The Cityscape and the Climate Emergency

17 November 2020, online event hosted by LCCP as part of London Climate Action Week 2020

Background

When we work in silos on climate change adaptation, we often miss conflicts and tensions that can lead to unintended consequences despite our well-intended actions. We also miss opportunities to do better - to adapt to climate change while addressing a range of other issues like health inequalities and environmental degradation.

This event was a chance to pause and reflect on the challenges, barriers, and opportunities for climate change adaptation in our buildings, the people who live in them, and the spaces between them. We considered the barriers to climate resilience that arise time and again and heard about good ideas from around the world to overcome these. We also captured some of the critical issues to be examined in greater depth in later events. The aim was to bring architects, planners, local council officers, residents and community groups, health sector professionals, and others around the virtual table for a frank discussion about moving climate change adaptation from declarations to action.

Climate change adaptation in the built environment is a wicked problem

Even the concept of "built environment" means different things to different people, and can refer to any number of systems or sub-systems within our cities. And adaptation is about more than just climate and buildings. Ultimately, it's about how safe, healthy, and liveable our cities are for the people living in them. And this has much to do with health and social inequalities that interact with the physical environment to cause risks.

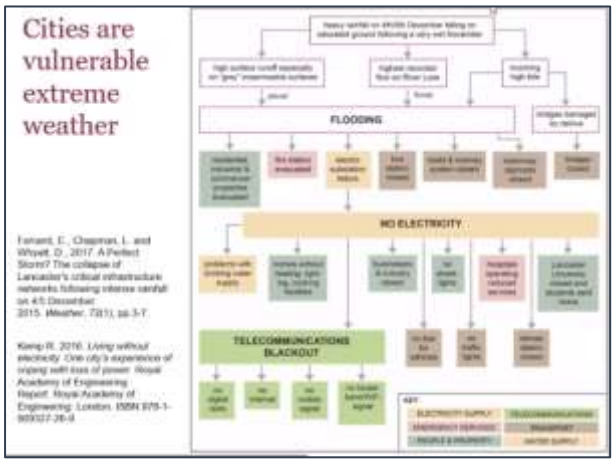
There are also tensions between different priorities that affect climate resilience in our cities: between adaptation and carbon reduction, between adaptation and security, between adaptation and efficiency, and between adaptation and the protection of our ecosystems. When we work in our silos we often don't recognize the wider impacts of our decisions, or think creatively about how to prevent unintended consequences. We also don't see the opportunities to work in ways that have multiple benefits. These opportunities come in recognizing the relationships and the tensions, and can only be realized if we widen the conversation to include perspectives we may never have thought about.

In organizing this discussion, we have been able to reach out to new networks, and the new reliance on remote working and events comes with the benefit of being able to bring people together from across the world, and we were delighted to have colleagues from New York and Lisbon on our panel.

Finally, this event is not meant to be exhaustive and all-encompassing. It is the beginning of a conversation. The point was to set out some of the challenges and identify what needs further exploration in future conversations.

We welcome new voices and ideas to this discussion. Let us know if you'd like to be involved, and what you'd like to see in future events.

Emma Ferranti, University of Birmingham: Impacts of Climate Change in Urban Areas (slides)



Emma set the scene with an overview of what makes cities so challenging to adapt. Extreme weather has a disproportionate impact on urban areas due to high concentration of critical infrastructure and people, dependency on infrastructure networks, and the urban heat island effect.

There is also the impact of interacting risks, for example the coincidence of heat and air pollution, or cascading failures due to infrastructure disruption, as seen in the Lancaster example. Further complications arise because of conflicting priorities and agendas, for example, the need for cooling while also needing to meet net zero targets.

Emma Harvey, Green Finance Institute: Accelerating Finance for Net Zero and Resilient Homes (slides)

Emma said that COP26 would catapult new finance products at asset and portfolio level and financing models that would be highly scalable. Finance is moving toward aligning with good science and decision-making that appropriately accounts for our changing climate to underpin a cleaner, healthier, more just economy.

