

Rethinking Housing Refurbishment

Kate Symons

Associate Director of Refurbishment and Regeneration - BRE

APSE – Scottish Building and Housing Seminar - 2009

BRE

- Our mission:
to build a better world
- Providers of research, consultancy and testing services
- Founded in 1919
- Sets National and International Standards for construction
- BREEAM and Eco homes and codes
- Home of the Innovation Park

BRE Scotland

BRE Scotland core activities:

- BRE Scotland Innovation Park
- Thermal modelling / performance
- Construction consultancy & research
- EPC assessor training
- BREEAM and Eco-homes
- Sustainable developments
- Scottish Construction Centre

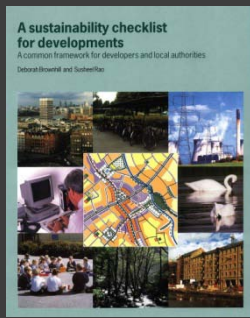


Sustainable Scotland Team delivers BRE sustainability tools:

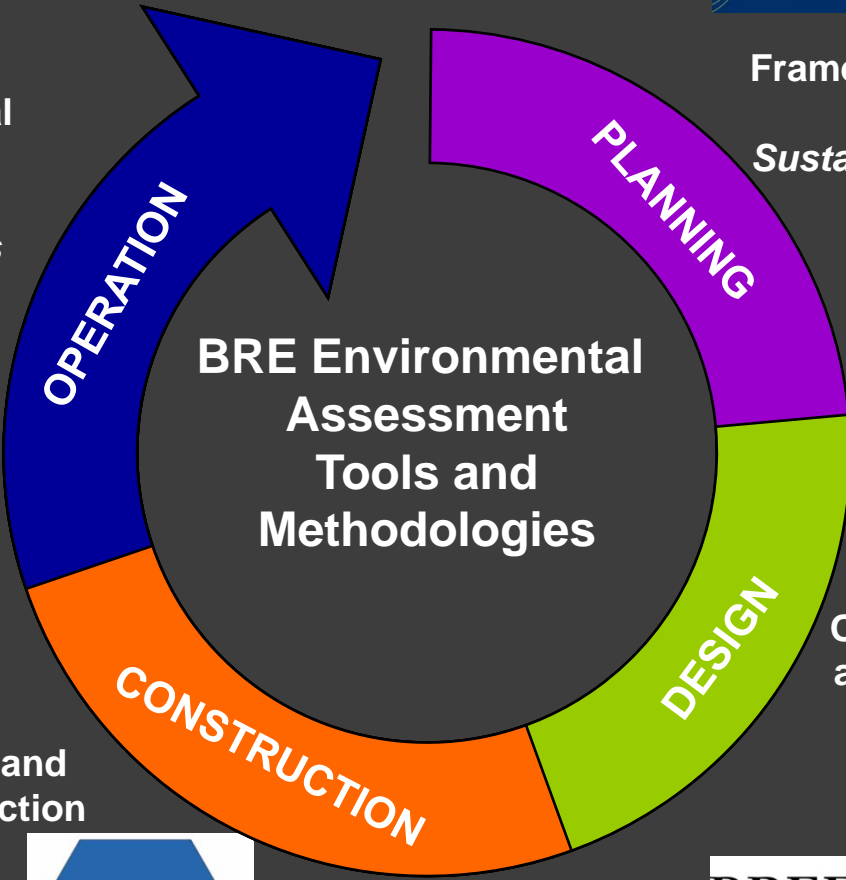
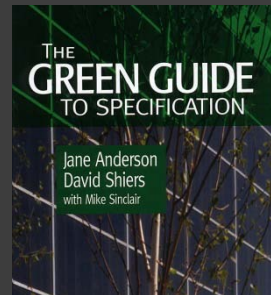


Design Charrette

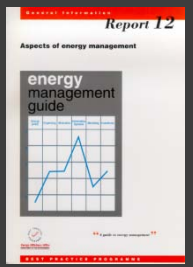
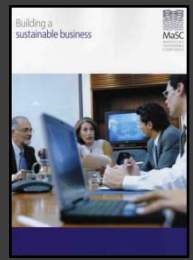
Framework for Sustainable Development
Sustainability Checklist for Developments



Optimising Building Design and Materials Specification
BREEAM / EcoHomes / ENVEST / Green Guide



