

# Housing 2030

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# UK Government's ambition

- To decrease carbon emissions by 80% on 1990 levels by 2050
- Domestic housing represents around 27% of total carbon dioxide emissions
- Average UK house releases 6.09tonnes/CO<sub>2</sub>/p.a
- Of which 73% comes from space and water heating.

- > is this national target capable of being achieved in the Cambridge sub-region?
- > gap between rhetoric and action on ground
- > what needs to be done so go in right direction?

# Housing 2030 Workshop

## 21 March 2011

### The speakers

- Doug Crawford Brown, Centre for Climate Change Mitigation
- Koen Steemers, Architecture Dept
- Kelvin MacDonald, Land Economy Dept
- Yolande Barnes, Savills

“we are world leading in setting sustainability and climate change targets.. But not in meeting those targets”

“85% of current dwellings will provide 70% of housing stock in 2050”

“decarbonising homes requires asking how we power them and live in them”

“increased comfort expectations - average household temperatures increased from 12c (1970) to 18c NOW”

“existing community/ neighbourhood action is at the heart of change”.....

# Questions asked of the housing specialists

- Top 3 constraints to achieving carbon reduction to existing housing
- How can Cambridge sub-region prepare for the challenge?
  - Productive dialogue/ engagement
  - Innovative practices and transferable solutions
  - Creativity v economic practicalities
  - Mobilised action /momentum for change

# Carbon-reduction to existing housing

- Depends on:
  - Nature of stock – its age, type and tenure
  - Degree to which energy efficiency of dwellings can be improved
  - Technology and practices required for decarbonisation brought into the market
  - Capacity and willingness of existing households to change habits & adopt measures
    - Socio-economic characteristics & Demographics
    - Cost & availability of finance
    - Regulation & incentives
    - Education & awareness

# Cambridge

## Cambridge Private Sector Housing Condition survey (2009)

- 53% owner occupation & private renting 25%
- 31% of stock is pre 1919 (*45% non insulated*)
- 19% of stock has 'poor degree of thermal comfort' by Government's Decent Homes Standard
- Thermal comfort failure rates increase with dwelling age / detached & large terraced housing/ private rented
- 45% vulnerable households in non-decent housing – fuel poverty
- Average 4.1 tonnes/CO<sub>2</sub>/annually per property

> To tackle thermal comfort £115m – average £3000 per dwellings

> “Strategy needs considerable engagement with residents” (CCC)

# Measures to reduce carbon emissions

What is most practical/cost effective/energy savings? (*Energy Saving Trust website*)

- Take regular meter readings
- Energy efficient light bulbs
- Turn off appliances when on standby
- Turn thermostat down (*by 1 degree = 10% heat bill cut*)
- Energy saving appliances recommended models A++ rated
- Loft insulation (50mm) (*save up to £150 p.a on fuel bill*)
- Cavity wall insulation (*save up to £115 p.a on fuel bill*)
- Solid wall insulation
- Under floor insulation
- Draught proofing (*windows, doors etc*)
- Double glazing
- Hot water tank jacket/ lagged hot water pipes
- Energy efficient combined heat and power (CHP) boiler
- Basic water retrofit measures
- PV solar panels & Feed-in-tariffs
- Smart meters
- Thermal image camera

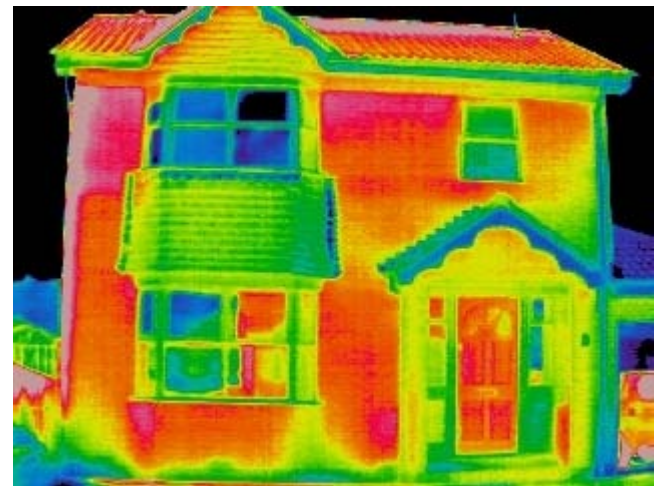
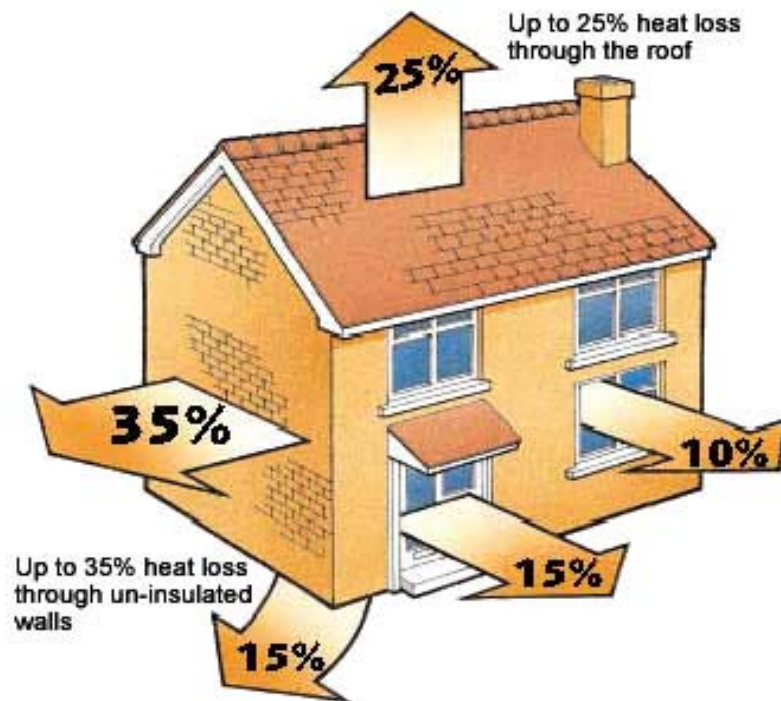


