Future needs of housing to adapt to the climate change public health threat

Homes and Health Webinar Series
Planning Healthy Homes and Communities
20th January 2022

Dr Julie Godefroy
Sustainability consultant & CIBSE Head of Sustainability

UK health
& the built environment

UN Sustainable Development Goals
How is the UK doing?

« *Ensure healthy lives and promote well-being for all at all ages* »

13 targets, from healthcare services to prevention

2018 SDG UK progress report: 

Estimated 40,000 premature deaths attributable to **outdoor air pollution** each year

Life expectancy gains at birth are slowing in the UK

In England: **widening gap** in life expectancy at birth between the most and least deprived

UK Health

Physical activity

54% adults in past 4 weeks

49% of 5-10 year old children usually walk to school

Overweight or obese population on the rise

2/3 of adults

1/3 of 11-15 year olds

1/4 of 2-10 year olds

- Pressure on NHS
- Move to prevention & planning

Ref: ONS Measuring National Well-being - What we do, 2012; DfT Cycling and Walking Investment Strategy, 2017; Public Health England

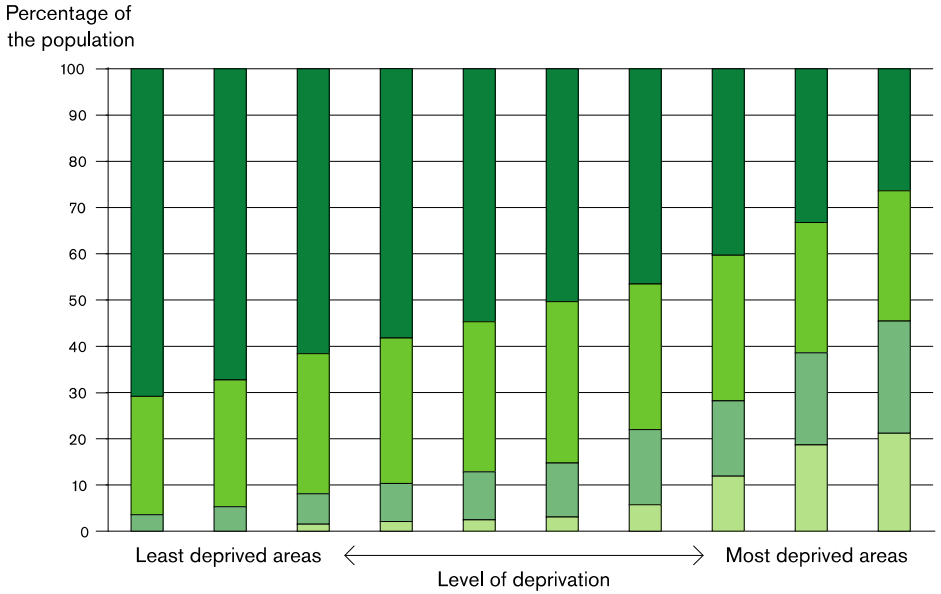
Health Inequalities
& Link to Built Environment

Difference between least and most deprived neighbourhoods:

9 years life expectancy

18 years “healthy life”

Environment and health impacts are strongly linked



Environmental conditions: river water quality, air quality, green space, habitat favourable to bio-diversity, flood risk, litter, detritus, housing conditions, road accidents, regulated sites (e.g. landfill)

Source: Department for Environment, Food and Rural Affairs[23]

Ref: Marmot, 2010 and 2013

Overheating in housing

What is overheating?

Little guidance from the WHO

Comfort depends on both environmental and human factors
Duration & timing of high temperatures is important

Very high temperatures > 35°C lead to **Heat stress**
High bedrooms temperatures (>26°C) can impair sleep

CIBSE TM59 criteria & assessment methodology

- Living rooms, kitchens and bedrooms: no more than 3% of May to September occupied hours where Δtin-out $\geq$ 1K.
- Bedrooms : no more than 1% of annual hours from 10pm to 7am where Operative T $>$ 26°C
- Needs dynamic thermal modelling

How prevalent is overheating?

Energy Follow Up Survey 2017 study for BEIS (Lomas et al, 2021)

Combination of monitoring & user feedback on 750 homes, during 2018 heatwave

Weighted to national stock: overheating in **19% bedrooms and 15% living rooms**

… in the 2030s, these may be common summer events

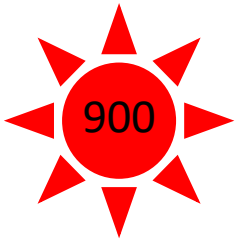
Is retrofit a problem?

Inefficient homes are an important health issue … and often contribute to health inequalities

Excess mortality (pre-covid)

Ref: Public Health England

England - 2003, 2006



England, 2018

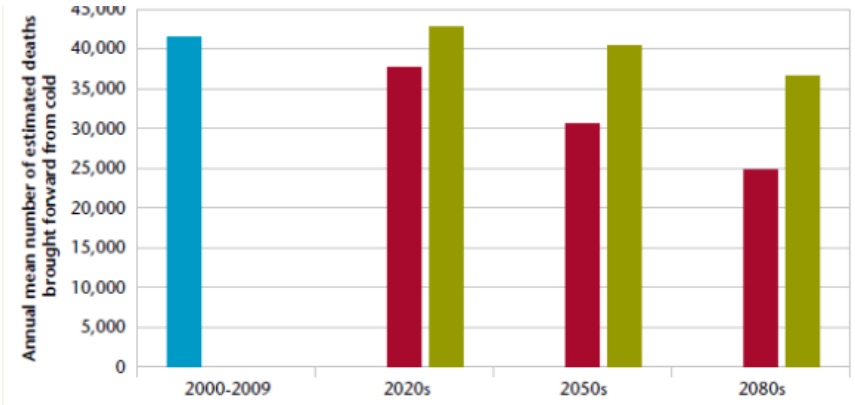
England & Wales, incl. flu

Projected excess mortality

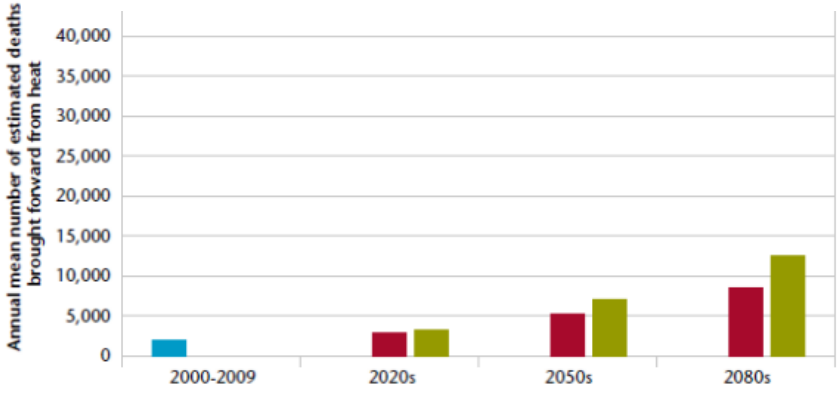
Ref: CCC

Present Projected – CC Projected – CC & pop growth

Cold-related mortality



Heat-related mortality



Are high insulation & airtightness creating an overheating risk?