Minimising Operational Impacts
MaSC / Energy Management Matrices



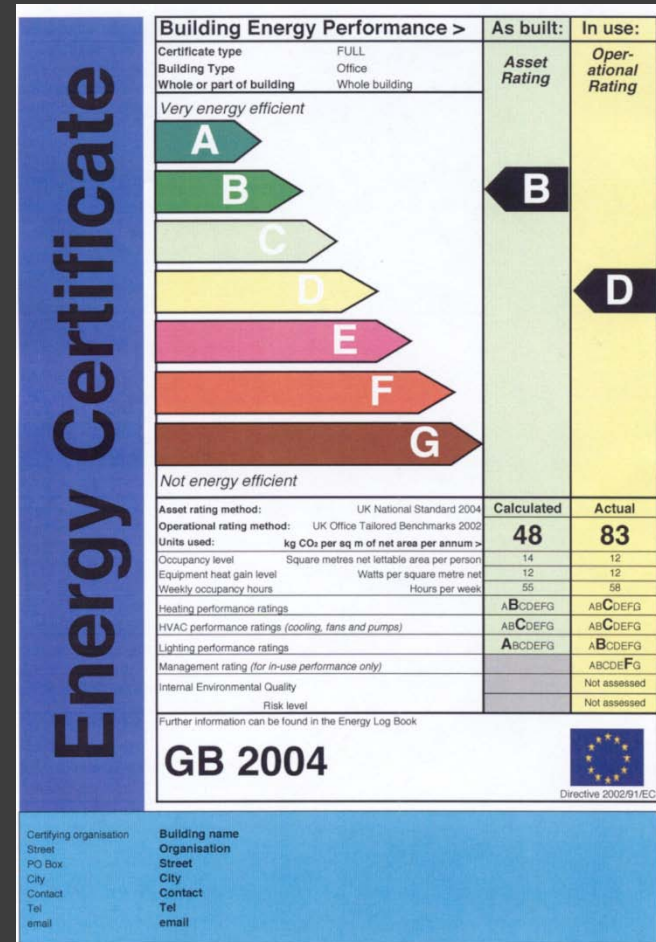
Waste Minimisation and Recycling in Construction
SMARTWaste



BRE Scotland Activities include Training and more....

- Approved Certifiers of Design
- SAP & SBEM Training
- BREEAM
- Energy Performance Certificates (EPC) in Scotland
 - BRE is approved, by the Building Standards Division of the Scottish Government, to operate an Energy Performance Certification Scheme (EPC) for Domestic and Non Domestic Buildings in Scotland.
 - EPCs are required for all new buildings.

[EPC Scotland Domestic application](#) or
[EPC Scotland Non-Domestic application](#)



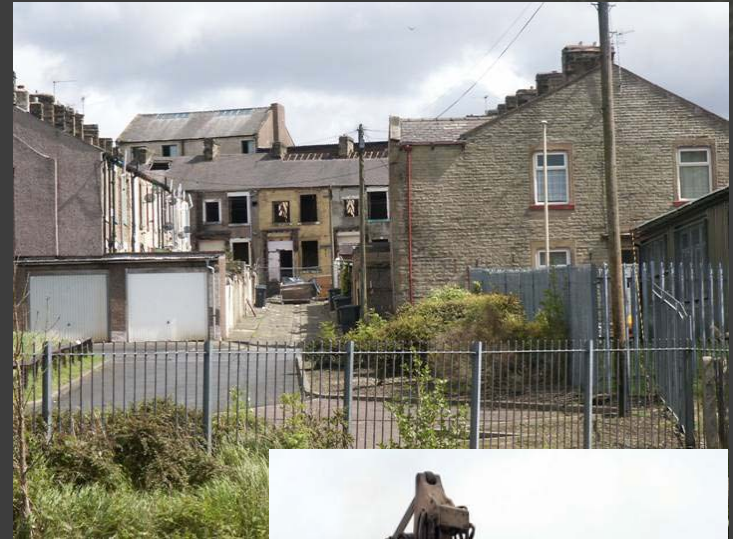
Today's Presentation



- Why Refurbish?
- The Rethinking Housing Refurbishment Programme
- Challenges
- BRE Flagship exemplar project, the Stable Block
- Including:
 - Sourcing sympathetic materials for refurbishment taking account of the norm and Heritage construction
 - Measuring outcomes for increased refurbishment performance
 - How BRE will calculate the cost/benefit for refurbishment

Why refurbish?

- Climate Change Bill sets legally binding target for reducing UK CO2 emissions - at least 80% by 2050
- Address fuel poverty and ensure decent and affordable homes for all
- Sustainable refurbishment is key
- The alternative – demolish/rebuild – wasteful and leaves greater emissions
- All buildings generate nearly half of our emissions



Rethinking Housing Refurbishment



- BRE programme to make the case for sustainable refurbishment
- Refurbishment no longer “Cinderella”
- Provide guidance for the construction industry
- Training and education (paramount to success)

The rethinkinghousing refurbishment programme

Overarching programme of 10 National Exemplars measured on a “before and after” basis – to prove the case for refurbishment and to inform refurbishment guidance.

