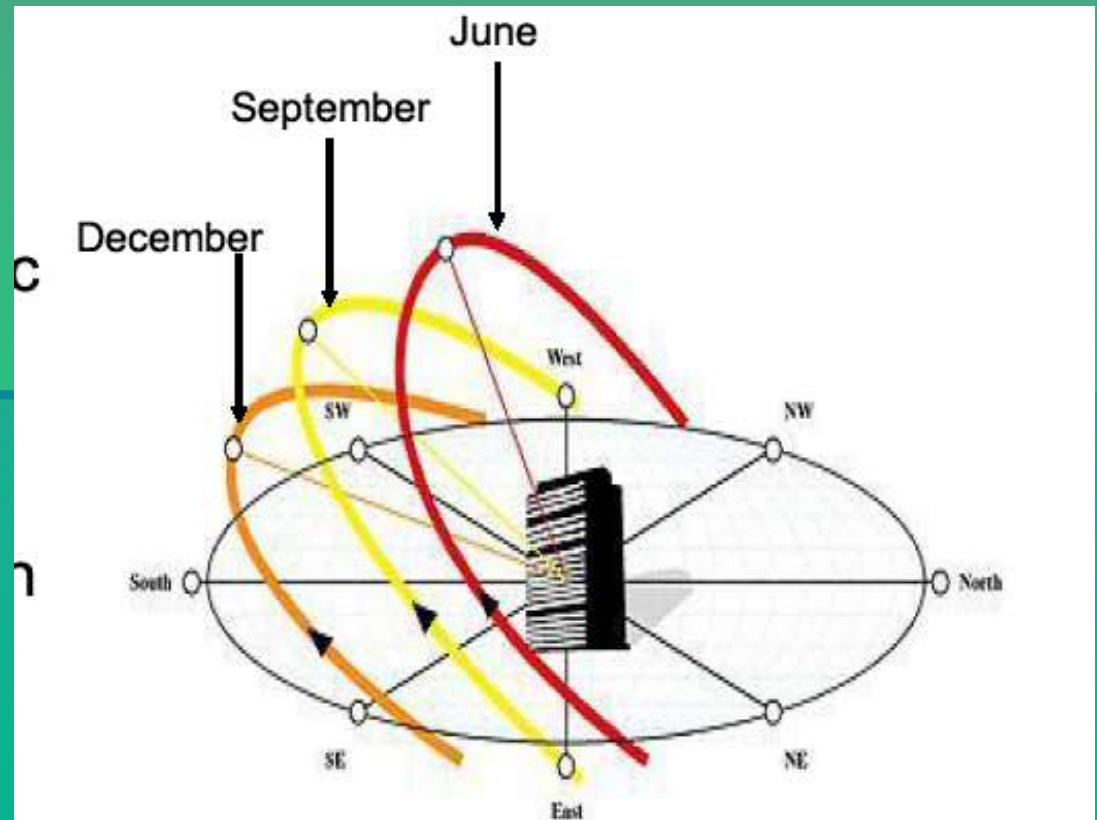
- 1 – Dense materials - concrete, brick, stone - absorb more heat & solar radiation, and they release it slowly. = greater “Thermal Mass”
  - metals absorb and release heat quickly - conductors
- 2 – Insulation foam, & timber generally absorb less heat = have less “Thermal Mass”
- 3 – Glass (even double & triple glazing) transmits heat
- 4 – Surfaces can reflect heat

# Windows & glazed doors



# Sunshine & Daylight

- 1 – To stay cool you need to know which parts of your home receive sun/light and WHEN
- 2 – North exposure shady, East = morning sun, West = afternoon sun, South, sunny
- 3 – You also need to know the outdoor temperature, or at least when it is cooler out than in



Source: [www.colinfo.co.uk](http://www.colinfo.co.uk)



# Internal Shading

## 1 – Roller Shades



## 2 – Blinds: vertical & horizontal



vertical



“closed”