Energy Follow Up Survey 2017 study for BEIS (Lomas et al, 2021):

No significant differences in measured prevalence for any of the **energy efficiency** measures (wall insulation, glazing type, number of measures applied)

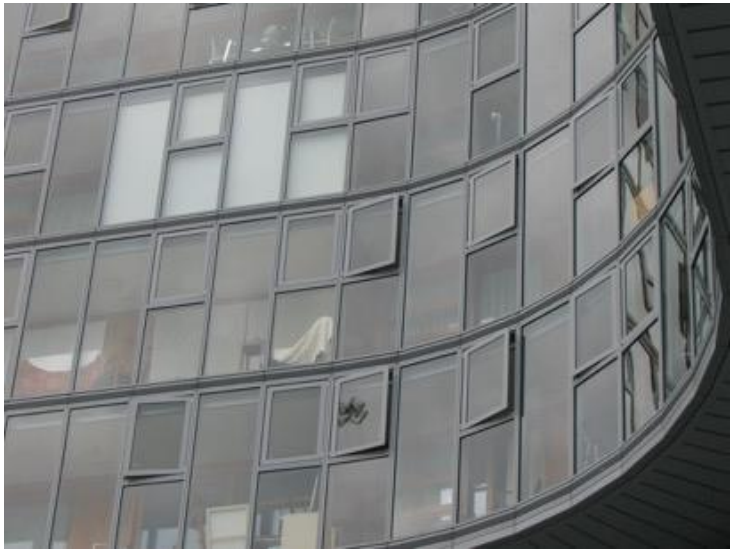
- BUT households with least **loft insulation** (<50mm) significantly more likely to report overheating
- Dwellings with SAP rating A-C had more measured overheating than D-G dwellings, but
  - Not very statistically significant
  - These A-C rated dwellings were significantly more likely to be flats

➢ Recommend continued vigilance

Important and statistically significant risk factors:

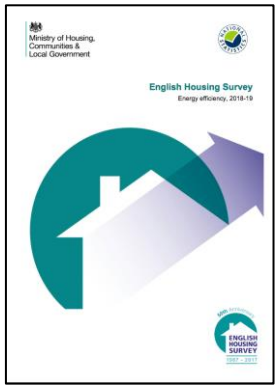
- **Flats** vs detached and semi-detached dwellings
- **Dwelling size**
- **London** vs other regions

Building design and site context are crucial factors



Building design and site context are crucial factors

The situation now
How can people cool their homes?

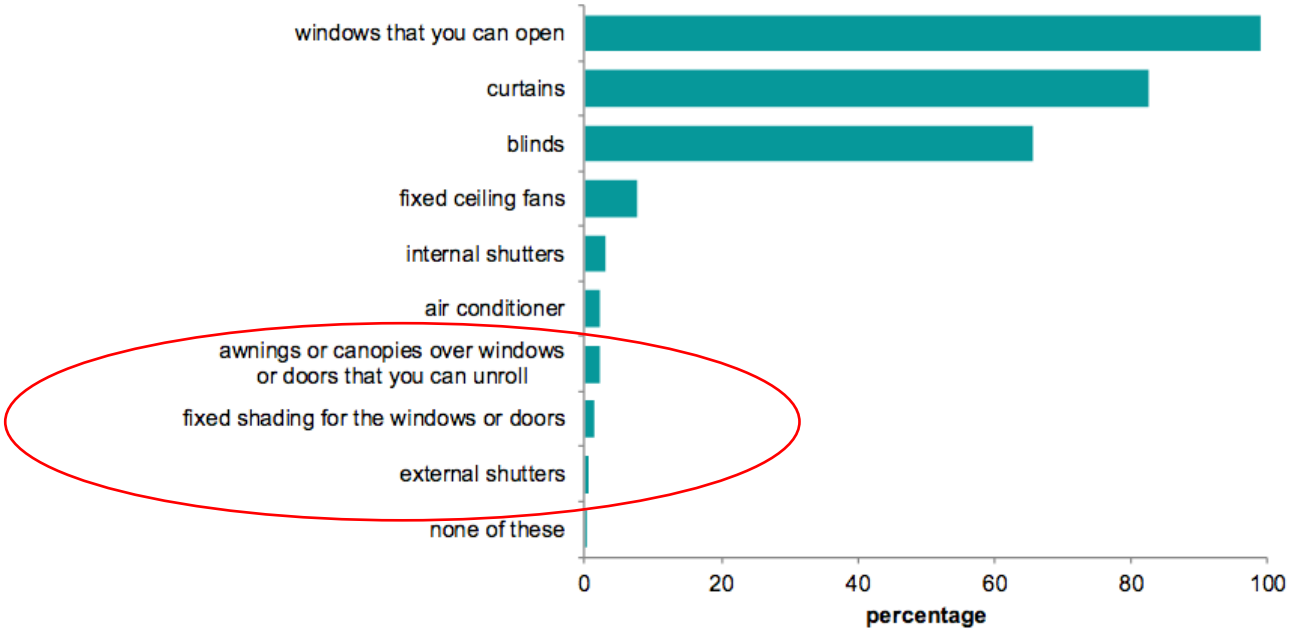


English Housing Survey

Energy efficiency, 2018-19

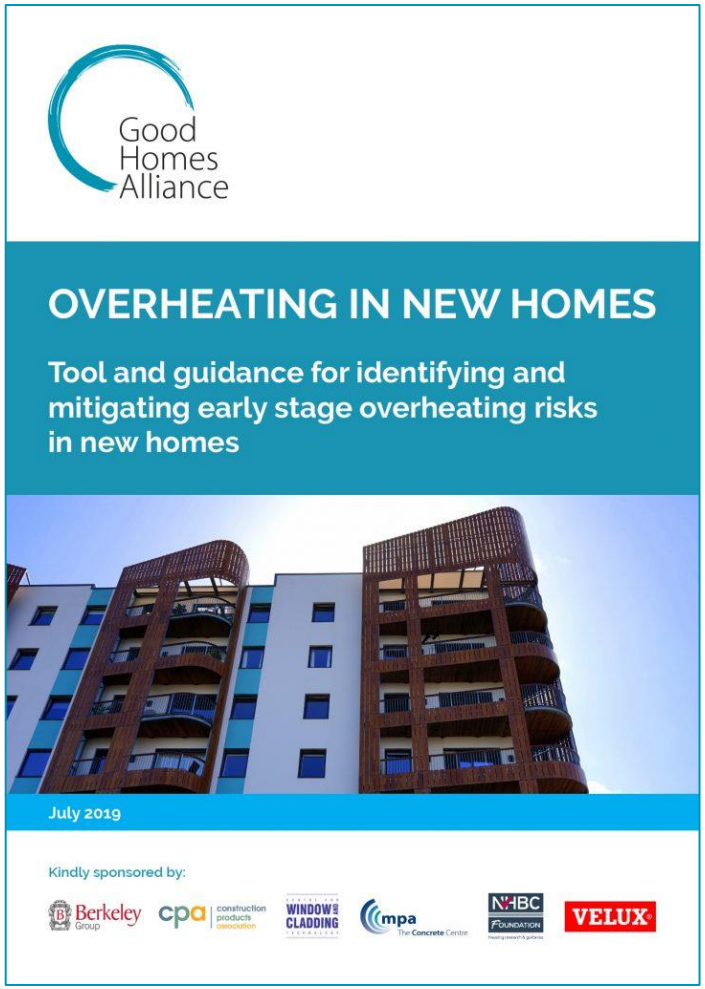
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/898344/Energy_Report.pdf