Property firms could lose more than 9 percent of value due to climate impacts. Green finance is focused on transparency and consistency in disclosure of risks posed by climate and environmental factors and appropriate management of exposure to these risks. It's about mobilising private finance for clean and resilient growth through financial and product

innovation, cross-sector collaboration, and client engagement and education. GFI has a number of financial demonstration projects, including green rental agreements, building renovation passports, and community municipal investments.

Q&A/Discussion:

The GLA published guidance in August for care homes on managing overheating risk, as well as guidance for adapting schools.

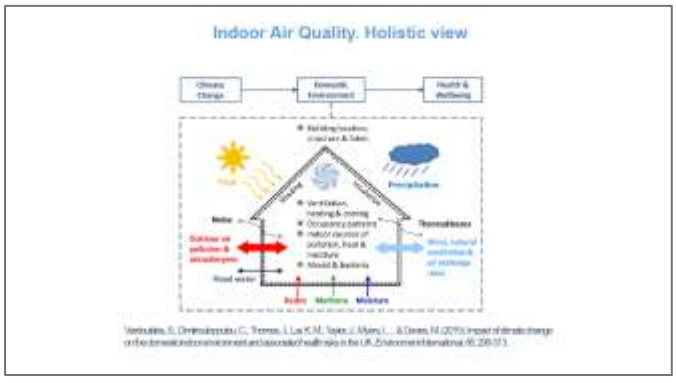
Maintenance of infrastructure needs to be considered. Most of what we will have in 2050 already exists.

It was also noted that rural areas have many of the same challenges – for example, dependency on transport networks.

How would green finance comply with the landlord and tenant act regarding recharge of energy?

Funding for property retrofit like the Green Deal have been tried before and failed for many reasons. Buildings owned by institutions and large rental companies or housing associations may be simpler, but how to mobilize homeowners and pass costs on with buildings when sold?

Monica Mateo Garcia, Birmingham City University: Healthy and Resilient Buildings (slides)



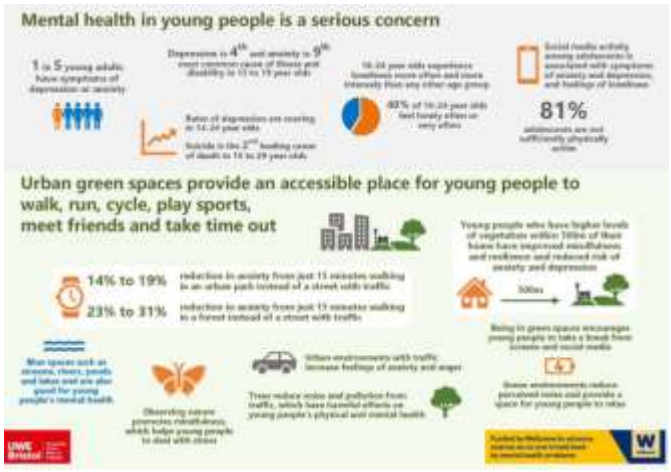
Monica noted that 85 percent of the buildings that exist today will still be here in 2050, while the UK has some of the oldest housing stock in Europe, with some 55 percent of dwellings dating before 1960. As a significant proportion of buildings were built when there was no energy efficiency provision in building regulations, large-scale retrofit will be needed to reduce the UK's energy use and carbon emissions.

However, programmes aimed at improving air tightness and increasing insulation have led to reduced thermal comfort, poor indoor air quality, overheating, and associated dangers. While outdoor air quality receives far greater attention, poor indoor air quality due to inadequate ventilation and factors like building materials and paint, cooking, cleaning products, and pet allergens can lead to health risks for occupants.

Monica's research tries to take a holistic view to address the complexity of interactions in indoor environments and work out what needs to be done. She is working with home

building partners to monitor and record indoor air quality in occupied and unoccupied dwellings across the UK, gathering user feedback on thermal comfort and wellbeing, and using the data collected to inform solutions to improve thermal comfort in a cost-effective way.