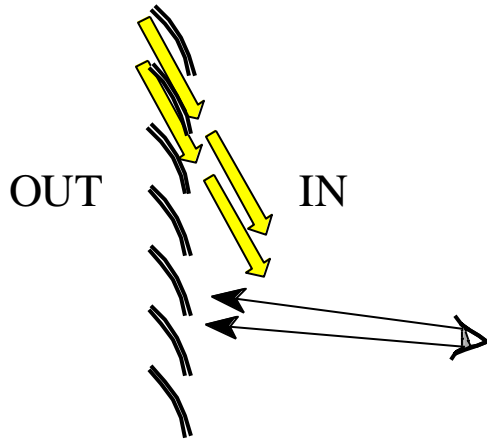


deflecting sun



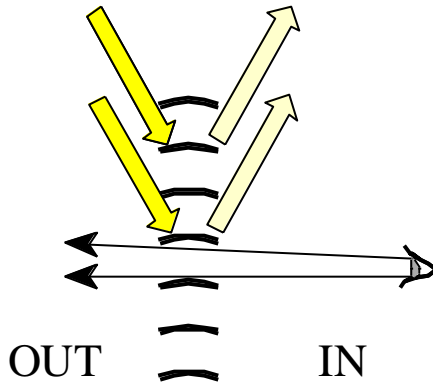
rooflight

# Sun & Horizontal blinds



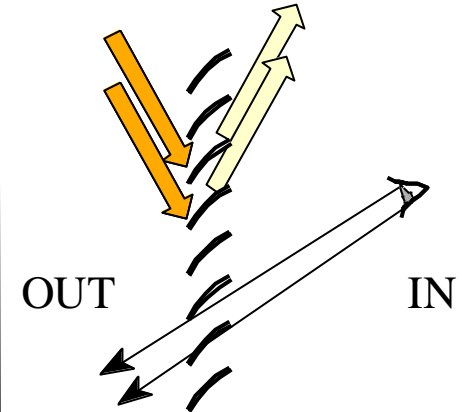
Summer: sun @ 61 deg  
shines in, heats inside surfaces  
No view out

**Blinds “closed”**



Summer: sun @ 61 deg  
Some reflected light  
View out

**Blinds horizontal**



Summer: sun @ 61 deg  
Sun blocked  
Only reflected light  
Some view out

**Blinds to block sun**



# Cool Home in a Heat Wave

## SHADING – Internal & External



VIDEO

# External shading – slats & shutters



## SOLAR SHADING

Secure shutters and inward opening window on the south facade provide rapid ventilation and solar shading.

solar shading blinds



# External shading - rooflights

External awning blind transmits 4% - 14% of heat



Velux, installed 2010

Fakro, installed 2020:  
Put in place for  
summer season

Figure 3: Window with awning blind (depending on the fabric used)  $g = 4-14\%$  (0.04—0.14) as per EN 13363-1