Figure 2.6: Presence of household cooling devices, 2018-19



What we can do

Overheating in New Homes: Tool & Guidance



https://goodhomes.org.uk/overheating-in-new-homes

FREE

Pilot version for retrofit & new homes
Expected early 2022

Overheating in New Homes: Tool & Guidance

*Better support **local authorities** and project teams in*

*the **evaluation of overheating risk** in new residential planning applications,*

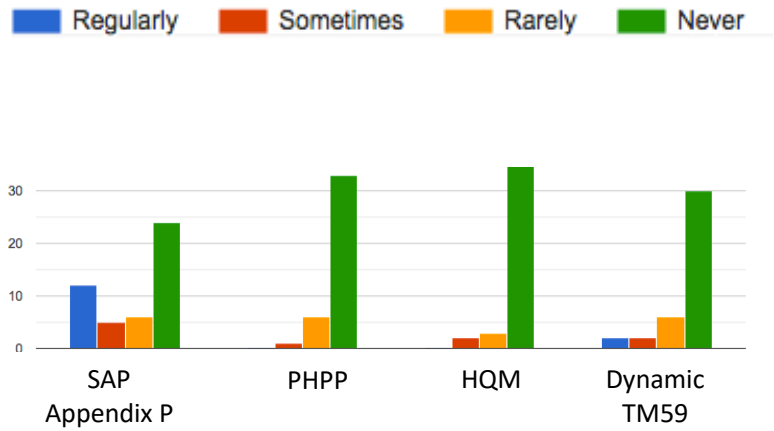
*and raise awareness of possible **design solutions***

Berkeley Group | cpa construction products association | mpa The Concrete Centre | NHBC Foundation Housing research & guidance | VELUX | Centre for Window and Cladding Technology

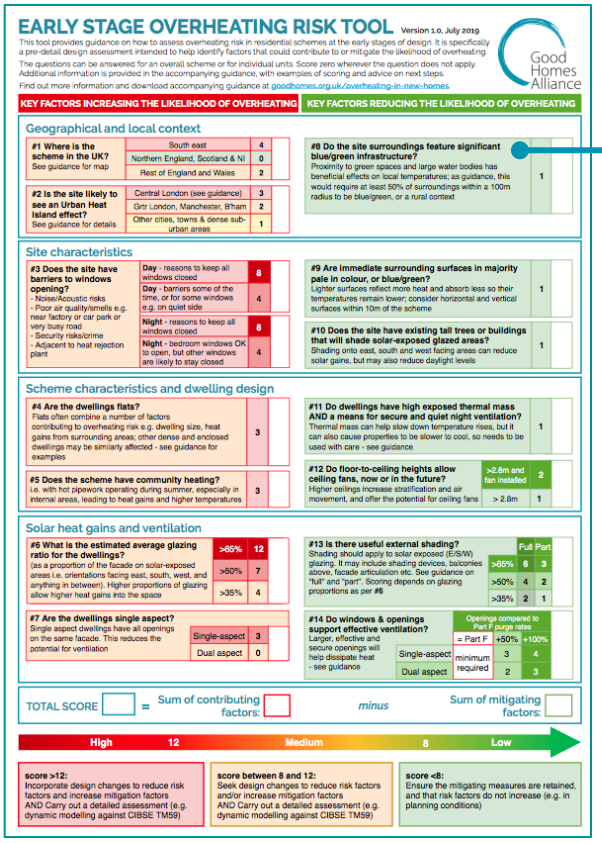
How do local authorities approach overheating? 2019 survey

Who leads on determining whether overheating risk has been adequately addressed?

How frequently do you request applicants to use these tools and methodologies?



One-page tool + Guidance



EARLY STAGE OVERHEATING RISK TOOL

Version 1.0, July 2019

This tool provides guidance on how to assess overheating risk in residential schemes at the early stages of design. It is specifically a pre-detail design assessment intended to help identify factors that could contribute to or mitigate the likelihood of overheating.

The questions can be answered for an overall scheme or for individual units. Score zero wherever the question does not apply. Additional information is provided in the accompanying guidance, with examples of scoring and advice on next steps.

Find out more information and download accompanying guidance at goodhomes.org.uk/overheating-in-new-homes

Good Homes Alliance

KEY FACTORS INCREASING THE LIKELIHOOD OF OVERHEATING | **KEY FACTORS REDUCING THE LIKELIHOOD OF OVERHEATING**

Geographical and local context

#1 Where is the scheme in the UK? See guidance for map

South east	4
Northern England, Scotland & NI	0
Rest of England and Wales	2

#2 Is the site likely to see an Urban Heat Island effect? See guidance for details

Central London (see guidance)	3
Grtr London, Manchester, B'ham	2
Other cities, towns & dense sub-urban areas	1

#8 Do the site surroundings feature significant blue/green infrastructure? Proximity to green spaces and large water bodies has beneficial effects on local temperatures; as guidance, this would require at least 50% of surroundings within a 100m radius to be blue/green, or a rural context — 1

Site characteristics

#3 Does the site have barriers to windows opening? - Noise/Acoustic risks - Poor air quality/smells e.g. near factory or car park or very busy road - Security risks/crime - Adjacent to heat rejection plant

Day - reasons to keep all windows closed	8
Day - barriers some of the time, or for some windows e.g. on quiet side	4
Night - reasons to keep all windows closed	8
Night - bedroom windows OK to open, but other windows are likely to stay closed	4

#9 Are immediate surrounding surfaces in majority pale in colour, or blue/green? Lighter surfaces reflect more heat and absorb less so their temperatures remain lower; consider horizontal and vertical surfaces within 10m of the scheme — 1

#10 Does the site have existing tall trees or buildings that will shade solar-exposed glazed areas? Shading onto east, south and west facing areas can reduce solar gains, but may also reduce daylight levels — 1

Scheme characteristics and dwelling design

#4 Are the dwellings flats? Flats often combine a number of factors contributing to overheating risk e.g. dwelling size, heat gains from surrounding areas; other dense and enclosed dwellings may be similarly affected - see guidance for examples — 3

#5 Does the scheme have community heating? I.e. with hot pipework operating during summer, especially in internal areas, leading to heat gains and higher temperatures — 3

#11 Do dwellings have high exposed thermal mass AND a means for secure and quiet night ventilation? Thermal mass can help slow down temperature rises, but it can also cause properties to be slower to cool, so needs to be used with care - see guidance — 1

#12 Do floor-to-ceiling heights allow ceiling fans, now or in the future? Higher ceilings increase stratification and air movement, and offer the potential for ceiling fans

