

Design for Future Climate

“Building a Resilient Future” 26 February 2014

Climate Change Adaptation essential reading

The following documents have been included on the Building a Resilient Future conference memory stick:

Design for future climate – opportunities for adaptation in the built environment, Bill Gething report (2010)

Design for future climate: adapting buildings competition final project factsheets (2014)

Design for Climate Change – Chapter 1, Bill Gething and Katie Puckett (2013).

The full report is available from the RIBA website: <http://www.ribabookshops.com/item/design-for-climate-change/77532/>

MBE KTN in collaboration with Climate Ready reports:

- Guidance for making the case for climate change adaptation in the built environment
- Climate Change Adaptation Survey Results
- Design for Future Climate Change Survey Results

IPCC Fifth Assessment Report: Climate Change (2013)

The National Adaptation Programme – Making the country resilient to a changing climate

Business Green Insight Report - Is UK PLC climate ready?

Climate change and innovation in house building: designing out risk, NHBC Foundation(2007)

Climate Change Adaptation links to useful websites

Adaptation and Resilience in the Context of Change Network – ARCC CN

<http://www.arcc-network.org.uk/>

Climate Ready

<http://www.environment-agency.gov.uk/research/137557.aspx>

Climate UK

<http://climateuk.net/>

Committee on Climate Change – Adaptation sub committee

<http://www.theccc.org.uk/>

MBE KTN – Climate change adaptation – please note you may have to sign in to access some of this content

<https://connect.innovateuk.org/web/climate-change-adaptation>

Design for future climate – project team’s full reports - please note you may have to sign in to access some of this content

<https://connect.innovateuk.org/web/design-for-future-climate/documents? 20 folderId=3713092& 20 displayStyle=icon& 20 viewEntries=1& 20 viewF>

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National Adaptation Programme - Adapting to climate change

<https://www.gov.uk/government/publications/adapting-to-climate-change-national-adaptation-programme>

UK CIP

<http://www.ukcip.org.uk/>

The following tables provide links to further information on relevant guidance, toolkits and research.

Table 1 – Guidance on climate change adaptation for the built environment

Guidance	Target audience	Published	Description	Publisher	URL
<i>The business case for include adaptation measures in retrofits</i>	Social landlords	2014	<i>The Business Case: Incorporating adaptation measures in retrofits outlines the financial case for adaptation – including a breakdown of costs and benefits, as well as identifying the best opportunities for funding.</i>	London Climate Change Partnership	Here
<i>Climate Action in Megacities 2.0 Executive Summary and Chapter 7</i>	Polymakers and Built environmental professionals	2014	<i>The 2014 report analyses mayoral powers and identifies major trends across sectors and geographies, demonstrating that cities have the power, the expertise, the political will and the resourcefulness to continue to take meaningful climate action</i>	Arup	Here
<i>Your social housing in a changing climate</i>	Polymakers & housing professionals	2013	<i>The guide focuses on adaptation techniques used for two social housing blocks in the London Borough of Barking and Dagenham (LBBD). It was set-out to explore the findings of the large-scale test and examine the particular situation for social landlords.</i>	London Climate Change Partnership	Here
<i>Two Degrees: The Built Environment and Our Changing Climate</i>	Built environmental professionals	2013	<i>Two Degrees reviews the outcomes that may occur if the earth's temperature rises at its current rate, and lays out a roadmap for keeping global temperature rise to less than 2 degrees centigrade.</i>	Arup	Here
<i>Water Climate Change Impacts Report Card</i>	Water industry and others interested on the effects of water in the UK	2013	<i>The report card looks at the effect of climate change on fresh water - including rainfall, floods and droughts. The report card is intended to help people understand the scale of possible change and to help inform decisions about the way that water is managed.</i>	LWEC	Here
<i>Toolkit for Resilient Cities. Infrastructure, Technology and Urban Planning:</i>	Decision Makers for cities	2013	<i>The report especially explores the role of technology in enhancing the resilience of cities and their critical infrastructure systems, and the enabling actions that can support a new approach to system design and</i>	A research project carried out by Arup, RPA and Siemens	Here