Figure 1



Figure 2



Figure 3



# Fabric shades & sails



**Bronwen Barry Archt**



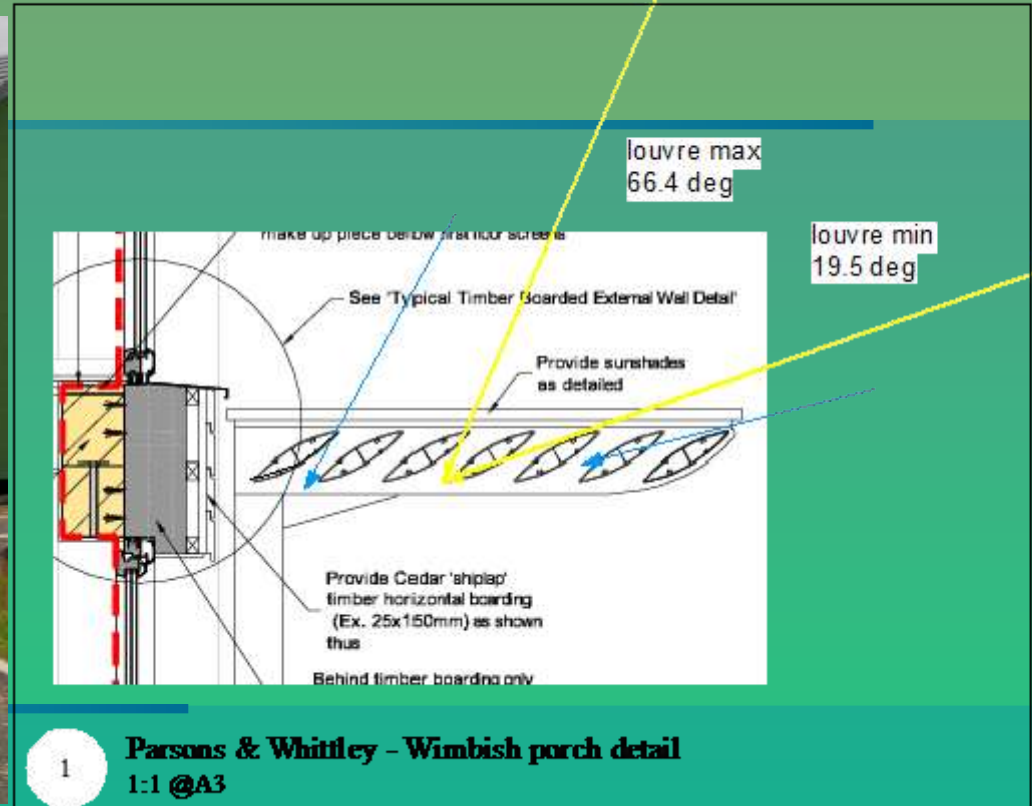
**Harry Paticas, Archt**



**Bamboo roller screen**



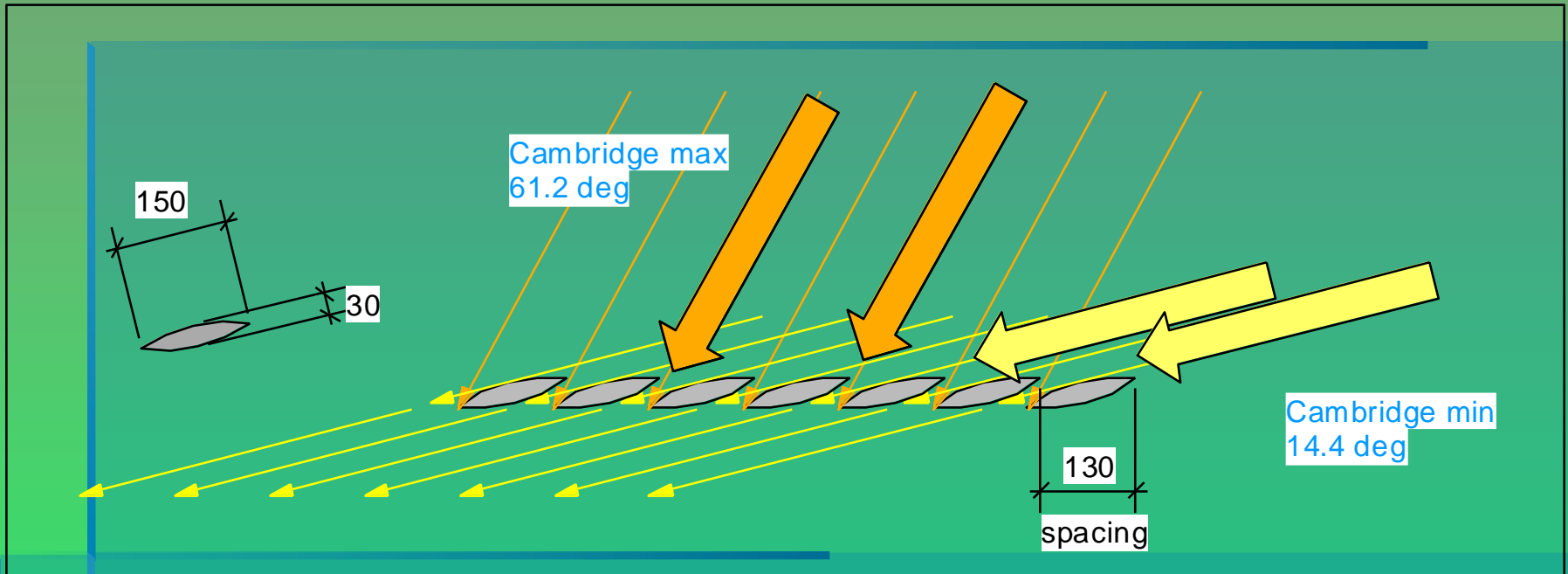
# Solar louvres – Wimbish PH



## Wimbish Passiv Haus – porch louvres

[https://passivhaustrust.org.uk/UserFiles/File/Projects/Awards2012/Presentations/2012UKPHAwards\\_Wimbish.pdf](https://passivhaustrust.org.uk/UserFiles/File/Projects/Awards2012/Presentations/2012UKPHAwards_Wimbish.pdf)

# Solar louvres for Cambridge





# Electronic external blinds



**Denby Dale Passiv Haus**



# Cool Home in a Heat Wave



## 1 – Shading –Summary

- When and where is the sun?
- Internal shading
- External shading

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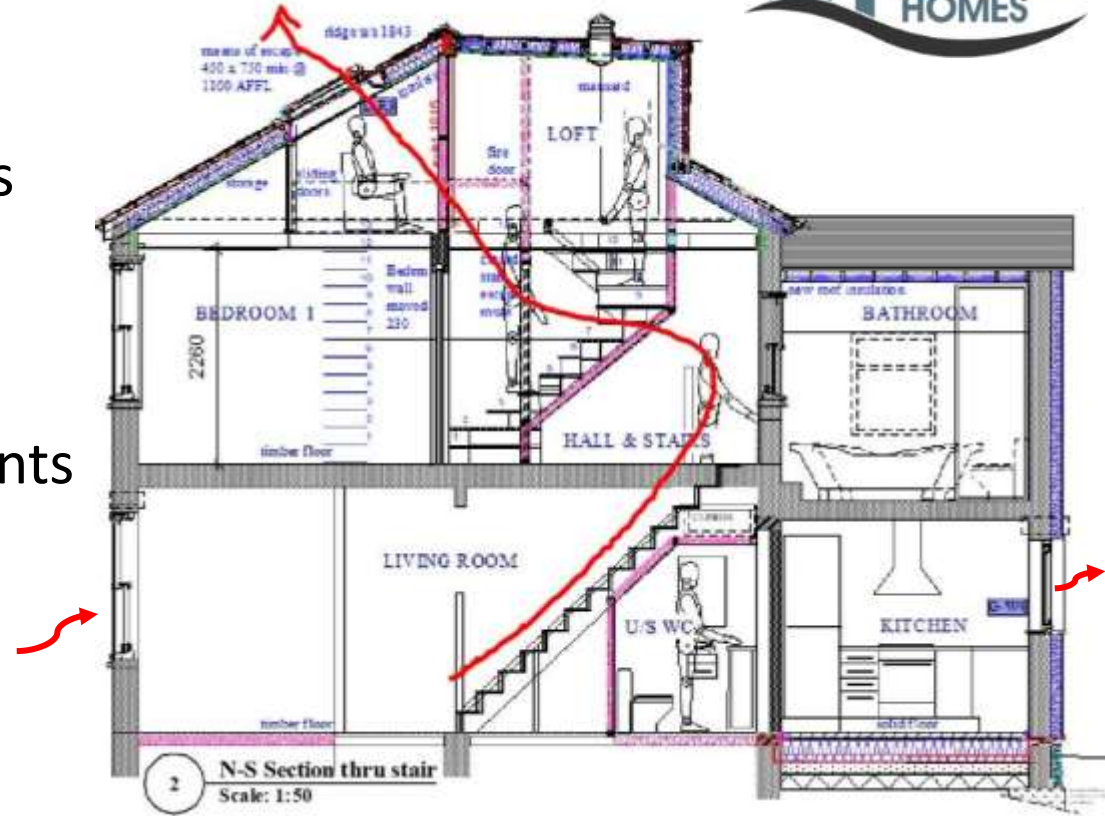
# Ventilation