Dr. Isabelle Bray, UWE Bristol: The role of access to green space in reducing inequalities in young people's mental health (slides)



This project is one of 30 projects funded by the Wellcome Trust under a programme to look at "active ingredients" in interventions to prevent/treat/manage anxiety and depression among young people.

Urbanisation is a risk factor for poorer mental health, and although the relationship between green space and mental health has been demonstrated in previous research, it has not looked specifically at the category of people aged 14-24. This study aimed to answer the question "In which ways, in which contexts, and for whom does exposure to green space reduce the risk of anxiety and depression among young people aged 14-24 living in urban settings?"

The study found that exposure to forest environments led to greater momentary mental well-being compared to being on an urban street and that urban parks can have similar restorative benefits to forests. Those with higher anxiety levels experienced greater reductions in feelings of depression after walking through forest areas than did people with normal and low level anxiety.

The study made several recommendations, including building opportunities for activities in green spaces into school and college curricula, and found that increasing access to green space is also likely to reduce inequalities, as those with poorer access will benefit the most. Importantly, access to green space helps facilitate other "active ingredients" like sleep, social cohesion, and exercise.

David Ogunmuyiwa, Architects Doing Place: Inclusivity in design

David reflected on the discussion points raised and noted the importance of people with knowledge framing issues in a way that resonates with and has relevance to the people affected by them. There is often a disconnect between academia and practice.

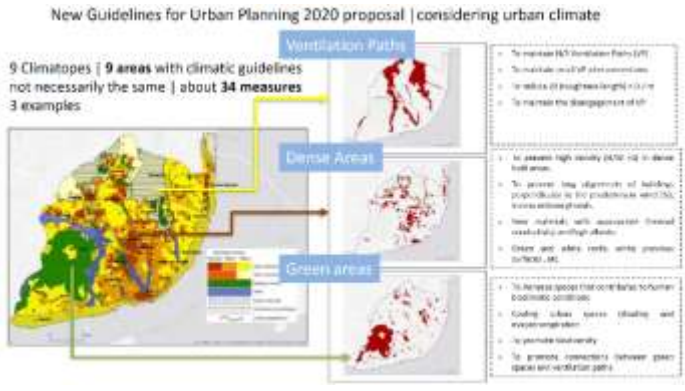
Following on from Emma Ferranti's points about unintended consequences and interacting risks, he pointed to the role of health inequalities and how they play out in our built environment. We are already aware of how air quality has disproportionate impacts on different communities, and have just seen a difficult summer with Black and BAME communities disproportionately affected by COVID-19. The disparity of impacts is not due to any genetic predisposition, but rather to social factors that cause and perpetuate risks. Climate change will exacerbate these inequalities and make some communities more vulnerable.

Challenges:

- Need to create a set of narratives that are meaningful to communities, learn to contextualize for them, and particularly people on low incomes who may not have access to interventions
- Some interventions will require behaviour shifts, for example with building management systems and ventilation
- Need meaningful engagement to earn public support for policy
- Structural challenges for public procurement – misaligned intentions and budgets
- Competing uses of open spaces
- Tradeoffs in design and development – scarcities in urban open space versus more generous ceiling heights

A "Designing for Circularity Primer" document published by the GLA aims to help organisations in the built environment sector understand how they can embed circular economy principles into their projects and design processes.

Antonio Manuel Saraiva Lopes, University of Lisbon: Urban climatopes and climactic services: how to tackle climate change with local solutions (slides)



Antonio is working to develop climate services, providing the data behind methodologies and tools to support climate resilience and low-carbon society, and support new guidelines for urban planning. Among the products are urban heat island assessment maps, which help predict UHI spatial patterns and consider density. Urban density factors take into account building heights, building footprints, and wind directions to predict spatial patterns of the UHI. The maps presented showed changes in urban density from 2005-2020 and a reduction in wind penetration, which has impacts for pollution and thermal comfort.