Locations:-

- Stoke on Trent
- East Lancashire
- Sheffield
- Hull
- Leeds
- Plus other partners across the UK, including some London boroughs
- Seeking a project in Scotland

Our principles: embracing sustainability



- Reduce waste and emissions
- Place value upon the embodied energy of building elements
- Take into account costs of using finite materials
- Retain existing building fabrics where possible
- Waste audits to ensure maximum recycling potential

Challenges we face

- Creating drivers for refurbishment
- Wide range of housing types
- No agreed standards – yet!
- Sourcing sympathetic materials



Headline challenges – time for a step change

- Housing energy use is responsible for 27% of UK CO2 emissions
- Existing buildings are the key to improving this:-
 - UK housing stock amounts to 26 million dwellings
 - Annual new-build rate <1% of existing stock
 - Two-thirds of current housing stock will still be standing in 2050

Headline challenge –Hard to Treat Homes (HTT)

- 43% of English stock (9.2 million dwellings) is HTT
- Responsible for 50% of all CO₂emissions
- 70% of HTT homes (30% all dwellings) have solid walls

Headline Challenge – Non decent homes

- 8.1 million (37%) of English Homes are non-decent
- 59% (4.8 million) fail HHSRS criterion with excess cold being most common Category 1 hazard
- Just over half (4.1 million) fail to provide adequate thermal comfort

Insulation: What are LAs and RSLs doing?

- Decent Homes standard being exceeded:
 - 90% plan to insulate both lofts and cavity walls
 - By 2010 85% of lofts should have insulation $\geq 200\text{mm}$
- But, situation with walls more complicated:
 - Standard only refers to cavity walls although most landlords exploring options to insulate other constructions
 - Some cavities not easily insulated, e.g. too narrow, high rise blocks etc.
 - External wall insulation (EWI) sometimes used for solid walls etc., but costs high and wide variations between landlords
 - EWI can re-vamp fabric and help to transform run-down areas, but can be problems particularly in conservation areas

	Walls insulated now	Walls insulated by 2010
Houses with cavities	77%	91%
Houses with solid walls	27%	38%
Non-traditional houses	48%	64%
High rise flats	38%	51%

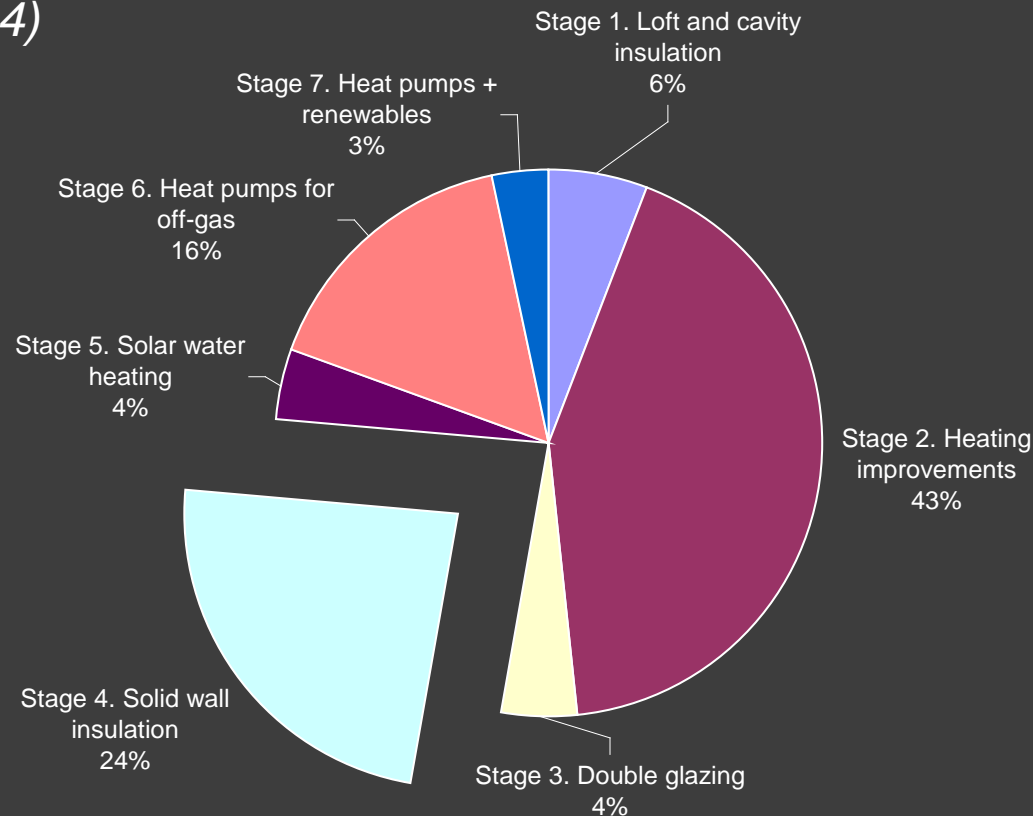
Source: *Implementing Decent Homes in the Social Sector*, February 2007 (CLG website)

