School of Construction Management and Engineering

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Low Carbon Plans and Strategies for UK Cities: The 'Vision Thing'

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Cities can be relatively ‘carbon efficient’

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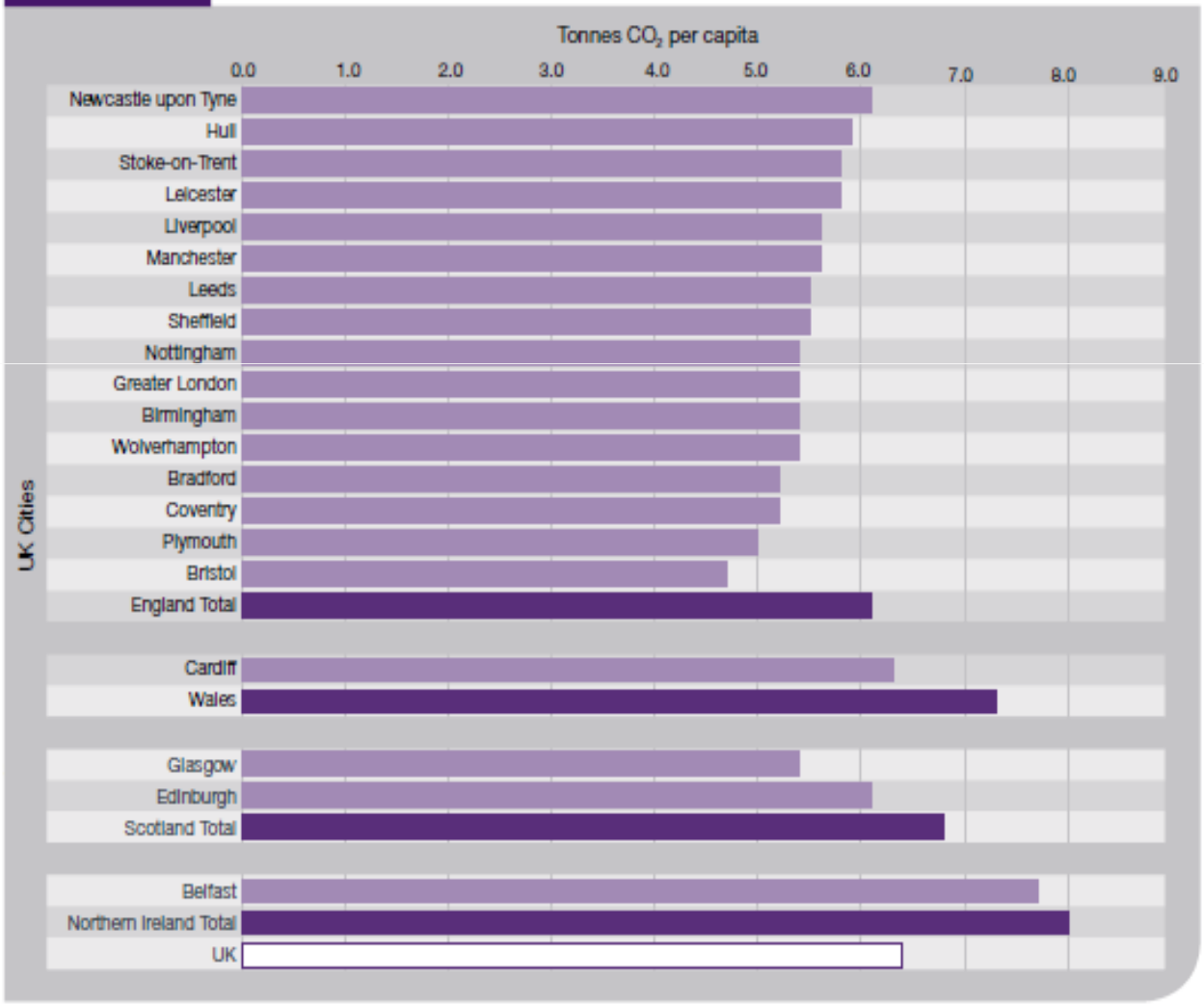
Figure 3.5 Per capita CO_2 emissions, 2009: Top 20 UK Cities



Source: DECC, 2011e

Why do we need low carbon plans and 'visions' for cities?