## When it's Hot outside:

shut doors, windows & vents  
- if they let in hot air

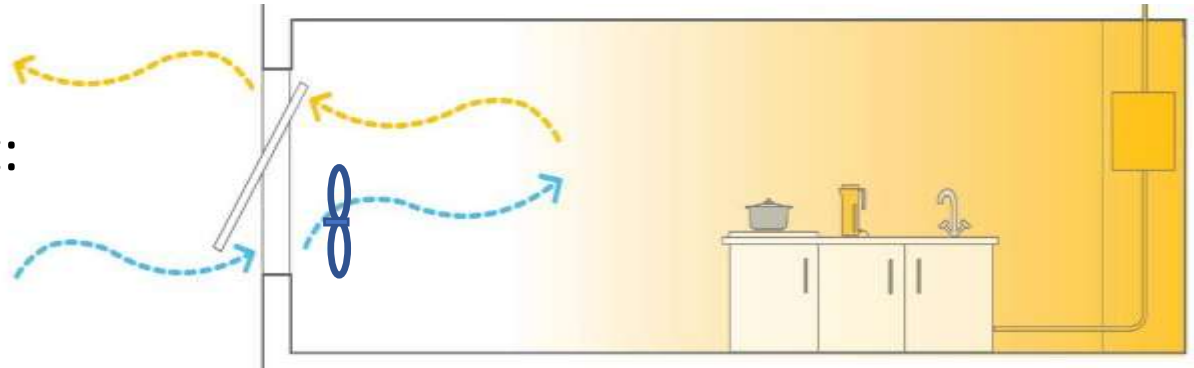
## When it's cool outside:

Open windows, skylights, vents  
at bottom & top of house  
or across your home



for a single-aspect flat:

a fan may help



# Security for Night Cooling

Look for Secured By Design



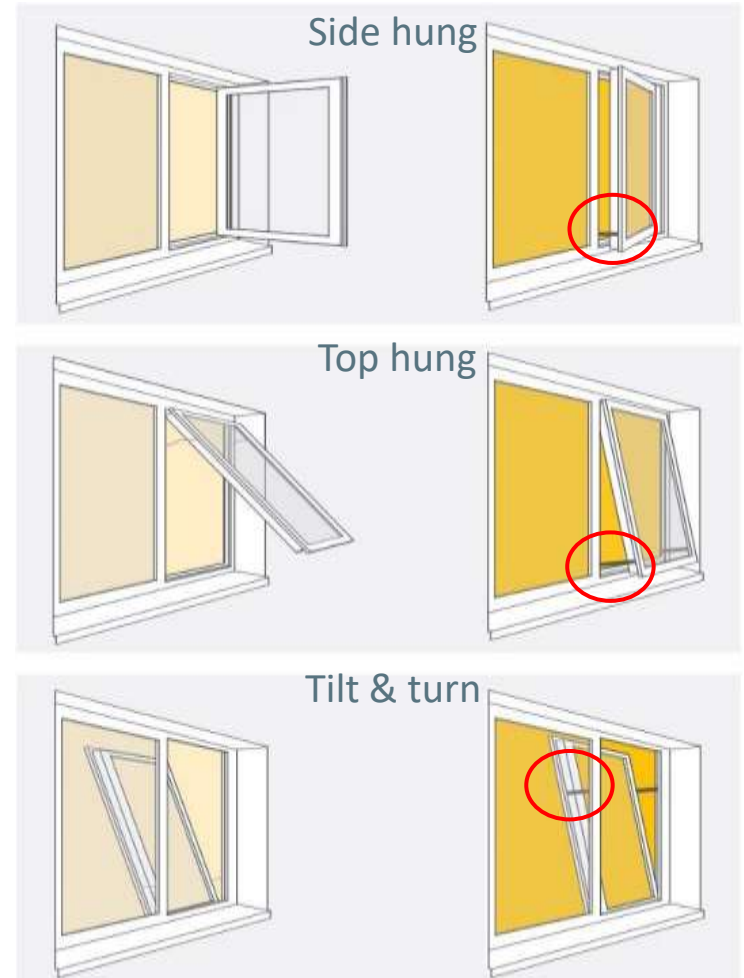
Ventlock for Sash windows



Do you have a problem with external noise or pollution?