>2.8m and fan installed	2
> 2.8m	1

Solar heat gains and ventilation

#6 What is the estimated average glazing ratio for the dwellings? (as a proportion of the facade on solar-exposed areas i.e. orientations facing east, south, west, and anything in between). Higher proportions of glazing allow higher heat gains into the space

>65%	12
>50%	7
>35%	4

#13 Is there useful external shading? Shading should apply to solar exposed (E/S/W) glazing. It may include shading devices, balconies above, facade articulation etc. See guidance on "full" and "part". Scoring depends on glazing proportions as per **#6**

	Full	Part
>65%	6	3
>50%	4	2
>35%	2	1

#7 Are the dwellings single aspect? Single aspect dwellings have all openings on the same facade. This reduces the potential for ventilation

Single-aspect	3
Dual aspect	0

#14 Do windows & openings support effective ventilation? Larger, effective and secure openings will help dissipate heat - see guidance

	Openings compared to Part F purge rates: = Part F	+50%	+100%
Single-aspect	minimum required	3	4
Dual aspect		2	3

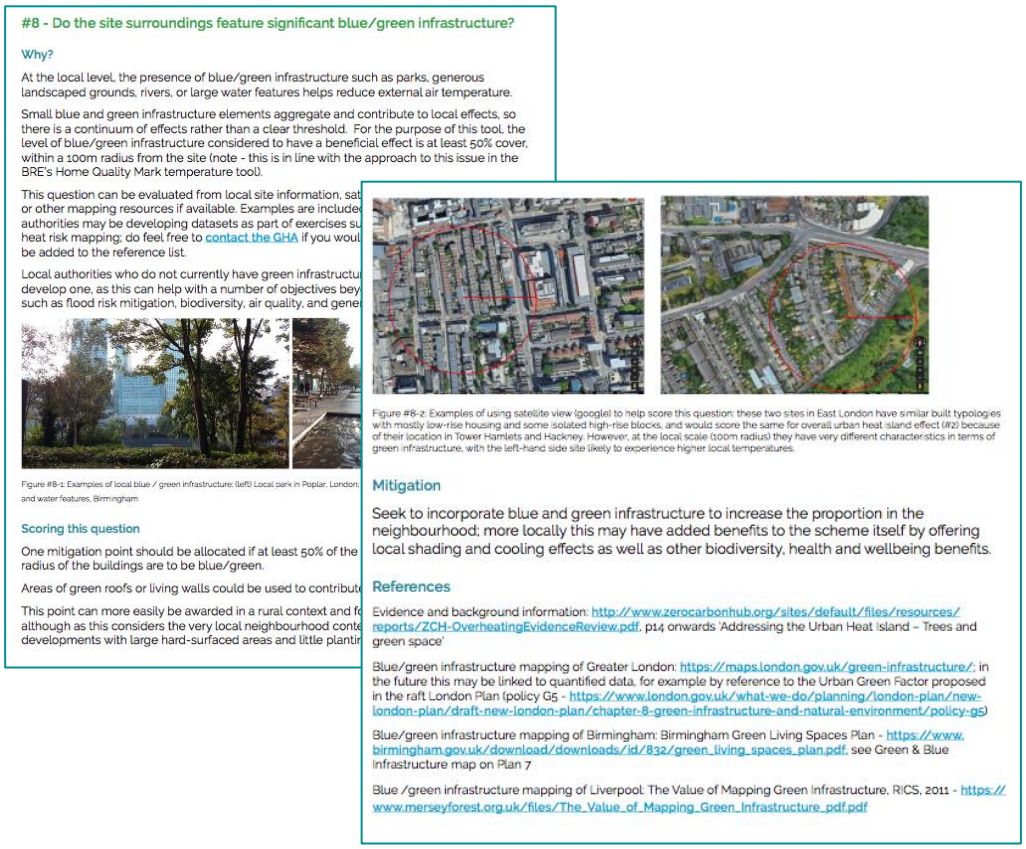
TOTAL SCORE = Sum of contributing factors: *minus* Sum of mitigating factors:

High 12 Medium 8 Low

score >12: Incorporate design changes to reduce risk factors and increase mitigation factors AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score between 8 and 12: Seek design changes to reduce risk factors and/or increase mitigation factors AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score <8: Ensure the mitigating measures are retained, and that risk factors do not increase (e.g. in planning conditions)



#8 - Do the site surroundings feature significant blue/green infrastructure?

Why?

At the local level, the presence of blue/green infrastructure such as parks, generous landscaped grounds, rivers, or large water features helps reduce external air temperature.

Small blue and green infrastructure elements aggregate and contribute to local effects, so there is a continuum of effects rather than a clear threshold. For the purpose of this tool, the level of blue/green infrastructure considered to have a beneficial effect is at least 50% cover, within a 100m radius from the site (note - this is in line with the approach to this issue in the BRE's Home Quality Mark temperature tool).

This question can be evaluated from local site information, sat
or other mapping resources if available. Examples are include
authorities may be developing datasets as part of exercises su
heat risk mapping; do feel free to contact the GHA if you woul
be added to the reference list.

Local authorities who do not currently have green infrastructu
develop one, as this can help with a number of objectives bey
such as flood risk mitigation, biodiversity, air quality, and gene

Figure #8-1: Examples of local blue / green infrastructure: (left) Local park in Poplar, London; and water features, Birmingham

Scoring this question

One mitigation point should be allocated if at least 50% of the
radius of the buildings are to be blue/green.

Areas of green roofs or living walls could be used to contribut

This point can more easily be awarded in a rural context and fo
although as this considers the very local neighbourhood conte
developments with large hard-surfaced areas and little plantir

Figure #8-2: Examples of using satellite view (google) to help score this question: these two sites in East London have similar built typologies with mostly low-rise housing and some isolated high-rise blocks, and would score the same for overall urban heat island effect (#2) because of their location in Tower Hamlets and Hackney. However, at the local scale (100m radius) they have very different characteristics in terms of green infrastructure, with the left-hand side site likely to experience higher local temperatures.

Mitigation

Seek to incorporate blue and green infrastructure to increase the proportion in the neighbourhood; more locally this may have added benefits to the scheme itself by offering local shading and cooling effects as well as other biodiversity, health and wellbeing benefits.

