

Anastasia Mylona

CIBSE

Technology Strategy Board

Driving Innovation

Resources available for adapting buildings to the impacts of climate change



Dr Anastasia Mylona, CIBSE/ARCC Network
TSB MBE-KTN Building a Resilient Future

26th February, One Drummond Gate, Victoria, London





Knowledge Exchange

The Adaptation and Resilience in the Context of Change Network (ARCC) - Funded by EPSRC in January 2009 to coordinate and maximise impact of research

The Chartered Institution of Building Services Engineers –
Membership organisation which provides best practice guidance to building services engineers towards developing a sustainable built environment



ARCC Themes

Cities – Engineering resilient, low impact cities

Energy – Energy security, low carbon alternatives, resilient energy infrastructure

Future Infrastructure – Delivering robust national infrastructure systems into the future (energy, water, waste, transport and ICT)

Health and Wellbeing – Impacts of climate change to health and wellbeing and adaptation strategies

Overheating – Impacts of high temperatures to the overheating risk in buildings and adaptation strategies

Transport – Future resilience of transport systems; risks and interdependencies

Water – Resilient water supply and flood management



ARCC Resources – Designing for comfort

Future TRYs and DSYs using the UKCP09 Weather Generator for building performance modelling

Advice and evidence to support the Green Deal assessments on avoiding overheating risk in certain properties

Advice on keeping cool in the Heatwave Plan for England, 2012

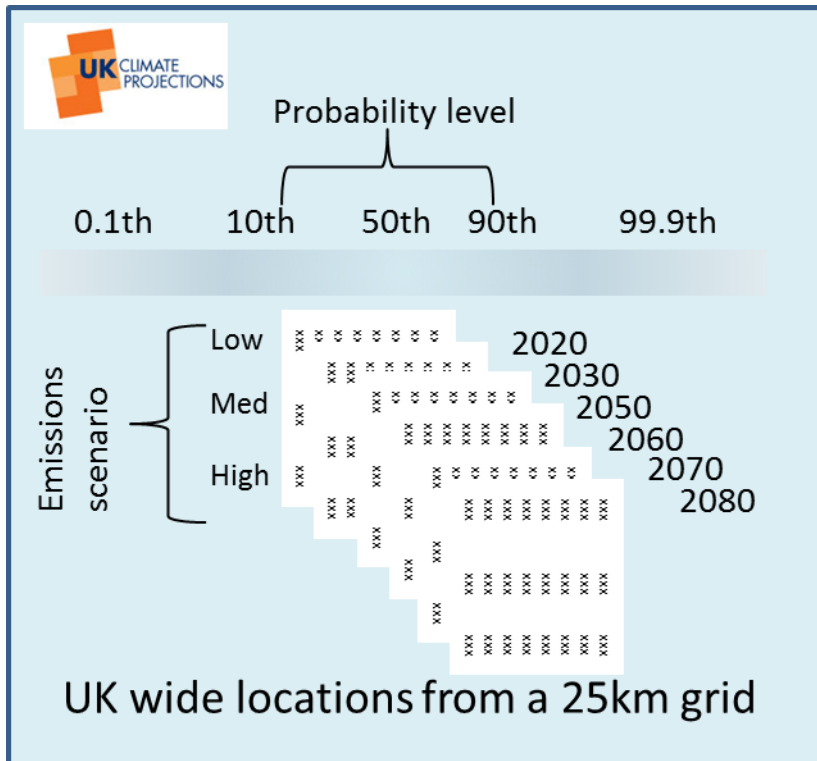
Building retrofit tool – selecting retrofitting packages for reducing overheating in existing homes

