Edge Debate No 38, Tuesday 28 October 2008

Are you dwelling comfortably?:
the need to re-define comfort in buildings

Comfort in a Lower Carbon Society

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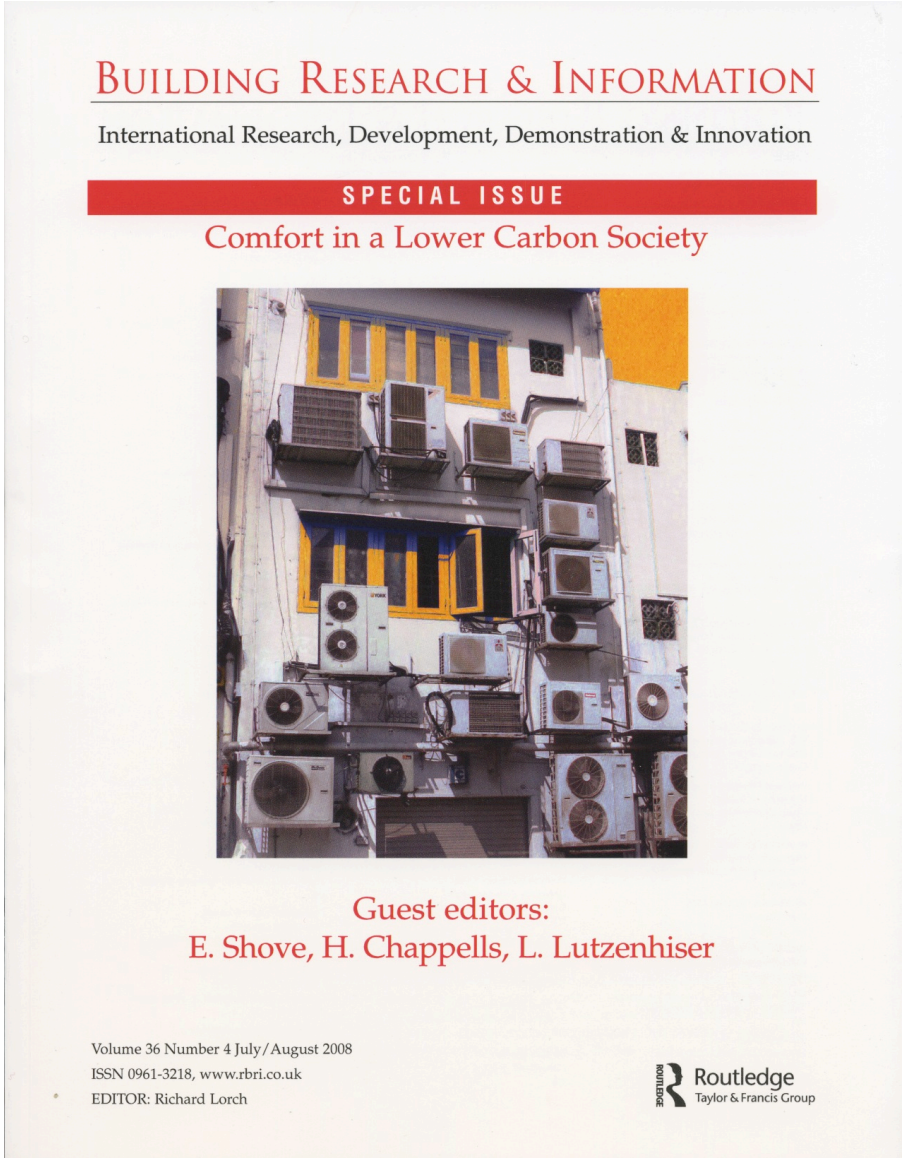

BRI, July 2008

The carbon challenge (1)

- USA: Architecture 2030

  The fossil fuel reduction standard for all new buildings shall be increased to:

  -60% in 2010

  -70% in 2015

  -80% in 2020

  -90% in 2025

  Carbon-neutral in 2030 (using no fossil fuel GHG emitting energy to operate).