References

Evidence and background information: http://www.zerocarbonhub.org/sites/default/files/resources/reports/ZCH-OverheatingEvidenceReview.pdf, p14 onwards 'Addressing the Urban Heat Island – Trees and green space'

Blue/green infrastructure mapping of Greater London: https://maps.london.gov.uk/green-infrastructure/; in the future this may be linked to quantified data, for example by reference to the Urban Green Factor proposed in the raft London Plan (policy G5 - https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/draft-new-london-plan/chapter-8-green-infrastructure-and-natural-environment/policy-g5)

Blue/green infrastructure mapping of Birmingham: Birmingham Green Living Spaces Plan - https://www.birmingham.gov.uk/download/downloads/id/832/green_living_spaces_plan.pdf, see Green & Blue Infrastructure map on Plan 7

Blue /green infrastructure mapping of Liverpool: The Value of Mapping Green Infrastructure, RICS, 2011 - https://www.merseyforest.org.uk/files/The_Value_of_Mapping_Green_Infrastructure_pdf.pdf

“First filter”

TOOL

High risk

Recommendation:
Mitigation & Modelling

Medium risk

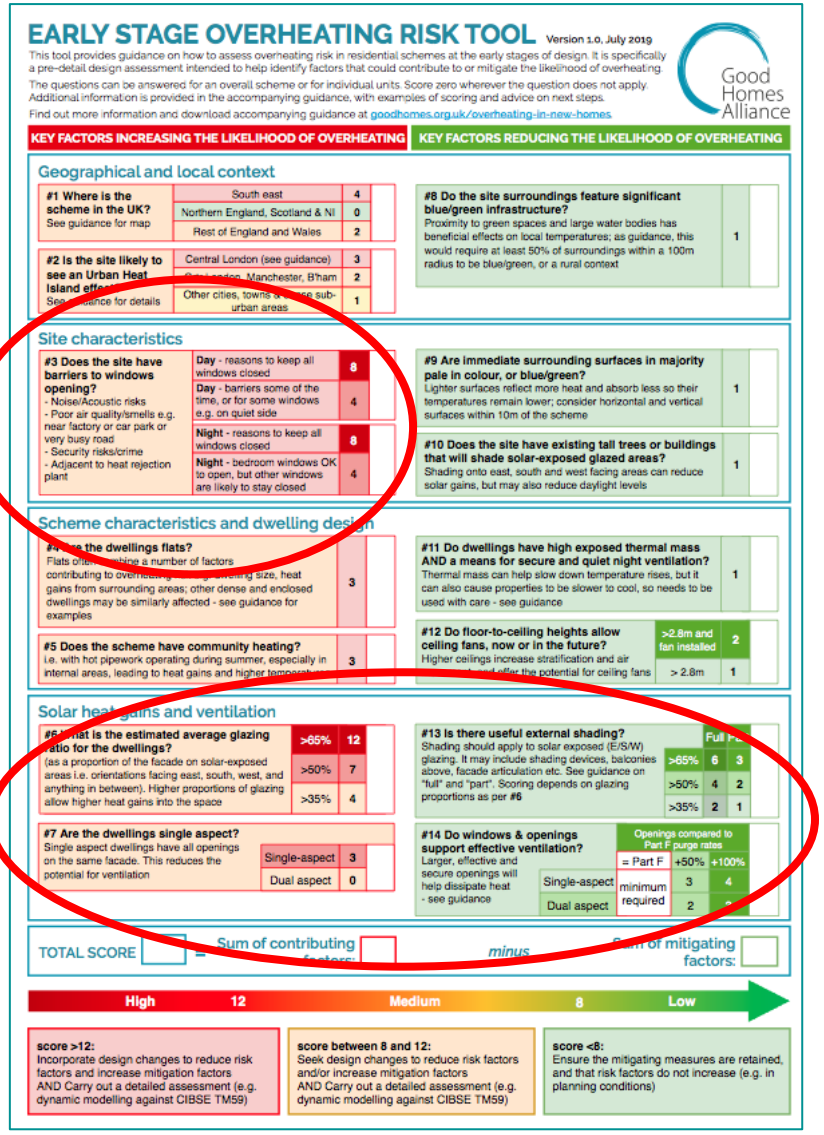
Recommendation:
Modelling to inform the design & as evidence

Low risk

NEXT STEPS

Planning conditions
Detailed design
Handover & user guide

Balancing risk and mitigation factors



EARLY STAGE OVERHEATING RISK TOOL

Version 1.0, July 2019

This tool provides guidance on how to assess overheating risk in residential schemes at the early stages of design. It is specifically a pre-detail design assessment intended to help identify factors that could contribute to or mitigate the likelihood of overheating.

The questions can be answered for an overall scheme or for individual units. Score zero wherever the question does not apply. Additional information is provided in the accompanying guidance, with examples of scoring and advice on next steps.

Find out more information and download accompanying guidance at goodhomes.org.uk/overheating-in-new-homes

Good Homes Alliance

KEY FACTORS INCREASING THE LIKELIHOOD OF OVERHEATING | **KEY FACTORS REDUCING THE LIKELIHOOD OF OVERHEATING**

Geographical and local context

#1 Where is the scheme in the UK? See guidance for map

South east	4
Northern England, Scotland & NI	0
Rest of England and Wales	2

#2 Is the site likely to see an Urban Heat Island effect? See guidance for details

Central London (see guidance)	3
Other cities, towns & dense sub-urban areas	1

#8 Do the site surroundings feature significant blue/green infrastructure? Proximity to green spaces and large water bodies has beneficial effects on local temperatures; as guidance, this would require at least 50% of surroundings within a 100m radius to be blue/green, or a rural context — 1

Site characteristics

#3 Does the site have barriers to windows opening?
- Noise/Acoustic risks
- Poor air quality/smells e.g. near factory or car park or very busy road
- Security risks/crime
- Adjacent to heat rejection plant

Day - reasons to keep all windows closed	8
Day - barriers some of the time, or for some windows e.g. on quiet side	4
Night - reasons to keep all windows closed	8
Night - bedroom windows OK to open, but other windows are likely to stay closed	4

#9 Are immediate surrounding surfaces in majority pale in colour, or blue/green? Lighter surfaces reflect more heat and absorb less so their temperatures remain lower; consider horizontal and vertical surfaces within 10m of the scheme — 1

#10 Does the site have existing tall trees or buildings that will shade solar-exposed glazed areas? Shading onto east, south and west facing areas can reduce solar gains, but may also reduce daylight levels — 1

Scheme characteristics and dwelling design

#4 Are the dwellings flats? Flats often combine a number of factors contributing to overheating, including small floor area, heat gains from surrounding areas; other dense and enclosed dwellings may be similarly affected - see guidance for examples — 3

#5 Does the scheme have community heating? i.e. with hot pipework operating during summer, especially in internal areas, leading to heat gains and higher temperatures — 3

#11 Do dwellings have high exposed thermal mass AND a means for secure and quiet night ventilation? Thermal mass can help slow down temperature rises, but it can also cause properties to be slower to cool, so needs to be used with care - see guidance — 1

#12 Do floor-to-ceiling heights allow ceiling fans, now or in the future? Higher ceilings increase stratification and air movement, and offer the potential for ceiling fans

>2.8m and fan installed	2
> 2.8m	1

Solar heat gains and ventilation

#6 What is the estimated average glazing ratio for the dwellings? (as a proportion of the façade on solar-exposed areas i.e. orientations facing east, south, west, and anything in between). Higher proportions of glazing allow higher heat gains into the space

>65%	12
>50%	7
>35%	4

#13 Is there useful external shading? Shading should apply to solar exposed (E/S/W) glazing. It may include shading devices, balconies above, façade articulation etc. See guidance on "full" and "part". Scoring depends on glazing proportions as per #6

	Full	Part
>65%	6	3
>50%	4	2
>35%	2	1

#7 Are the dwellings single aspect? Single aspect dwellings have all openings on the same façade. This reduces the potential for ventilation

Single-aspect	3
Dual aspect	0

#14 Do windows & openings support effective ventilation? Larger, effective and secure openings will help dissipate heat - see guidance

