Underpinning CIBSE's advice and guidance on adapting buildings to climate change

July 2013

THE ARCC COORDINATION NETWORK

The performance of UK buildings and infrastructure is critical to our national well-being and economic stability. To ensure policymakers and practitioners have the best available evidence on which to base decisions in these sectors, the EPSRC is investing heavily in research to improve resilience in the urban environment. This includes projects within the Adaptation and Resilience in a Changing Climate (ARCC) programme and the overarching Coordination Network (ARCC CN). By engaging research projects and a wide range of national, regional and local stakeholders, the ARCC CN maximises and accelerates the use of outputs from across the academic community to inform the development of a more sustainable built environment. Working directly with professional bodies such as The Chartered Institution of Building Services Engineers (CIBSE) ensures that Network outputs are used effectively to inform guidance and information provided to professional institutions to inform their broader membership.

THE CHARTERED INSTITUTION OF BUILDING SERVICES ENGINEERS (CIBSE)

ONLINE CIBSE STRATEGIC PLAN 2011–16

CIBSE is an international body that represents and provides services to around 20,000 members of the building services profession. It sets standards for building services engineering and publishes guidance and codes, recognised internationally as setting best practice for the profession, is consulted by government on construction, engineering and sustainability issues and provides advice on the UK's Building Regulations.

One of the objectives in CIBSE's strategic plan is to play a major role in understanding the issues arising from climate change and in defining mitigation and adaptation measures for the built environment, "We have the potential to make a major contribution to sustainability through our international membership, professional standing and knowledge base.

Its Climate Task Force (CTF) was established to address the availability of weather data and advice offered by CIBSE in support of more sustainable and resilient design solutions. CIBSE provides hourly weather series - Test Reference Years (TRYs) and Design Summer Years (DYS) – that building designers can use for energy and overheating assessments and to inform clients of the likely performance of a building throughout its lifetime.

CIBSE's core guidance publication, Guide A: Environmental Design, referred to in Part L of the Building Regulations as best practice guidance, is used for sizing systems and for assessing overheating. The Guide has been under revision during 2012/3 (due for publication early 2014) which provided an excellent opportunity to revise its advice on adapting to climate change based on ARCC outputs.

WORKING WITH PROFESSIONAL INSTITUTIONS

Four ARCC projects (PROMETHEUS, PROCLIMATION, COPSE and Low Carbon Futures) undertook research supporting CIBSE activities and CIBSE were actively involved in each project as a major stakeholder. Through the agency of ARCC CN, the projects were invited to join the CTF, to present their outputs and to provide proposals for updating current CIBSE knowledge. This resulted in a paper published by the Building Services Engineering Research and Technology journal (BSER&T) introducing a new methodology for revising DSYs. Further work focused on using the UKCP09 Weather Generator to produce new weather series for building simulations under both current and future weather conditions.

COPSE: Co-incident probabilistic climate change weather data for a sustainable environment

PROMETHEUS: The use of probabilistic climate data to future proof design decisions in the buildings sector

LUCID: the development of a local urban climate model

KTP: Knowledge Transfer Partnership

EngD: Engineering Doctorate

Members of six ARCC projects (as above plus LUCID and SCORCHIO) have been members of the CIBSE Steering Group for the revision of Chapter 2 of Guide A on 'External design data'. The Group looked at the best way to incorporate climate change and Urban Heat Island effect information. Projects have also made contributions to CIBSE events: 'The future of weather data' and 'Summertime overheating'. Both membership events were fully booked and offered a valuable opportunity for information exchange between ARCC, CIBSE and the building services industry.

ARCC CN projects also contributed to a special issue of BSER&T on the practical use of UKCP09 projections in the built environment, published spring 2012. Seven papers were commissioned on the challenges and opportunities offered by UKCP09 projections for enhancing the capacity for using probabilistic information in building services practice, policy and standards.

Two CIBSE/UKCIP/ARCC Knowledge Transfer Partnerships have also successfully advanced CIBSE guidance on adapting buildings to climate change. The first developed a framework for the use of weather data and climate change information in the design of buildings to increase their resilience. The second translated UKCP09 for use by building professionals in their decision-making processes. A current EngD, linked with LUCID, is looking at how climate change will impact the wider urban climate.

All these activities ensured targeted and very specific evidence from across ARCC research projects contributed to updating and disseminating CIBSE weather data, advice and best practice guidance on environmental design.

THE VALUE OF COORDINATED RESEARCH-BASED EVIDENCE TO CIBSE

Collaboration with ARCC CN has greatly benefited CIBSE's activities and has created strong links with the network's broader research and stakeholder communities. The placement of a technical expert working in both organisations has maximised the uptake of ARCC outputs at CIBSE by informing the translation of research outputs for use in the industry and by identifying appropriate dissemination routes. The collaboration has also ensured CIBSE involvement in the scoping of EPSRC research calls to meet existing and evolving industry needs. It has provided CIBSE with direct access to new information to update its publications and on-line resource (the Knowledge Portal), with links to an expanded pool of researchers who are skilled authors, referees, steering group members and presenters able to contribute to CIBSE activities, and with possible opportunities for future research collaborations.

FOR THE FUTURE

The collaboration with CIBSE continues to evolve. The ARCC CN is broadening its focus to include adaptation and resilience to a range of drivers of change, not just climate change, while CIBSE may wish to expand its remit to include advice based on new areas of research from the ARCC CN, for example, on master-planning, urban systems and infrastructure vulnerabilities.

Working with professional bodies has been shown to be a highly effective and efficient way of guiding and translating research to ensure it meets a wide range of end-user requirements. The ARCC CN will continue to seek new opportunities to collaborate with such bodies in the infrastructure and built environment sectors.

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FURTHER INFORMATION

CIBSE Guide A: Environmental Design

BSER&T (2012) Special issue - Adaptation and resilience to a changing climate: Supporting adaptation decision making, 30 (1)