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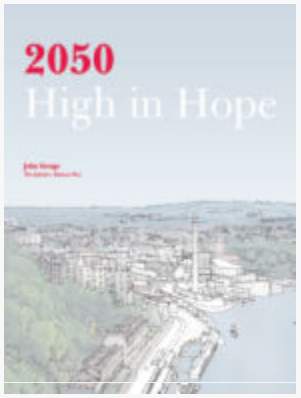
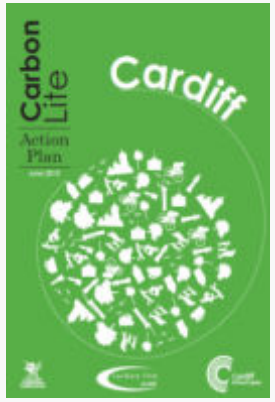
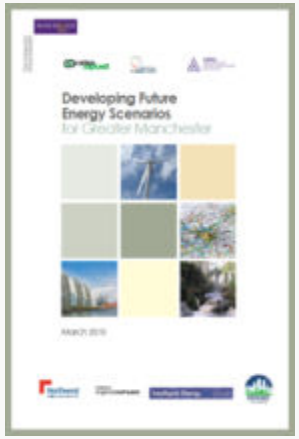
- Sense of purpose
- Vitality and belief systems
- What sort of future do we want?
- Promote discussion and debate
- Mobilise resources around desired futures