Robust Hospitals in a Changing climate film

ARCC Assembly – 10th and 11th June 2014



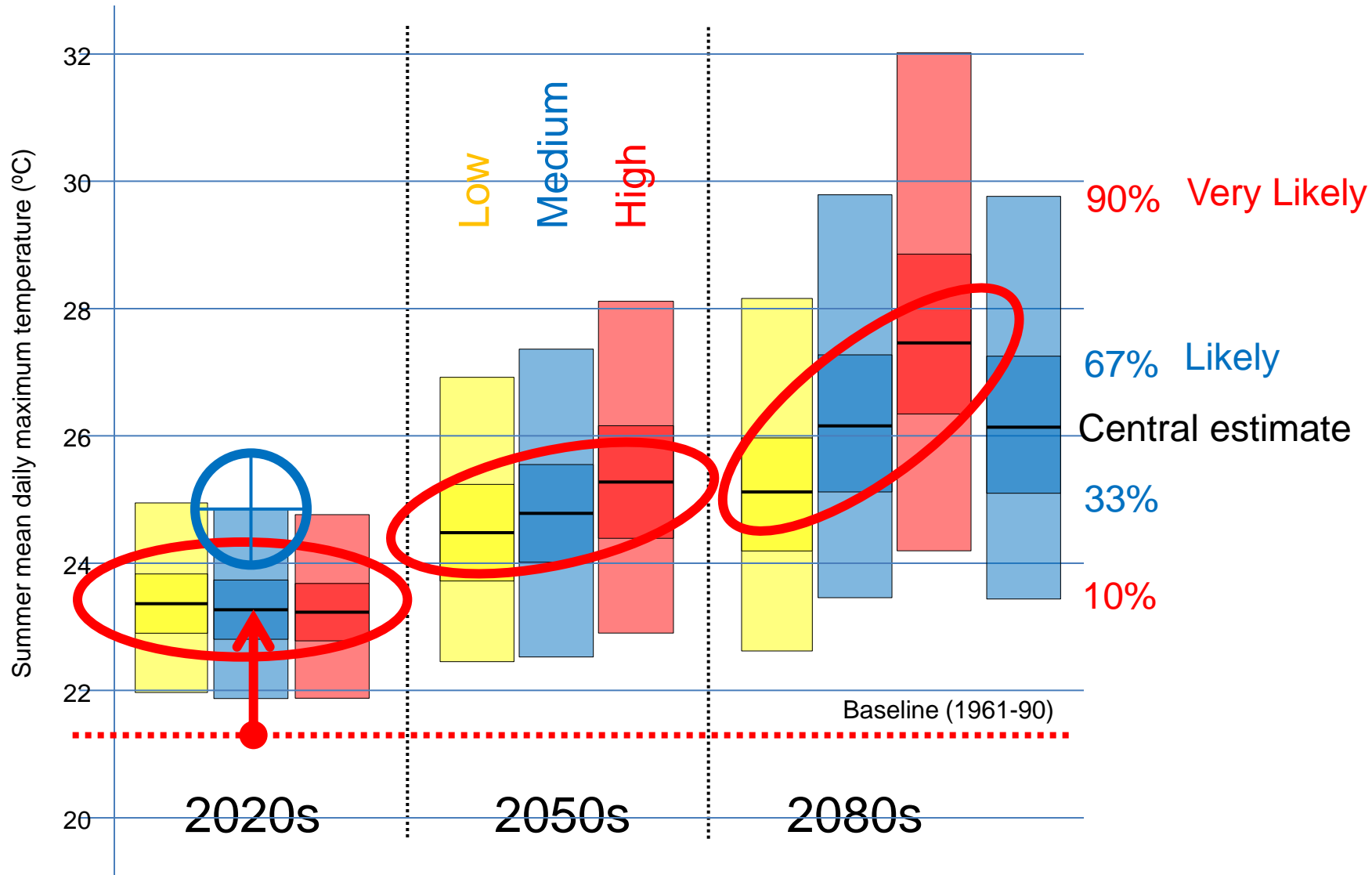
Designing for comfort - Which weather file?



Courtesy of Maria Shamash,
KTP Associate

Which Climate?

CIBSE Probabilistic Climate Profiles (ProCliP)



CIBSE Resources - ProClIPs

Overheating - Summer mean daily maximum temp

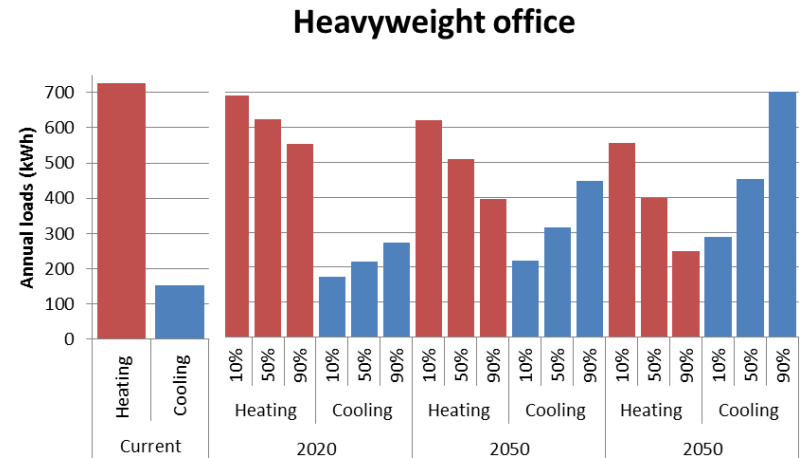
Energy - Seasonal average temperatures

- Winter mean air temperature
- Spring mean air temperature
- Summer mean air temperature
- Autumn mean air temperature