**Poll**

**Secure:**





# Insulation

Lofts, Roofs, Walls

Hot pipes, tanks

Slate roof surface  
at 74.4°C



Multifoil  
insulation





# Thermal mass

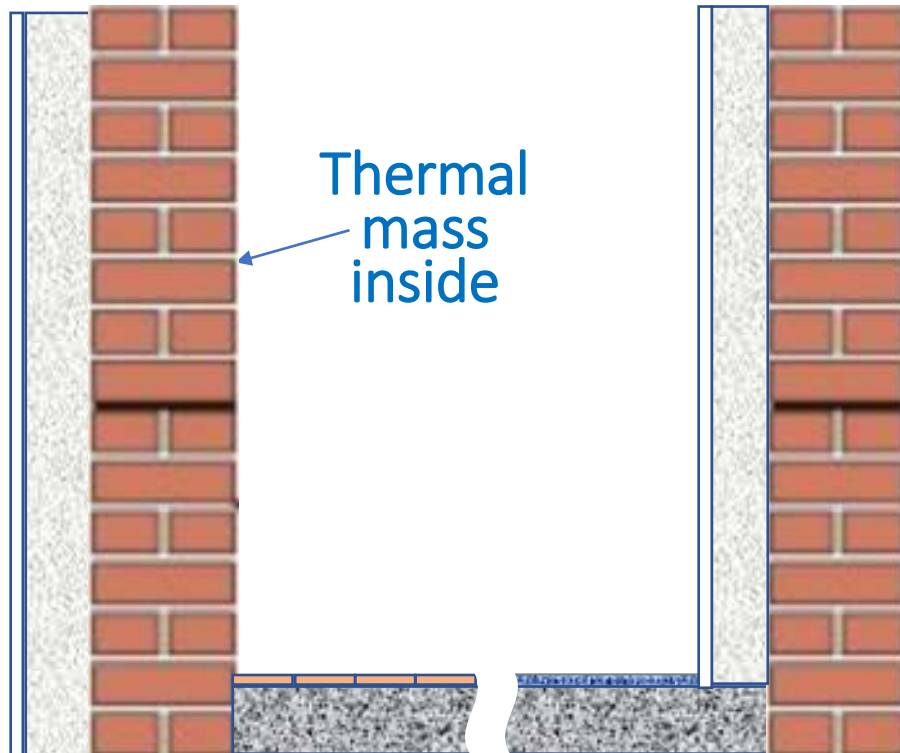
Brick, stone, concrete  
Steadies the temperature