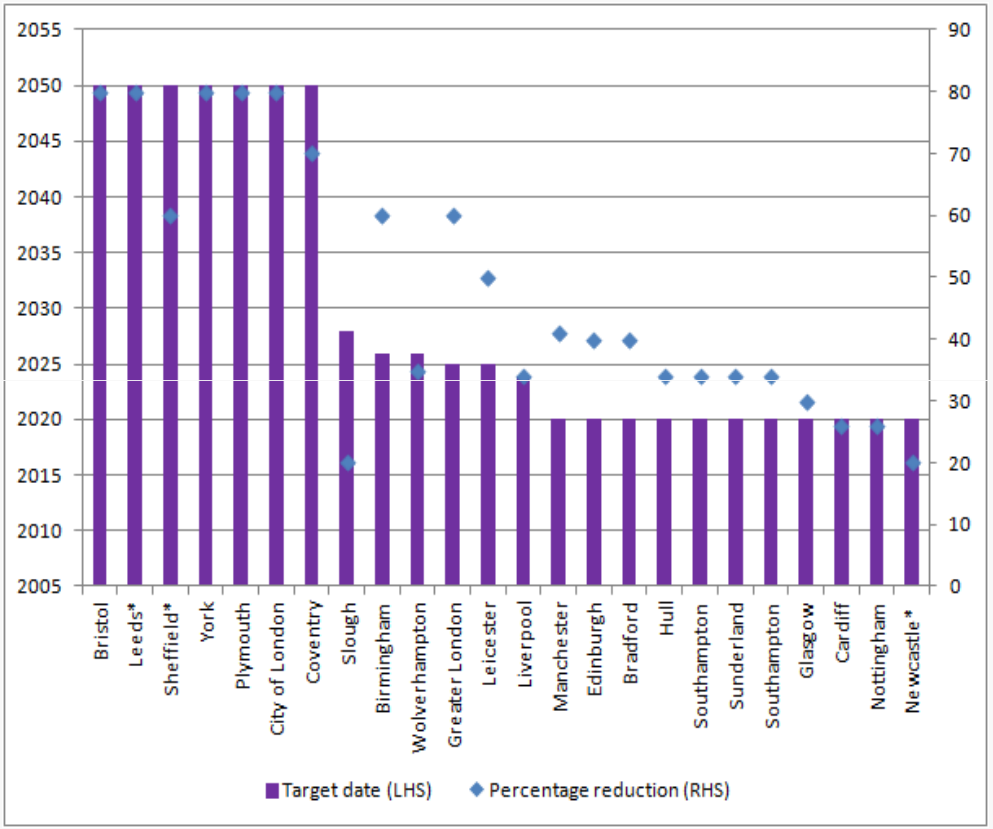






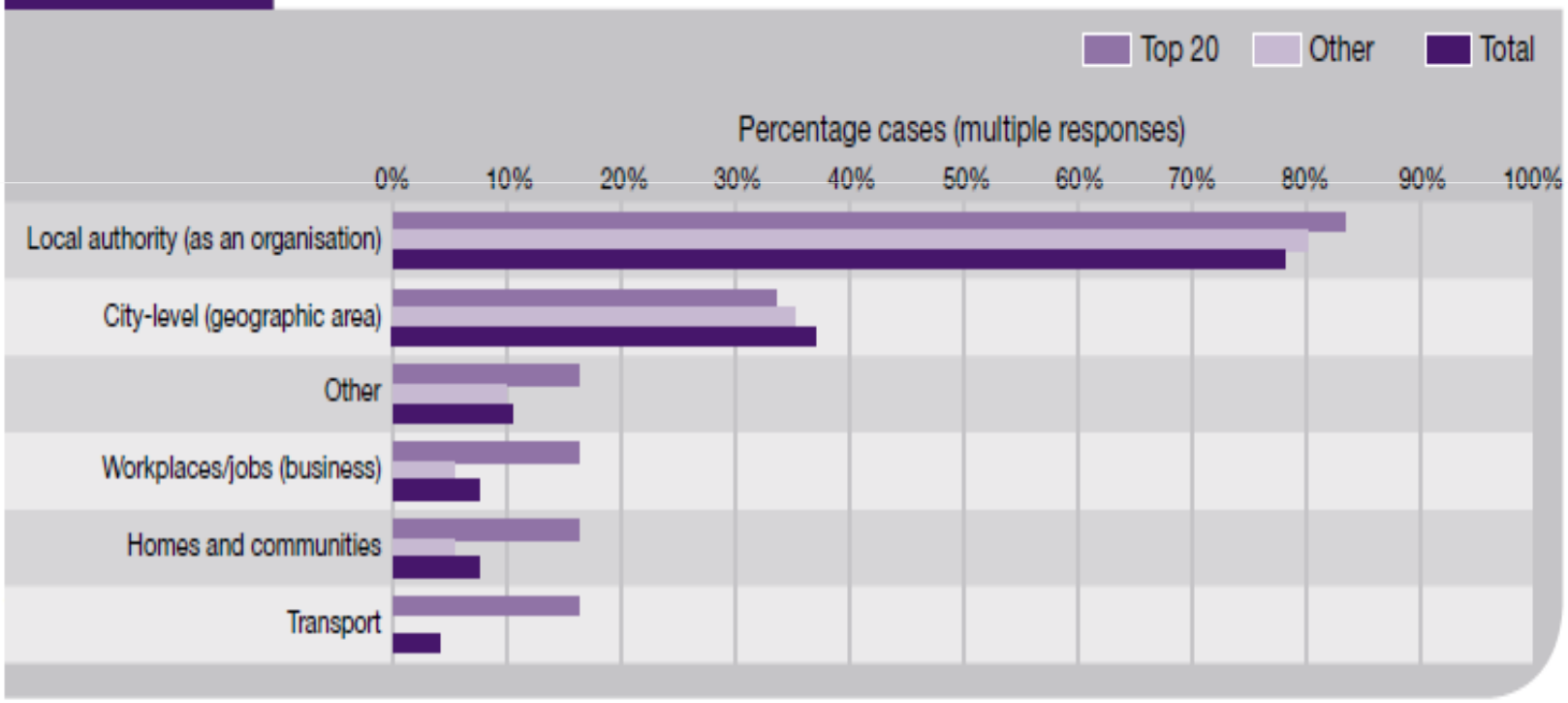
Progress?: Low Carbon Plans

- 65% of cities had climate change action plans and 25% had specific low carbon action plans
- UK cities - wide range of targets.
  - 7 UK cities had 2050 targets in place, 6 of which are in the Top 20 cities.
- In Top 20 UK cities where a plan and target were both present, the overall reduction in carbon emissions between 2005 and 2009 was **higher** than where such plans and targets were absent.
- Top 20 UK cities tend to have **longer timescales** for their plans in comparison with other cities, which tended to have medium term plans.