For Lisbon, nine climatopes have been produced, representing types of areas with different characteristics, including green areas, areas of density, and ventilation paths. These will support urban planning and help consider different aspects of the urban climate, to prevent adverse impacts of development (e.g., closing ventilation paths) and enable healthy and comfortable areas (e.g., through using materials or greening for cooling and other benefits).

An MSc student produced maps and data at the neighbourhood scale in Lisbon in a project called "the climate of my neighbourhood." Using mapping with present and future thermal comfort scenarios, and through online engagement, they were able to engage with a local neighbourhood and gauge interest in the subject and willingness to take action through neighbourhood planning. The goal is to confront citizens with the reality of the climate crisis, but without causing alarm and in ways that help promote healthy lifestyles.

Susanne Des Roches, NYC Offices of Resiliency and Sustainability: Designing for climate and energy resiliency in New York City (slides)

Susanne described the devastation that New York City saw because of Hurricane Sandy and set out the main climate impacts expected by the 2050s. She then talked through how the city is addressing the risks through policy, guidance, and programmes:

- Climate resiliency design guidelines: guidance for key climate criteria for architects, engineers, and planners to use to embed climate projections in capital project design. For example:
    - Sets out how heat and the urban heat island effect will impact facilities, systems, and materials, and provides potential design interventions.
    - Explains precipitation changes and how to incorporate climate change into drainage planning
    - All city capital projects are required to evaluated for coastal flood risk, whether in the current 100-year floodplain or not
    - Contains toolkit for a resilient design process, including an exposure screening tool and risk assessment methodology, cost benefit analysis, and
- More than $1billion spent since Hurricane Sandy on resilience of energy utilities and a community energy planning tool.

Q&A/Discussion

Where is innovation still needed?
Emma Ferranti thought that the planning process needs to be changed to ensure that clean air and climate change are considered at the landscape level.

Monica suggested that interventions to improve indoor air quality need to be affordable, and more cost-effective sensors could help raise awareness and help occupants see how their actions contribute to poor indoor air quality. She also said that the subject could be brought into schools to teach people from a young age.

Susanne noted that New York City has high electricity prices, and there is a need to ensure that people can afford to operate their homes. We should be considering affordability when planning retrofit programmes. In terms of climate risk, the models around how to communicate risks are still underdeveloped in the USA – we need to get better about communicating how climate will impact, and when, and what people can do about it.

Antonio emphasized that new forms of engagement are needed to engage people on urban microclimate and climate change. His work aims to create that engagement.

David said that it's important to connect these ideas and innovation to people's everyday lives. The messages need to mean something to the people we're talking to, and there must be a tangible outcome. It might be just as important to frame in terms of livelihoods and social and economic sustainability as well as environmental sustainability.

About our speakers

Dr. Isabelle Bray
Associate Head of Department for Research and Knowledge Exchange and Senior Lecturer in Public Health
Dr. Isabelle Bray is a public health researcher with an interest in young people's mental health. Previous research has examined relationships between disordered eating, risky behaviours and depressive symptoms. She teaches on the MSc Public Health at UWE and leads the 'Evaluation and Evidence' theme in the Centre for Public Health and Wellbeing

Susanne DesRoches
Deputy Director for Infrastructure and Energy at the New York City Offices of Resiliency and Sustainability.
Susanne DesRoches directs the City's efforts to transition to 100% clean electricity by 2040 as well as to adapt regional infrastructure systems to climate change. Susanne oversees the development of the NYC Climate Resiliency Design Guidelines, and leads the NYC Climate Change Adaptation Task Force, which works to identify climate risks and coordinate adaptation strategies.

Dr. Emma Ferranti
Research Fellow, School of Geography, Earth, and Environmental Sciences, University of Birmingham
Emma's research interests include the impact of weather on infrastructure, green infrastructure, air quality, and GIS. She has a background in geography, earth and environmental sciences, and research experience in academia and consultancy.