## Solid Wall Insulation

External

Internal



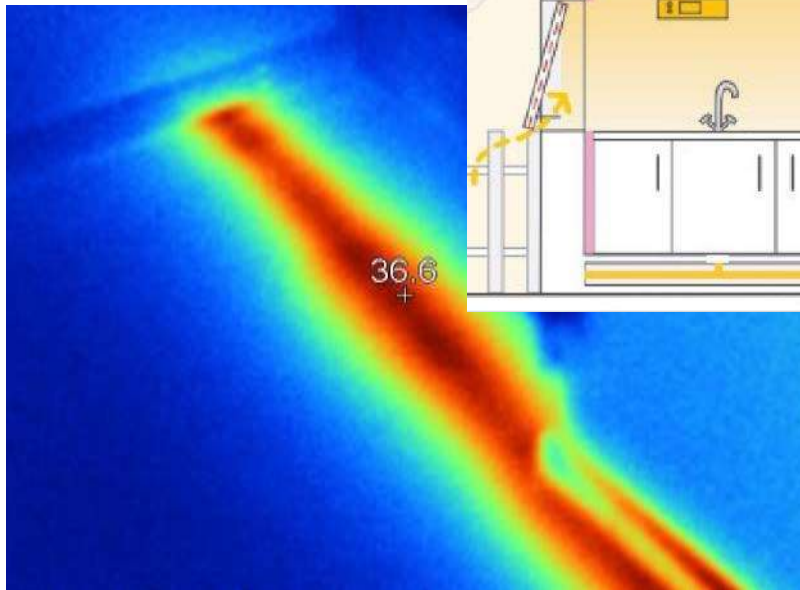
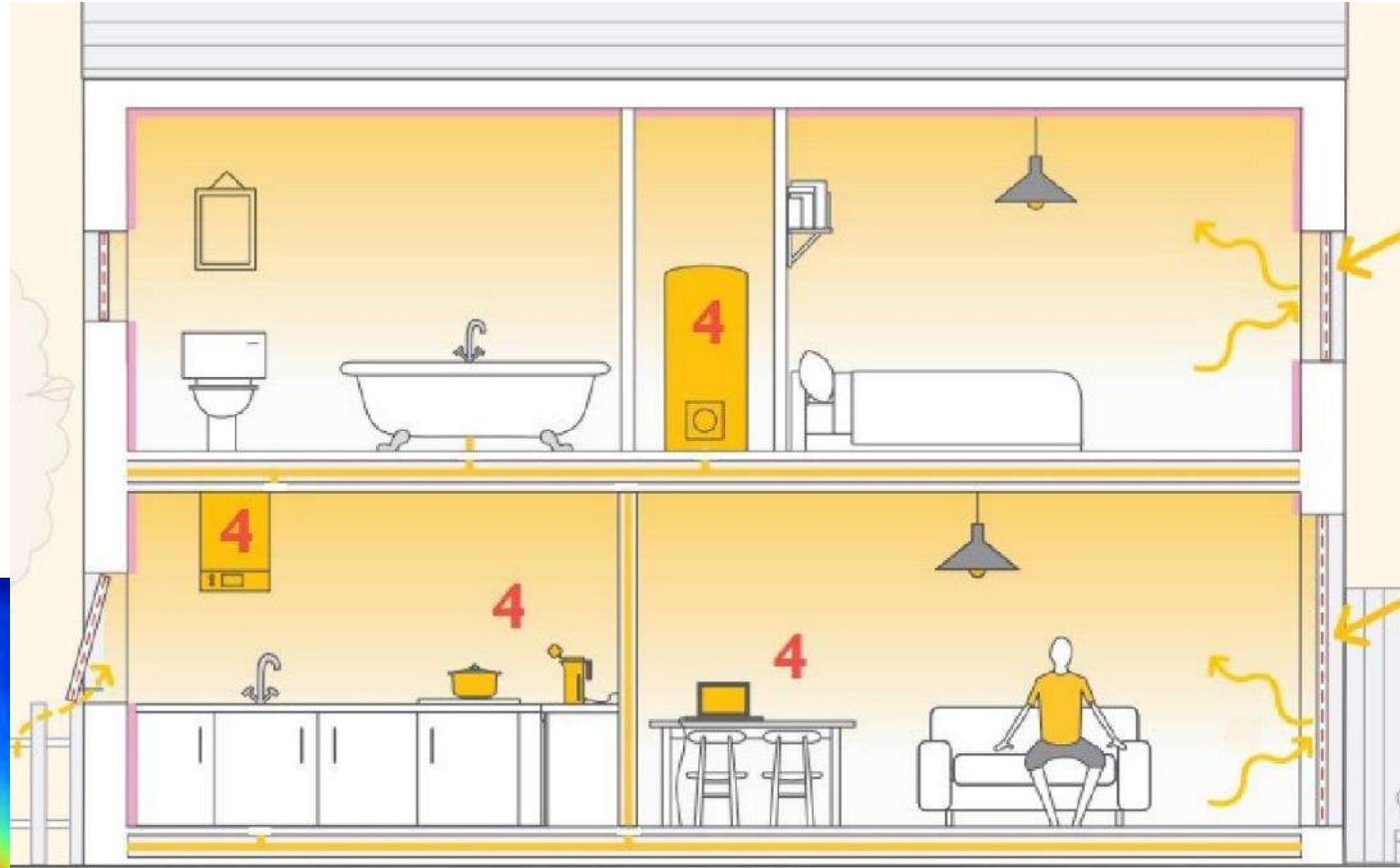
## External Surfaces

48.3°C 7.5°C cooler



# Accidental Heating

What's  
missing?