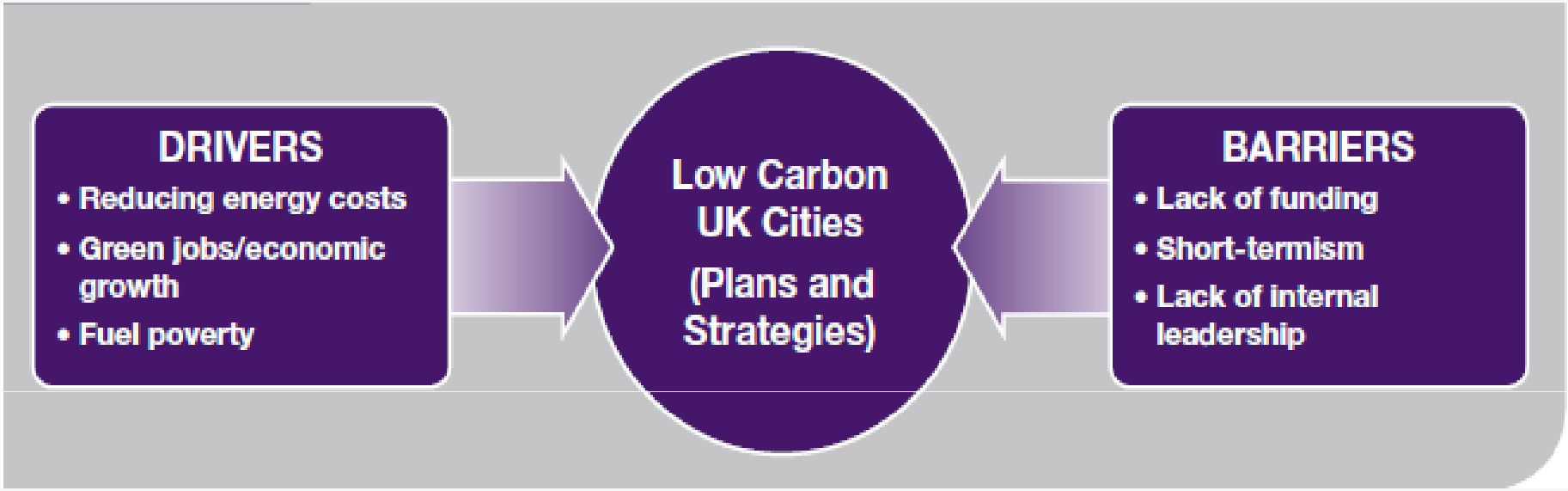


Sectoral targets?

Figure 4.8 Low carbon action plans and strategies: sectoral targets by type of city