# Costs and savings of home improvements

(adapted from [www.energysavingtrust.org.uk](http://www.energysavingtrust.org.uk))

Measure	Loft insulation (50-270mm)	Cavity wall insulation	External wall insulation	Double glazing	Draft proofing	Gaps floor & skirting	water tank jacket	Lag pipes
Annual saving (£/yr)	Approx. £150	Approx. £115	Approx. £400	Approx. £135	Approx. £25	Approx. £20	Approx. £35	Approx. £10
Installed cost £	Approx. £250	Approx. £250	£10,500-14,500		Approx. £200	£12	Approx. £12	Approx. £10
Installed payback	Around 2 years	Around 2 years			Around 8 years	Around 1 year	>6 months	> 1 year
Annual CO2 saving	Around 800kg	around 560kg	Around 2 tonnes	Around 680kg	Around 130kg	Around 110kg	Around 170kg	Around 60kg





# Constraints in Supply chain

- Complex supply chain to bring technologies and practices into market
- need cooperation among designers & suppliers of technology/ merchants/ manufacturers/ architects/ engineers/ approved installers
- Technologies there – need to focus on mass retrofit implementation
- Banish conservatism/vested interests
- roll out innovative solutions - replicable and economically viable
- Industry knowledge needs to be shared and research not wasted - a `retrofit road map'
- Contractors accurately price work and provide a warranty provision i.e. quality control



# Financial constraints

- How to get people to pay for retrofit – how make viable?
  - Reduce risk aversion and uncertainty / unfamiliarity
  - Installation and maintenance costs
  - Money savings on energy bills and when recoup outlay
  - Reduce pay back period on investment
- Financial mechanisms to allow cost recovery of low carbon investments e.g. low interest loans
- PAYS – long pay back period through savings made on energy bills
- Third party e.g. banks/retailers/LA - share risk premium
- Need one-stop-shop for funding and technical advice on upgrading
  - Energy Efficiency Advice Centres
  - Trustworthy/ unbiased advice to assess options



# Consumer buy-in

- Education increases yet carbon footprint of most well informed generation still increases
- Lack of public awareness and commitment to sustainable living – e.g. insulation not on decision making radar as investment opportunity
- Lack of understanding what an individual can achieve e.g savings on electricity bills/return on investment
- Too many voices of reason causes lethargy and inertia – avoidance
- if scientific proof too complex loses interest / mistrust
- Ability and willingness varies by household type
- Rebound effect – spend savings on increased consumption/domestic comforts
- Rented accommodation – renters save on bills but capital outlay by owner occupier – disincentive effect



# Retrofitting Cambridge sub-region

- Cambridge sub region well suited to local initiatives
  - Act as a exemplar/ leader - `Cambridge brand'
    - Already culture of walk rather than drive/ recycle/switch off appliances
    - Draw on entrepreneurial community: town/gown /businesses/funders – Cambridge Bank
    - Existing networks share common ground & make smart choices/ take responsibility
    - Aids policy maker's ability to target endeavours
    - Access City Council's Climate Change Fund
- > social contagion: shapes behaviour

# The initiatives

- Need a simple effective awareness campaign
- Focus on a few ideas and follow through – evidence based strategy (e.g prioritise insulation)
- Thermal image surveys of homes to monitor heat escape/ smart meters
- Demonstrate possibilities – lead using examples of upgrades (e.g. Cambridge Carbon Footprint)
- Retrofit existing house cheaper alternative than moving – should contemplate
- Use communities/neighbourhoods scale to deliver retrofit
  - benefit from economies of scale – local retrofit zones
  - innovation at neighbourhood level intensifies action
    - “I will if you will” – peer group pressure/ word of mouth – Pledgebank.com
    - unfreezing bad habits more effective in groups
    - how street doing compared to others and given constant feedback/validation

## Overcome barriers to action

- Street advisors/ share information
- skip weekend in street to aid loft insulation
- scrappage schemes e.g old appliances



Target Schools – i.e. educate next generation – increase knowledge

# The way ahead

- creates mass customisation/ force for good
- `Visualisable' change – paint town green
- Need a belief that people can make a difference – scale of any domestic change makes a difference
- People need to link behaviour to bigger picture problem
- Each individual responsible and change old behavioural patterns
- What can we all do about it? Visibly pull in one direction
- Pro-environmental behaviour takes place in groups
- Cambridge sub region network-based society creates momentum for change