# Efficient appliances & Tech

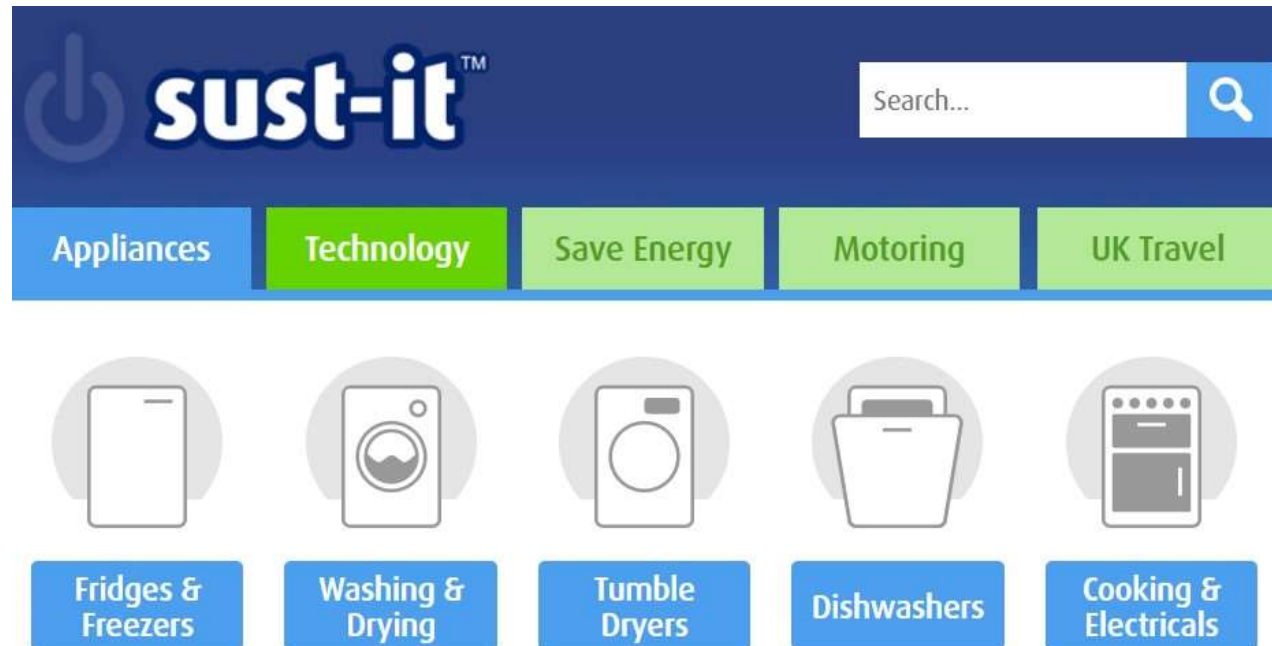


## Energy labels



and switch them off  
when not in use....

Find efficient  
appliances & Tech



# Personal Cooling



- drinks, cool showers, fans, spray
- loose, light clothes
- 'hot' water-bottle in the freezer
- consider sleeping where it's cooler
- beware [heat exhaustion/ heatstroke](#)
- avoid going out, exertion at midday
- look out for your neighbours:  
old, young, vulnerable





# Mark Brinkley's self-build



Tues 23<sup>rd</sup> June 6:30-7:30pm - Free Registration



- low G glass to avoid summer overheating
- MVHR for filtered fresh air: auto summer bypass
- 3.5 kW PV : excess electricity to hot water heating
- Low Energy Building Standard – “Passivhaus-lite”

# More Online tours

Sept - Oct



## More Webinars soon:

Better Insulation  
Heat pumps

Thermal Imaging training, loans : Autumn??

Resources:

[Staying Cool in a Heatwave](#)

[How to Keep Cool in Summer](#)

CCF online resource

Transition Cambridge

# Enjoy the hot weather



Pls write in Chat: something good & something to improve

Donations: [cambridgecarbonfootprint.org/donate](https://cambridgecarbonfootprint.org/donate)

Thanks for taking part,

Tom Bragg  
Margaret Reynolds

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