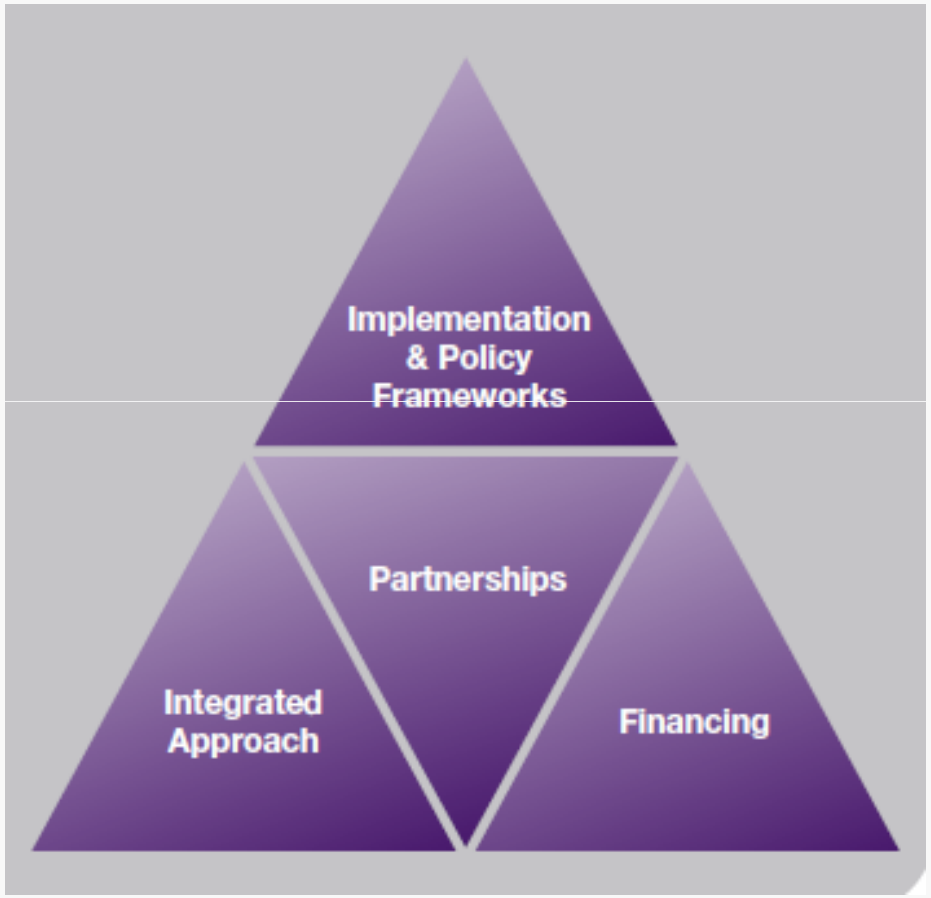


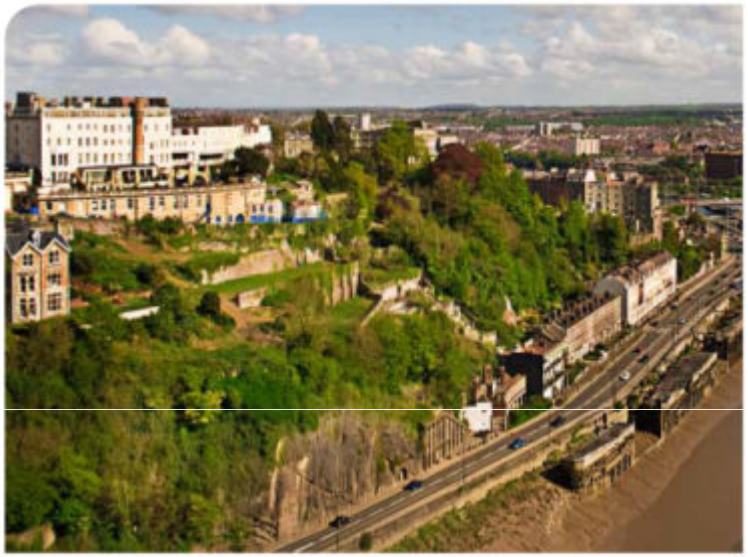
Drivers and Barriers



- Further uncertainty:
  - NI186 – removal of need to monitor
  - Localism
  - Green Deal

Emerging best practice





Bristol, UK[19]	
Population	426,100 (N186 local authority, 2009)
City Carbon Target	26% reduction by 2015, 40% by 2020, 80% by 2050 (overall)[20]
Current performance (per capita reduction, 2005–09)[21]	-20% (-5.4%pa)
Main achievements	A leading UK green capital - shortlisted for EU Green Capital Award in 2009. Carbon strategy in place since 2003 titled Climate Protection and Sustainable Energy Strategy 2003 - 2010 and Climate Change and Energy Security Framework from 2010 onwards. Peak Oil Report published in 2009 and Who Feeds Bristol Report published in 2011.
Actions	Planning policy framework for new developments; West of England Joint Local Transport Plan, city-wide electric vehicle charging points scheme, proactive programme to engage with energy utilities to lever in investment in private housing, energy and resource efficiency programmes for business, supporting eco-innovation, green skills development, comprehensive programme of investment in council housing, municipal buildings (including schools), street lighting, contracts, fleet management (thermal) strategy for council owned housing. Newly commissioned work includes Hydrogen Strategy development and Smart City project bids. Pilot study with DECC on Low Carbon Framework (see Plymouth) including City-wide roof assessment for solar arrays, linked to publicly accessible solar map (to be launched).
Challenges and strategies	Addressing the combined drivers of climate change, peak oil and the recession. City-level 'Climate Change and Energy Security Framework' in place (2010).