Heating demand - Winter mean daily minimum temp

Water management - Seasonal daily precipitation

- Winter mean daily precipitation
- Spring mean daily precipitation
- Summer mean daily precipitation
- Autumn mean daily precipitation



CIBSE Resources

TM49 Design Summer Years for London

- 3 London sites to better represent urban heat island effect
- 3 years per site to provide different measures of hot events
- Future DSYs for adapting buildings to future climates



CIBSE Resources

Design for Future Climate – Case studies

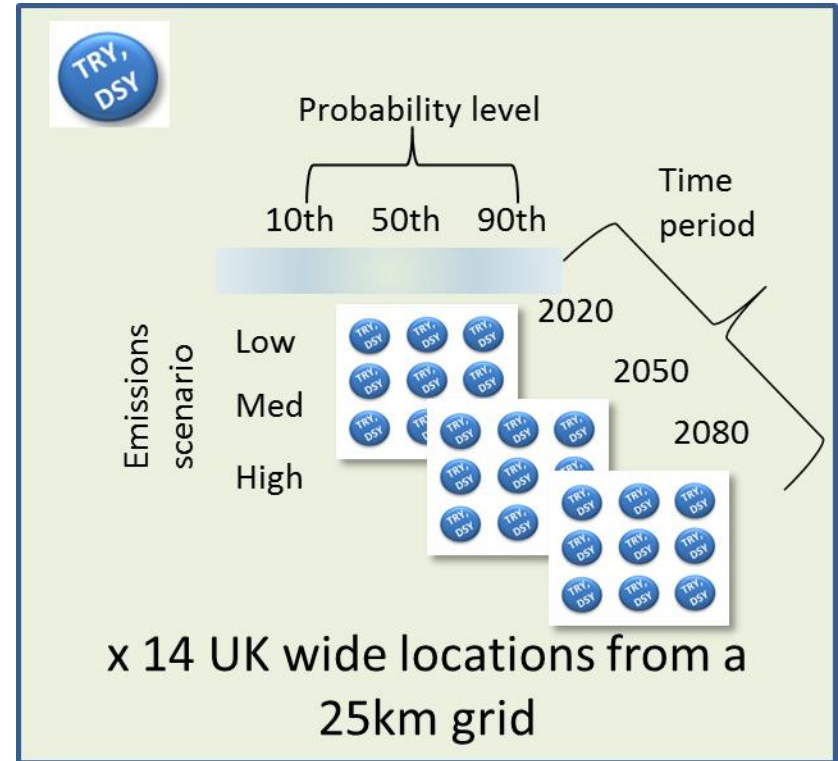
D4FC - Round 1 Case Studies	Building Type	Location
100 City Road	new build office	London
Church View	office refurbishment	Doncaster
University of Greenwich	higher education new build	London
Harris Academy	refurbishment and new build	Croydon, London
ExtraCare4Exeter	new build care home	Exeter



CIBSE Resources

Revised TRYs and DSYs current and future

- DSYs and TRYs based on a more recent baseline, 1984 – 2014
- Extra sites for selected locations that have high UHI variations
- Future DSYs and TRYs based on UKCP09



CIBSE Cities challenge

- Design and refurbishment of buildings within the community/city context
- Buildings' role in creating sustainable communities and cities:
 - Design of fabric, energy and HVAC systems, and occupancy of space in response to the surrounding environment
 - Energy efficient and carbon neutral design, considering the surrounding environment
- Buildings adapted to the impacts of climate change



Links to resources

- The Adaptation and Resilience in the Context of Change <http://www.arcc-cn.org.uk/>
- ARCC Overheating advice <http://www.arcc-network.org.uk/overheating/practical-guidance/>
<http://www.arcc-network.org.uk/overheating/messages-for-policy-makers/>
- PROMETHEUS - <http://emps.exeter.ac.uk/research/energy-environment/cee/projects/prometheus/>
- SNACC - <http://www.arcc-cn.org.uk/project-summaries/snacc/>
- CREW - <http://www.iesd.dmu.ac.uk/crew/>
- Robust Hospitals in a changing climate film - <http://sms.cam.ac.uk/media/1446036>
- CIBSE Knowledge Portal - <https://www.cibseknowledgeportal.co.uk/>
- ProClip Publication - https://www.cibseknowledgeportal.co.uk/component/dynamicdatabase/?layout=publication&revision_id=2505&Itemid=&st=proclip