Emma Harvey
Programme Director, Green Finance Institute
An experienced and passionate green finance specialist, Emma Harvey joined the Green Finance Institute in 2019 and leads a portfolio of coalitions and projects including the Coalition for the Energy Efficiency of Buildings, an industry-led collaboration with more than 150 individual members, focused on developing new financial products and solutions to help accelerate the decarbonisation of buildings. Emma previously worked across several areas within Barclays Bank including product development, portfolio management and corporate debt structuring. Throughout this period she championed the green finance agenda, supporting the bank's first green bond issuance and pioneering the Barclays green home mortgage.

Robert Huxford (Chair)
Director, Urban Design Group
Robert is director of the Urban Design Group, an international membership charity for people concerned about improving the design of cities, towns and villages. He is co-founder of PRIAN, the Public Realm Information and Advice Network, and a member of the Institution of Civil Engineers Municipal Expert Panel.

Dr. António Lopes
Associate Professor at IGOT-ULisboa, researcher at Centre of Geographical Studies (CEG) and "Climate Change and Environmental Systems – Zephyrus", research group coordinator.

Antonio Lopes holds a PhD in Physical Geography from the University of Lisbon since 2003. Full member of the "F3 - Food Farm & Forestry" College and the Tropical College of the University of Lisbon and Scientific International Associations: International Society of Biometeorology - ISB and International Association of Urban Climate – IAUC. His research topics and techniques: Urban Climate Changes; Applied Climatology; Thermal Comfort and Health, Urban Environment; Atmospheric Pollution in Cities; Micro-meteorology Modelling; Thermal Remote Sensing.
In the last 30 years, Dr. Lopes was involved in national and international projects, among them: FP7 - SECOA - Solutions for Environmental Contrasts in Coastal Areas, National Plan for Territorial Development of Mozambique; Metropolitan Plan for the Adaptation to Climate Change of the Lisbon Metropolitan Area; "The Cape Verde Natural Hazards and Risk Profile of Cape Verde" for the UNPD.

Dr. Monica Mateo-Garcia
Lecturer in Built Environment at the School of Engineering and the Built Environment, Birmingham City University
Dr Monica Mateo-Garcia is an Architect and Lecturer in the School of Engineering and the Built Environment at Birmingham City University. She conducts applied research related to low carbon refurbishment in buildings and healthy indoor environments (looking at indoor air quality and health and well-being of occupants). Dr Mateo-Garcia is a committee member of the UK Indoor Environments Group. She has been invited to speak about resilient and healthy buildings at international conferences and industry events. She is presently supervising two PhD's in Indoor Air Quality and overheating in new homes, partially funded by housing developers.

David Ogunmuyiwa
Principal, Architects Doing Place
David Ogunmuyiwa B.Sc(hons), BArch(hons), DipArch(UCL) RIBA ARB is an architect, public appointee, lecturer, and writer. He is noted for his origins as a housing officer – both for housing associations and in some of London's most challenged boroughs, including Lambeth, Southwark, and Tower Hamlets – before retraining as an architect and helping to deliver highly decorated schemes including for housing, education, and the arts. He is an expert on the delivery of infill regeneration in deprived environments with diverse stakeholders. David combines practice with teaching architecture and has taught at Portsmouth University, Central Saint Martins, University of the Arts London, and the Stephen Lawrence Charitable Trust. He holds a number of strategic advisory roles, using his expertise to contribute to architecture, urban design and housing standards policy across London and the UK. He is a Mayor's Design Advocate for London and member of Historic England's Expert Advisory Group focusing on adaptive reuse of historic assets. He was a curatorial panel member for the London Festival of Architecture, is a board member of Urban Design London and an advisory board member for New Architecture Writers, a programme which trains diverse architectural writers, commentators, and critics. David is an alumnus of the Clore Foundations Cultural Leadership Programme, aimed at strengthening leadership across the arts. He mentors widely including for Public Practice, the Royal College of Art, and Haverstock Careers Network. He has practiced architecture in the UK and the Middle East and is a confirmed urbanist.