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City Visions: EPSRC Retrofit 2050

	Smart-Networked City	Compact City	Self Reliant-Green City
Overview	The city as a hub within a highly mobile and competitive globally networked society.	The city as a site of intensive and efficient urban living. Urban land-use, buildings, services and infrastructure provision are optimised in order to create dense urban settlement forms.	The city as a self-reliant bio-region, living in harmony with nature.
Change in land-use and urban form	**Low – moderate**	**Moderate** (densification)	**High** (extensification)
Social Values & Institutions	***Market*** oriented values, with emphasis on private consumption	***Communitarian*** and localist values	***Cooperative*** and collectivist values
Economic Growth	3.0% pa	2.3% pa	<1.6% pa
UK Population by 2050	86.4 million	76.4 million	66.8 million
Urban Density (2050) (assuming a large city)	No significant change 40 dwellings per ha (or 160 people/ha)	Dense 70 dwellings per ha (or 275 people/ha)	Less dense 30 dwellings per ha (or 120 people/ha)

Note: Under each of the visions we start with a working assumption that the UK will meet its 80% carbon reduction target by 2050 (against a 1990 baseline), alongside very significant improvements in water use and waste and resource efficiency.

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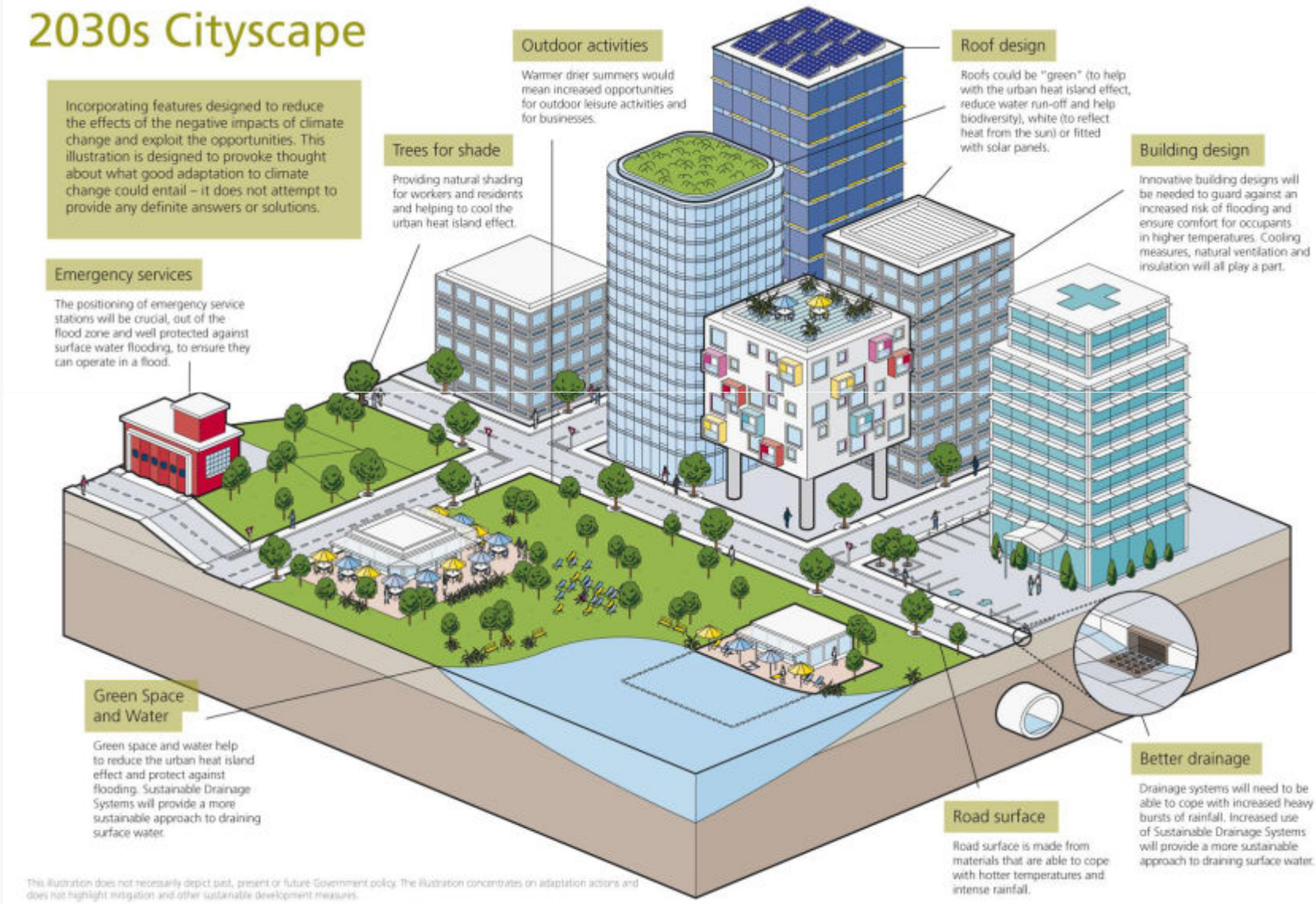
2030s Cityscape