	Openings compared to Part F purge rates: = Part F	+50%	+100%
Single-aspect	minimum required	3	4
Dual aspect		2	

TOTAL SCORE = Sum of contributing factors: *minus* Sum of mitigating factors:

High 12 Medium 8 Low

score >12: Incorporate design changes to reduce risk factors and increase mitigation factors AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score between 8 and 12: Seek design changes to reduce risk factors and/or increase mitigation factors AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score <8: Ensure the mitigating measures are retained, and that risk factors do not increase (e.g. in planning conditions)

HEAT GAINS

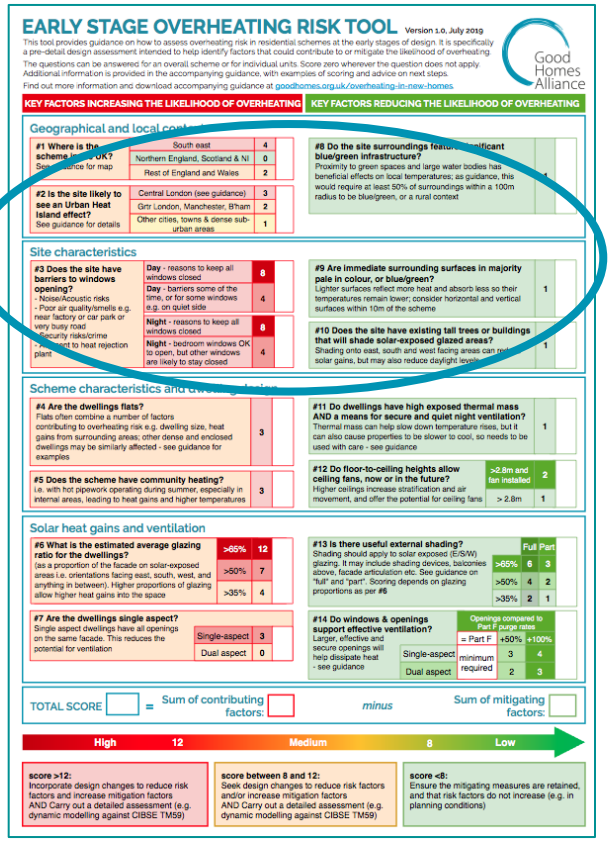
Solar gains
Local climate
Site surroundings

MITIGATING FACTORS & CAPACITY TO DISSIPATE HEAT

Ventilation potential
Site surroundings

Focus on site factors,
urban heat & green infrastructure

Urban heat & green infrastructure



EARLY STAGE OVERHEATING RISK TOOL Version 1.0, July 2019

This tool provides guidance on how to assess overheating risk in residential schemes at the early stages of design. It is specifically a pre-detail design assessment intended to help identify factors that could contribute to or mitigate the likelihood of overheating. The questions can be answered for an overall scheme or for individual units. Score zero wherever the question does not apply. Additional information is provided in the accompanying guidance, with examples of scoring and advice on next steps.

Find out more information and download accompanying guidance at goodhomes.org.uk/overheating-in-new-homes

Good Homes Alliance

KEY FACTORS INCREASING THE LIKELIHOOD OF OVERHEATING | KEY FACTORS REDUCING THE LIKELIHOOD OF OVERHEATING

Geographical and local context

#1 Where is the scheme located in the UK? See guidance for map
- South east: 4
- Northern England, Scotland & NI: 0
- Rest of England and Wales: 2

#2 Is the site likely to see an Urban Heat Island effect? See guidance for details
- Central London (see guidance): 3
- Grtr London, Manchester, B'ham: 2
- Other cities, towns & dense sub-urban areas: 1

#8 Do the site surroundings feature significant blue/green infrastructure? Proximity to green spaces and large water bodies has beneficial effects on local temperatures; as guidance, this would require at least 50% of surroundings within a 100m radius to be blue/green, or a rural context: 1

Site characteristics

#3 Does the site have barriers to windows opening? - Noise/Acoustic risks - Poor air quality/smells e.g. near factory or car park or very busy road - Security risks/crime - Proximity to heat rejection plant
- Day - reasons to keep all windows closed: 8
- Day - barriers some of the time, or for some windows e.g. on quiet side: 4
- Night - reasons to keep all windows closed: 8
- Night - bedroom windows OK to open, but other windows are likely to stay closed: 4

#9 Are immediate surrounding surfaces in majority pale in colour, or blue/green? Lighter surfaces reflect more heat and absorb less so their temperatures remain lower; consider horizontal and vertical surfaces within 10m of the scheme: 1

#10 Does the site have existing tall trees or buildings that will shade solar-exposed glazed areas? Shading onto east, south and west facing areas can reduce solar gains, but may also reduce daylight levels: 1

Scheme characteristics and design features

#4 Are the dwellings flats? Flats often combine a number of factors contributing to overheating risk e.g. dwelling size, heat gains from surrounding areas; other dense and enclosed dwellings may be similarly affected - see guidance for examples: 3

#11 Do dwellings have high exposed thermal mass AND a means for secure and quiet night ventilation? Thermal mass can help slow down temperature rises, but it can also cause properties to be slower to cool, so needs to be used with care - see guidance: 1

#5 Does the scheme have community heating? I.e. with hot pipework operating during summer, especially in internal areas, leading to heat gains and higher temperatures: 3

#12 Do floor-to-ceiling heights allow ceiling fans, now or in the future? Higher ceilings increase stratification and air movement, and offer the potential for ceiling fans
- >2.8m and fan installed: 2
- > 2.8m: 1

Solar heat gains and ventilation

#6 What is the estimated average glazing ratio for the dwellings? (as a proportion of the façade on solar-exposed areas i.e. orientations facing east, south, west, and anything in between). Higher proportions of glazing allow higher heat gains into the space
- >65%: 12
- >50%: 7
- >35%: 4

#13 Is there useful external shading? Shading should apply to solar exposed (E/S/W) glazing. It may include shading devices, balconies above, façade articulation etc. See guidance on "full" and "part". Scoring depends on glazing proportions as per #6

	Full	Part
>65%	6	3
>50%	4	2
>35%	2	1

#7 Are the dwellings single aspect? Single aspect dwellings have all openings on the same façade. This reduces the potential for ventilation
- Single-aspect: 3
- Dual aspect: 0

#14 Do windows & openings support effective ventilation? Larger, effective and secure openings will help dissipate heat - see guidance

	Openings compared to Part F purge rates		
	= Part F	+50%	+100%
Single-aspect	minimum required	3	4
Dual aspect		2	3

TOTAL SCORE = Sum of contributing factors: minus Sum of mitigating factors:

High 12 Medium 8 Low

score >12: Incorporate design changes to reduce risk factors and increase mitigation factors AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score between 8 and 12: Seek design changes to reduce risk factors and/or increase mitigation factors AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score <8: Ensure the mitigating measures are retained, and that risk factors do not increase (e.g. in planning conditions)