The carbon challenge (2)

- UK Code for Sustainable Homes:
  "carbon neutral" new homes by 2016

- UK Dept of Energy & Climate Change:
  80% GHG reduction by 2050 (based on 1990 levels)

Climate change

"While the public eye is largely focused on climate changes occurring in the outside environment, it is the indoor environment which has experienced the biggest temperature change in the past century."

(Chappells & Shove, 2005)

"Most people are tolerating a narrower temperature band [than 6-30^{o}C], as well as rejecting former ways of achieving comfort, such as opening windows, taking showers or baths, using blankets and appropriate clothing, building thermally efficient housing, or taking siestas on hot afternoons."

Options for Buildings (1)

- Improved technical efficiencies
  (within buildings and alternative energy sources)

- Improved management / conservation
  (use less, use more wisely)

- Altered expectations and behaviour
  (less consumerist approach to ‘comfort’)

Options for Buildings (2)

Multiplier Effect (Bordass, 2001)

1. Halve the demand *(attitudes, standards, passive measures)*.
   TIMES
2. Double the efficiency *(equipment, controls, waste avoidance)*.
   TIMES
3. Halve the carbon in the energy supplies *(by on- and off-site measures)*.
   EQUALS
4. one-eighth of the carbon (87% reduction)

Buildings

- Improved technical efficiencies

-> revenge effects from efficiency through inadvertently justifying and legitimizing continued / increased use of heating and cooling devices, albeit more efficient ones

Making air conditioners more efficient:

"the government is tacitly accepting and in a way legitimizing a solution the widespread adoption of which would lead to an increase in energy consumption" (Shove 2004)

- Or 'new' technologies -> unintended consequences:

A/C in mobile environments can "significantly undermine improvements in energy efficiency." (Parkhurst & Parnaby, 2008)

Challenge for the building stock

How to expand the range of indoor temperatures that are acceptable?

i.e. to have indoor temperatures more closely correspond to outdoor temperatures?

-> Altering expectations & behaviour

The problem of comfort (1)

- Is comfort physiological?

-> Fanger *'reductio ad absurdum'*

- Is comfort a socially negotiable concept?

  "A bourgeois mechanical logic of controlling and engineering the built environment" (Shove et al 2008)

  'free running' buildings and comfort as 'part of a self-regulating control system' Humphreys and Nicol (1973)

  "The presence of, and technical characteristics of, equipment and facilities influence individual perceptions and behaviour and contribute to the structuring of social norms about the practical problems and quality of life opportunities they seek to address." (Parkhurst & Parnaby 2008)

The problem of comfort (2)

- Different ways (not bldg services!) - physically& psychologically to achieve comfort.

- If expectations of ‘comfort’ are negotiable and can be adjusted

  -> we need to influence social and cultural inputs and expectations

Myths about comfort

- Productivity - only a perfect environment?
- Market value - what people / orgs want?
- Preference - people like ‘homogenous’ temperatures?

So what?

- Building inhabitants can take an active control of their comfort -> increased tolerance
- New ways of working: homogenous comfort necessary?
- Demand management: feedback, economics & strong narrative influence behaviour -> 50% domestic energy reduction at 39.4^{o}C (Strengers 2008)
- Comfort is more psychological than physiological

Some implications (1)

For construction & property sectors

- Provide a positive alternative story about comfort (Strengers 2008)
- Move toward an active inhabitant model
- Education: acceptable / unacceptable behaviours (cf water sector)
- Historical examples - California 1950s (Cooper 2008)
- Examine value / influence markets

Some implications (2)

For policymakers

- initiate the debate & admit the scale of the challenge
- examine the potential for creating / enlarging the non-standard indoor conditions: seasonal variations, different activities (sleeping, living, working…)
- adapt codes, standards & voluntary assessments to account for energy consumption AND comfort range
- alternatives for reducing vulnerability (Brown & Walker 2008)

"…meanings and definitions of comfort are not set in stone. Expectations may change in ways that exacerbate or reduce the problems of climate change *but the crucial point is they will change and that neither direction is a foregone conclusion*."

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