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Urban Climate Change Preparedness Score	Decision Makers	2013	<i>Ambitious targets for adaptation and mitigation, whether set by local, national or global policy makers imply substantial challenges for urban areas and their infrastructure. As part of an European Science Foundation funded COST Action (TU0902: Integrated assessment of urban areas) it investigates the climate change strategies of 30 UK urban areas. To aid decision-makers we considered how well they were performing through the development of an Urban Climate Preparedness Score.</i>	Newcastle University Here
“Its’ Alive!”	Built environmental professionals	2013	<i>The study, undertaken by Arup’s Foresight + Innovation team, foresees that structures will be fully integrated into the fabric of the city, responsive to changes in the external environment, and designed for continuous adaptability, according to real-time needs and demands of its users.</i>	Arup Here
Adaptation - Design for Future Climate	Architects, engineers	2010	<i>Describes why, when and how to use climate change adaptation designs. Additional information is given on related or conflicting strategies as well as links to further guidance.</i>	RIBA Here
Assessing the differences – UKCIP02 & UKCP09	Designers	2009	<i>A guidance note which provides background information for users who need to evaluate earlier work that used UKCIP02.</i>	Adaptation Scotland & UKCIP Here
Climate Adaptation - Guidance on insurance issues for new developments	Developers, insurers, planning authorities	2009	<i>Sets out to inform developers and planning authorities on how to prepare new developments for climate change and the risk issues that are prevalent with them.</i>	Association of British Insurers Here
The Use of Climate Change Scenarios for Building Simulation: The CIBSE Future Weather Years	Designers	2009	<i>In collaboration with ARUP this publication provides guidance and tools for considering climate change adaptation in building design using a range of modelled future weather data.</i>	CIBSE Here
Your home in a changing climate: retrofitting existing homes for climate change impact	Polymakers, funding agencies & suppliers	2008	<i>The guide focuses on informing and promoting adaptation of an existing residential building stock covering dwellings from private individuals to housing associations, with an emphasis on water conservation, drainage, flood risk and ventilation.</i>	Three Regions Climate Change Group Here
Adapting to climate change: case study companion guide	Planners & developers	2007	<i>Accompanies Adapting to climate change: a checklist for development.</i>	Three Regions Climate Change Group Here
Climate Change Adaptation by Design guidance	Planners, developers, designers	2007	<i>Shows how adaptation can be integrated into the planning, design and development of new and existing communities.</i>	TCPA Here
Climate change and innovation in house building: designing out risk	Contractors, clients, developers, insurers	2007	<i>Sets out design principles on climate change and zero carbon initiatives for homes enabling builders, developers, insurers and lenders to have greater confidence in innovations in technology.</i>	NHBC Foundation Here
Climate change	Designers	2005	<i>The guide addresses some key</i>	CIBSE Here

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<i>and the indoor environment: impacts and adaptation</i>			<i>issues on thermal discomfort and comfort cooling strategies in buildings. Dynamic thermal computer modelling of 13 case study buildings provide evidence and illustrate a range of different approaches to comfort cooling provision.</i>		Here
<i>Adapting to climate change: a checklist for development</i>	Planners & developers	2005	<i>Provides a checklist summarising important climate issues that need to be considered when planning a development, as well as guidance. It covers location, site layout, building design, structure, envelope and materials, ventilation and cooling, drainage, water, outdoor spaces and connectivity.</i>	Three Regions Climate Change Group	Here
<i>Beating the Heat: Keeping UK Buildings Cool in a Warming Climate</i>	Planners, developers, planning authorities	2005	<i>This guidance note identifies a range passive cooling adaptation options, in terms of their effectiveness, and demonstrates how carbon neutral, low energy buildings can be designed.</i>	UKCIP	Here
<i>Climate change risks in construction – an introduction</i>	Engineers, consultants, clients, local authorities	2005	<i>Provides a method for assessing the risk that should help designers and constructors to make rational decisions about whether to incorporate climate change consequences in their projects.</i>	CIRIA	Here