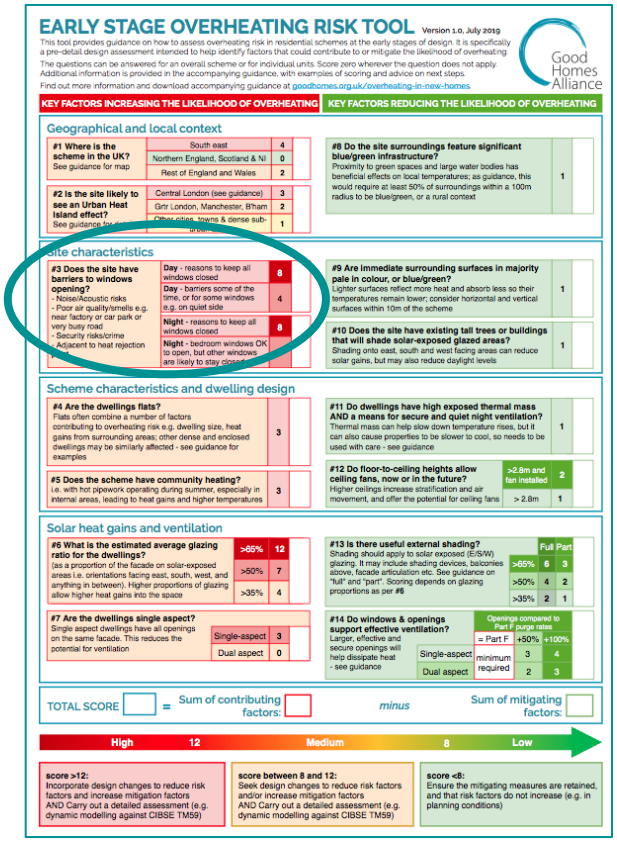
RISK FACTORS

Urban location
Barriers to window openings

MITIGATING FACTORS

Surrounding greenery & shading

Barriers to Opening



EARLY STAGE OVERHEATING RISK TOOL Version 1.0, July 2019

This tool provides guidance on how to assess overheating risk in residential schemes at the early stages of design. It is specifically a pre-detail design assessment intended to help identify factors that could contribute to or mitigate the likelihood of overheating. The questions can be answered for an overall scheme or for individual units. Score zero wherever the question does not apply. Additional information is provided in the accompanying guidance, with examples of scoring and advice on next steps.

Find out more information and download accompanying guidance at goodhomes.org.uk/overheating-in-new-homes

Good Homes Alliance

KEY FACTORS INCREASING THE LIKELIHOOD OF OVERHEATING | KEY FACTORS REDUCING THE LIKELIHOOD OF OVERHEATING

Geographical and local context

#1 Where is the scheme in the UK? See guidance for map
- South east: 4
- Northern England, Scotland & NI: 0
- Rest of England and Wales: 2

#2 Is the site likely to see an Urban Heat Island effect? See guidance for
- Central London (see guidance): 3
- Grtr London, Manchester, B'ham: 2
- Other cities, towns & dense sub-: 1

#8 Do the site surroundings feature significant blue/green infrastructure? Proximity to green spaces and large water bodies has beneficial effects on local temperatures; as guidance, this would require at least 50% of surroundings within a 100m radius to be blue/green, or a rural context: 1

Site characteristics

#3 Does the site have barriers to windows opening?
- Noise/Acoustic risks
- Poor air quality/smells e.g. near factory or car park or very busy road
- Security risks/crime
- Adjacent to heat rejection

- **Day** - reasons to keep all windows closed: 8
- **Day** - barriers some of the time, or for some windows e.g. on quiet side: 4
- **Night** - reasons to keep all windows closed: 8
- **Night** - bedroom windows OK to open, but other windows are likely to stay closed

#9 Are immediate surrounding surfaces in majority pale in colour, or blue/green? Lighter surfaces reflect more heat and absorb less so their temperatures remain lower; consider horizontal and vertical surfaces within 10m of the scheme: 1

#10 Does the site have existing tall trees or buildings that will shade solar-exposed glazed areas? Shading onto east, south and west facing areas can reduce solar gains, but may also reduce daylight levels: 1

Scheme characteristics and dwelling design

#4 Are the dwellings flats? Flats often combine a number of factors contributing to overheating risk e.g. dwelling size, heat gains from surrounding areas; other dense and enclosed dwellings may be similarly affected - see guidance for examples: 3

#5 Does the scheme have community heating? I.e. with hot pipework operating during summer, especially in internal areas, leading to heat gains and higher temperatures: 3

#11 Do dwellings have high exposed thermal mass AND a means for secure and quiet night ventilation? Thermal mass can help slow down temperature rises, but it can also cause properties to be slower to cool, so needs to be used with care - see guidance: 1

#12 Do floor-to-ceiling heights allow ceiling fans, now or in the future? Higher ceilings increase stratification and air movement, and offer the potential for ceiling fans
- >2.8m and fan installed: 2
- > 2.8m: 1

Solar heat gains and ventilation

#6 What is the estimated average glazing ratio for the dwellings? (as a proportion of the façade on solar-exposed areas i.e. orientations facing east, south, west, and anything in between). Higher proportions of glazing allow higher heat gains into the space
- >65%: 12
- >50%: 7
- >35%: 4

#13 Is there useful external shading? Shading should apply to solar exposed (E/S/W) glazing. It may include shading devices, balconies above, façade articulation etc. See guidance on "full" and "part". Scoring depends on glazing proportions as per #6

	Full	Part
>65%	6	3
>50%	4	2
>35%	2	1

#7 Are the dwellings single aspect? Single aspect dwellings have all openings on the same façade. This reduces the potential for ventilation
- Single-aspect: 3
- Dual aspect: 0

#14 Do windows & openings support effective ventilation? Larger, effective and secure openings will help dissipate heat - see guidance

	Openings compared to Part F purge rates		
	= Part F	+50%	+100%
Single-aspect	minimum required	3	4
Dual aspect		2	3

TOTAL SCORE = Sum of contributing factors: *minus* Sum of mitigating factors:

High 12 | Medium 8 | Low

score >12: Incorporate design changes to reduce risk factors and increase mitigation factors AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score between 8 and 12: Seek design changes to reduce risk factors and/or increase mitigation factors AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

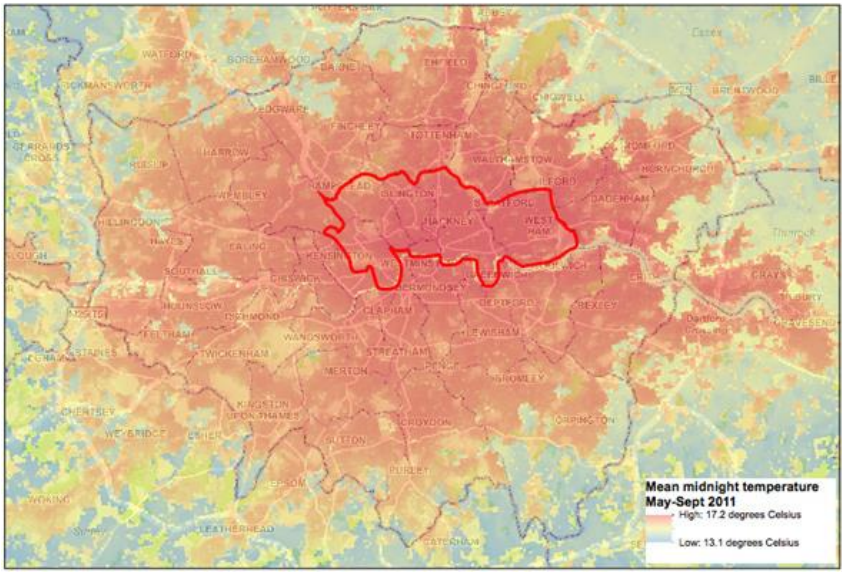
score <8: Ensure the mitigating measures are retained, and that risk factors do not increase (e.g. in planning conditions)