Improving Hard to Treat Homes

- Improvement potential assessed in 7 stages split into three main groups:

- *Mainstream measures (1 & 2)*
- *Non-Mainstream measures (3 & 4)*
- *LZC technologies (5, 6 & 7)*

- CO₂ savings (34 Mtonnes) split:



Solid wall insulation: potential

- Potential for solid wall insulation (external and internal) is considerable for HTT homes:
 - *Decent Homes (plus SHQS and WHQS)*
 - *CERT – many social landlords use CERT/EEC to supplement Decent Homes activity*
 - *Warm Front (plus Scottish, Welsh and Northern Irish equivalents)*
 - *Housing Market Renewal etc.*



Solid wall insulation: current activity

- BUT, current activity is relatively low, about 17,500 retrofit installations in 2007
- These are industry estimates - there is no robust data
- Industry concerns that although solid wall insulation is eligible under CERT it will only lead to 12,000 to 14,000 installations per year



Source: UK Domestic Solid Wall Insulation: Sector Profile, May 2008 (EST/EEPfH)

Solid wall insulation: barriers to implementation

- Barriers identified:
 - *Fabric changes for EWI may be unacceptable to householders and can be issues of planning in conservation areas, although EWI can enhance dwellings and transform run-down areas*
 - *Installation of both internal and external insulation can be disruptive to householders*
 - *Internal wall insulation can lead to loss of floor space*
 - *Solid wall insulation can be expensive*
 - *Lack of consistency in estimating costs and payback periods*
- Key conclusion is that installation rates are unlikely to increase without promotion, incentive schemes and innovation.
- This is (in part) what the BRE's output agenda comprises!

Refurbishment is also about sustainable communities

- Refurbishment keeps existing communities intact
- Conserves heritage
- Provides options for telecare and assistive technology
- And adaptations for climate change



The Stable Block Project

BRE's flagship refurbishment project



After refurbishment

A sustainable future



Project Team

- BRE
- HMR Pathfinders
- EEDA
- University of Hertfordshire
- Prince's Foundation
- PRP Architects
- Wates Living Space
- Scott Wilson
- E C Harris
- RSK – Environmental
- British Gas
- The Wolseley Group

We are actively seeking more.....

bre



Building Form

- Extension designed to respect massing of Arts and Crafts extension



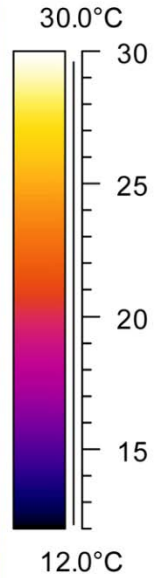
Converted Building



Full testing programme

- Thermal Imaging
- Acoustic testing
- Air tightness testing
- Indoor air quality
- Monitoring of the interior of the building fabric
- Pre and post-occupancy evaluation

Thermal Imaging Survey



Expected Outcomes (1)

- Monitoring to include performance of:-
 - insulation systems
 - drying out of the walls
 - building air tightness and improvements
 - thermal performance of the building fabric

To inform:-

- Guide to Best Practice refurbishment of Victorian solid wall houses
- Potential code for sustainable refurbishment – plus climate change
- Costs per square metre to inform best practice
- And more.....new products

Expected outcomes (2)

- Demonstrate innovation in refurbishment – materials and methods (thin wall insulation - external breathable membranes - resins)
- Demonstrate renewable technologies and skills (new NVQs)
- Show intelligent technologies sympathetic to refurbishment
- Demonstrate co-incidental working practices
- Provide ongoing training and education for crafts and skills
- Ensure that lessons learnt are applied to future refurbishment projects.

Things are happening

- Setting up exemplar projects across UK
- Stable Block project
- Lead the way for others to follow
- Leave legacy
- Starting work with the testing projects and affiliated projects – now!



Existing Guidance

- Energy Efficiency Best Practice for Housing has published technical guides and case study documents on:
 - *Refurbishing HTT homes*
 - *External and internal wall insulation*
 - *Other related topics*
- Can be found on EST website at:
 - <http://www.energysavingtrust.org.uk/housingbuildings/publications/>



Thank you for listening.....

Rethinking Housing Refurbishment – making the step change.....

Kate Symons

Associate Director of Refurbishment and Regeneration, BRE