Table 2 – Tools on climate change adaptation for the built environment

Tools	Target audience	Completed	Description	Provider	URL
<i>Adapting Dwellings to Climate Change - Retrofit Advice Tool</i>	Developers & designers	2011	Developed to assist when choosing retrofit adaptations to reduce dwelling overheating during heat wave periods, whilst also considering the effect on annual heating energy use and cost.	CREW Project Team	Here
<i>GRaBS Assessment Tool</i>	Planners, developers	2011	<i>The tool is designed as a platform to display spatial data and provide information to aid climate change adaptation planning and decision-making.</i>	EU Regional Development Fund	Here
<i>PROMETHEUS</i>	Designers	2011	<i>The building industry use PROMETHEUS weather data to adapt new and existing building designs to climate change. The files cover a range of weather and emissions scenarios up to 2080 and were created using outputs of the UKCP09 Weather Generator.</i>	ARCC CN	Here
<i>Climate Change Toolkits – 2nd Edition</i>	Architects	2011	<i>A series of climate change toolkits, giving RIBA members an introduction to the science and issues behind global warming, and the technical skills, tools and design solutions necessary to tackle climate change.</i>	RIBA	Here
<i>The CIBSE Future Weather Years Data</i>	Designers	2009	<i>A tool for considering climate change adaptation in building design based on a range of modelled future weather data from UKCP09 projections</i>	CIBSE	Here
<i>UK Climate Projections</i>	Designers	2009	<i>Provides climate information designed to help those needing to plan how they will adapt to a changing climate. The data is focussed entirely on the UK, and is free of charge.</i>	MET Office	Here
<i>Design Compass</i>	Designers	2008	<i>Online tool to assist professionals involved in building design to incorporate weather/climate related information into a clearly defined framework.</i>	CIBSE	Here
<i>Adaptation</i>	Planners,	Continual	<i>Provides information from the latest research</i>	UKCIP	

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Wizard	<i>developers & designers</i>	<i>projects covers a wide range of sectors and helps anyone wanting to develop an adaptation strategy.</i>	Here
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Table 3 – Previous research relating to climate adaptation and the built environment

Title	Period during	Description	Provider	URL
<i>Built Infrastructure for Older People in Conditions of Climate Change (BIOPICC)</i>	2009 -12	<i>The research was aimed at developing a methodology for selecting locally sensitive, efficient adaptation strategies during the period up to 2050 to ensure that the infrastructures and health and social care systems supporting well-being of older people (i.e., those aged 65 and over) would be sufficiently resilient to withstanding harmful impacts of climate change.</i>	EPSRC	Here
<i>Suburban neighbourhood adaptation for a changing climate (SNACC)</i>	2009 -12	<i>Research focused on adaptations to the built environment, through changes to individual homes and larger neighbourhood scale adaptations (urban re-design).</i>	EPSRC	Here
<i>UK Climate Projection 2009 (UKCP09)</i>	2009	<i>UKCP09 is one of a number of tools available from UKCIP and, together with UKCIP02, helps decision-makers to take account of climate change based on present and future climate projections.</i>	DEFRA	Here
<i>Design Of Water Networks using Probabilistic Prediction (DOWNPIPE)</i>	2008 -12	<i>The research focussed on realising the potential benefits to property drainage design and adaptation as facilitated by the use of probabilistic-based UKCP09 data.</i>	EPSRC	Here
<i>The use of probabilistic climate data to future proof design decisions in the buildings sector (PROMETHEUS)</i>	2008 -11	<i>A methodology was developed for the creation of probabilistic future weather years compatible with common building simulation software and a methodology for estimating wind direction and speed.</i>	EPSRC	Here
<i>The use of probabilistic climate scenarios in building environmental performance simulation (PROCLIMATION)</i>	2008 -11	<i>The project investigated the use of probabilistic climate projections in energy modelling of the built environment to inform the building energy research community and the Chartered Institute of Building Service Engineers (CIBSE).</i>	EPSRC	Here
<i>Coincident Probabilistic climate change weather data for a Sustainable built Environment (COPSE)</i>	2008 -11	<i>The research aim was to develop a methodology for providing the weather data so that the building community could make informed decisions about new and existing buildings.</i>	EPSRC	Here
<i>Community Resilience to Extreme Weather (CREW)</i>	2008 -11	<i>Research focussed on the developing a set of tools for improving the capacity for resilience of local communities to the impacts of extreme weather events.</i>	EPSRC	Here
<i>Sustainable Cities: Options for Responding to Climate Change Impacts and Outcomes (SCORCHIO)</i>	2007 -10	<i>This project furthered the ASSCUE project and was set-up to develop tools that used the latest climate projections to help planners, designers, engineers and users to adapt urban areas, with a particular emphasis on heat and human comfort</i>	EPSRC	Here
<i>Adaptation Strategies for Climate Change in the Urban Environment (ASCCUE)</i>	2003-2006	<i>The project aimed to further our understanding of the impacts of climate change on towns and cities through three ‘exposure units’ of human comfort, urban greenspace and the built environment.</i>	EPSRC	Here
<i>UK Climate Impact projections 2002 (UKCIP02)</i>	2002	<i>The UKCIP02 climate change scenarios provided a common starting point for assessing climate change vulnerability, impacts and adaptation in the UK.</i>	UKCIP	Here