Day / Night

- Noise: link to Association of Noise Consultants guidance (AVOG)
- Safety
- Security
- Air quality & smells

Location: urban – semi-urban - rural

#2 Is the site likely to see an Urban Heat Island effect? See guidance for details	Central London (see guidance)	**3**
	Grtr London, Manchester, B'ham	**2**
	Other cities, towns & dense sub-urban areas	**1**



Other data sources e.g. Manchester, Birmingham

Surroundings within 100m

#8 Do the site surroundings feature significant blue/green infrastructure? Proximity to green spaces and large water bodies has beneficial effects on local temperatures; as guidance, this would require at least 50% of surroundings within a 100m radius to be blue/green, or a rural context	**1**	

Hard to quantify impact

Not captured in weather files, which are typically regional

GHA scoring loosely aligned with Home Quality Mark

Immediate surroundings

#9 Are immediate surrounding surfaces in majority pale in colour, or blue/green? Lighter surfaces reflect more heat and absorb less so their temperatures remain lower; consider horizontal and vertical surfaces within 10m of the scheme	**1**	

Hard to quantify impact

Ref: BRE

Shading from trees

#10 Does the site have existing tall trees or buildings that will shade solar-exposed glazed areas? Shading onto east, south and west facing areas can reduce solar gains, but may also reduce daylight levels	1	

Conservative scoring

Guidance that trees could be attributed more mitigation points if heavy shading, aligned with scoring of external shading

Future needs of housing to adapt to the climate change public health threat

Needs

*"Out of the Committee's list of priorities, this risk is notable for being the one where **policies still remain largely absent**.*

*There is still **little preventative action** being taken to address health risks from overheating in buildings, and in homes in particular. "*

CCC, 2021

Needs

Criteria

(Dis)comfort: CIBSE TM59 … Evolution of criteria for sleep / night time?

Varied population types e.g. vulnerable, elderly?

Criteria for health ?

Regulations

New residential buildings: New Building Regulations requirement

New method (Approved Document O): feedback in practice?

Existing homes: nothing, except HHSRS i.e. PRS, if there is a problem

Attention through planning

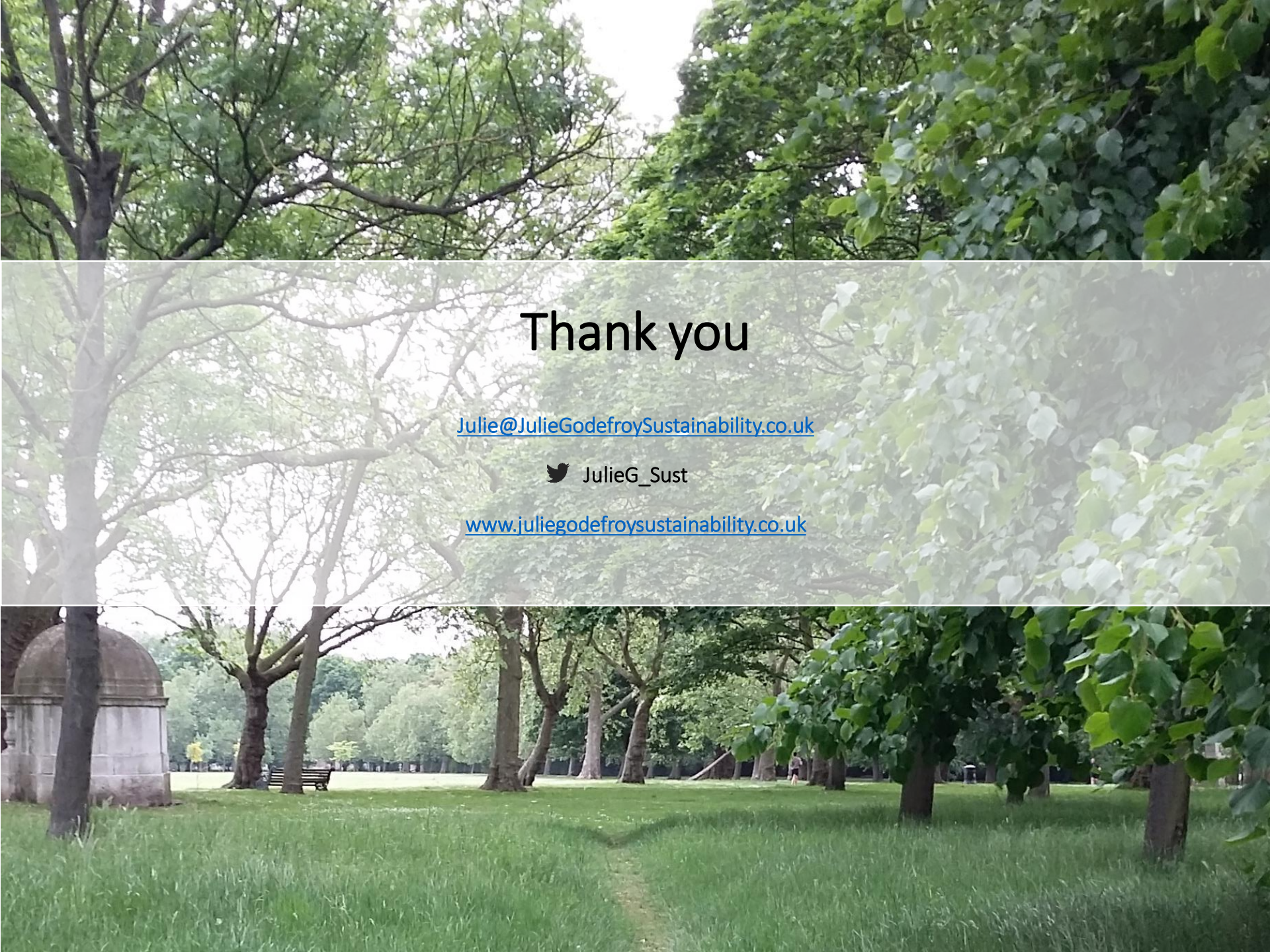
Some high-level principles, but little guidance & resources for local authorities

Inclusion in local plans (limited examples e.g. Greater London Authority)

A culture of in-use evaluation and feedback

Growing industry experience & new BS40101 (this week)

No regulatory driver, limited market adoption



Thank you

Julie@JulieGodefroySustainability.co.uk

JulieG_Sust

www.juliegodefroysustainability.co.uk