Incorporating features designed to reduce the effects of the negative impacts of climate change and exploit the opportunities. This illustration is designed to provoke thought about what good adaptation to climate change could entail – it does not attempt to provide any definite answers or solutions.



Outdoor activities

Warmer drier summers would mean increased opportunities for outdoor leisure activities and for businesses.

Roof design

Roofs could be "green" (to help with the urban heat island effect, reduce water run-off and help biodiversity), white (to reflect heat from the sun) or fitted with solar panels.

Trees for shade

Providing natural shading for workers and residents and helping to cool the urban heat island effect.

Building design

Innovative building designs will be needed to guard against an increased risk of flooding and ensure comfort for occupants in higher temperatures. Cooling measures, natural ventilation and insulation will all play a part.

Emergency services

The positioning of emergency service stations will be crucial, out of the flood zone and well protected against surface water flooding, to ensure they can operate in a flood.

Green Space and Water

Green space and water help to reduce the urban heat island effect and protect against flooding. Sustainable Drainage Systems will provide a more sustainable approach to draining surface water.

Road surface

Road surface is made from materials that are able to cope with hotter temperatures and intense rainfall.

Better drainage

Drainage systems will need to be able to cope with increased heavy bursts of rainfall. Increased use of Sustainable Drainage Systems will provide a more sustainable approach to draining surface water.

This illustration does not necessarily depict past, present or future Government policy. The illustration concentrates on adaptation actions and does not highlight mitigation and other sustainable development measures.

Policy implications

- UK Cities:
  - Fully integrated plans
  - Set shared targets at city level and sectorally
  - Plan and monitor
- UK Government:
  - 'Low carbon city' framework
  - 'Local carbon plans'
  - Funding issues in era of austerity

http://www.scottishpolicynow.co.uk/article/a-planet-of-smart-cities-scotlands-digital-challenge

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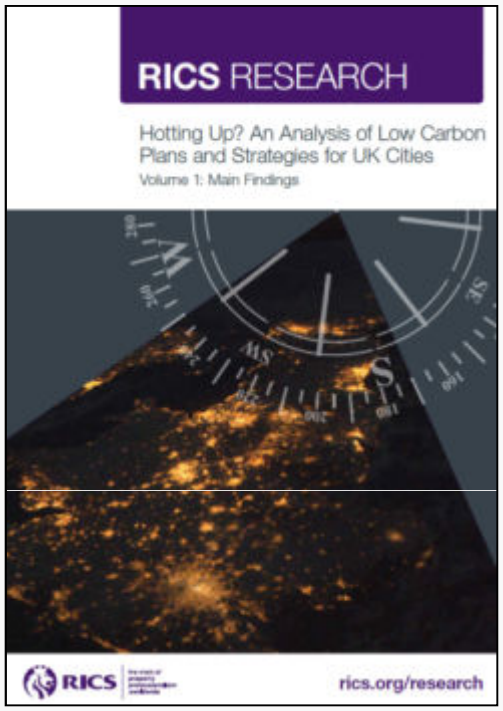
Thank You!

- Further information: t.j.dixon@reading.ac.uk
- Committee on Climate Change: http://www.theccc.org.uk/
- EPSRC Retrofit 2050: www.retrofit2050.org.uk



Retrofit2050