BRE: Green Deal Challenges

Oliver Novakovic, Chair

Building Futures

29th June 2012

Part of the BRE Trust

What is it?

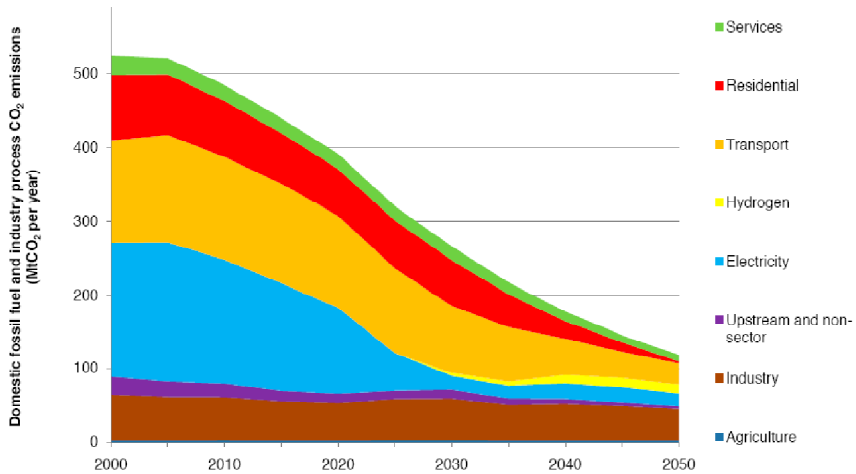

Green Deal
actonenergy
Golden Rule saving
Annual energy cost
Previous energy cost
Previous energy bill
Green Deal loan repayment
New energy bill
New energy cost
Before
After
www.actonenergy.org.uk

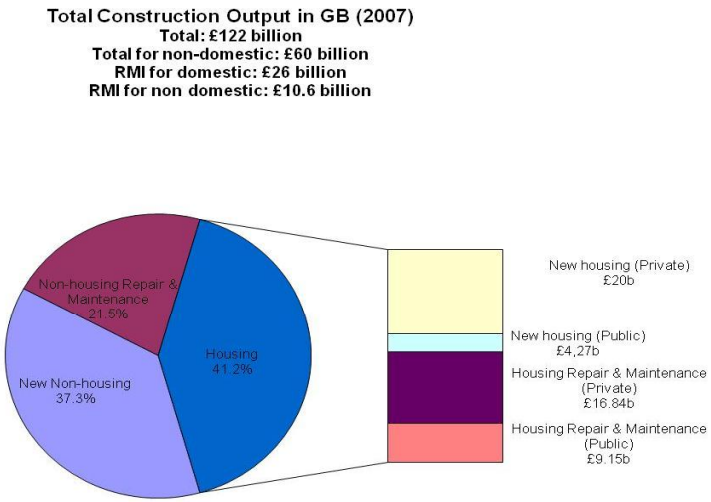
Macro issue we need to consider?

Obvious Challenges

- The low-carbon refurbishment of over 20 million existing homes by 2050 in the UK may cost £500 billion at the rate of £250 million each week

- 21 million homes & 1.8 million non-domestic buildings





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Gasoline
Self Serve
REGULAR UNLEADED
ARM
9/10
PLUS UNLEADED
LEG
9/10
SUPER UNLEADED
Both
9/10

bre


by far the most terrifying film
you will ever see.
aninconvenienttruth
A GLOBAL WARNING
now playing in select theaters


AN INCONVENIENT TRUTH
A REASSURING LIE
THE CHRISTIAN SCIENCE MONITOR
Bennett

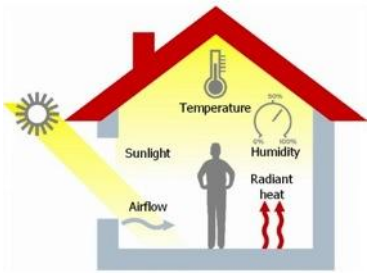
Micro issues we need to consider?

Reduction Factors:

– Installation/Surveyor

– Product

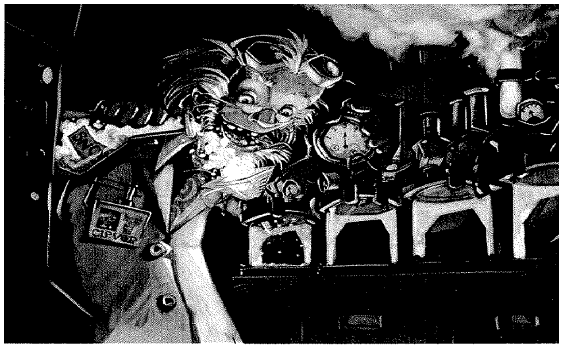
40-67%



– Behaviour (thermal comfort): 14-17%

"Review of differences between measured and theoretical energy savings for insulation measures" C Sanders & M Phillipson, Glasgow Caledonian University, December 20

In use factor



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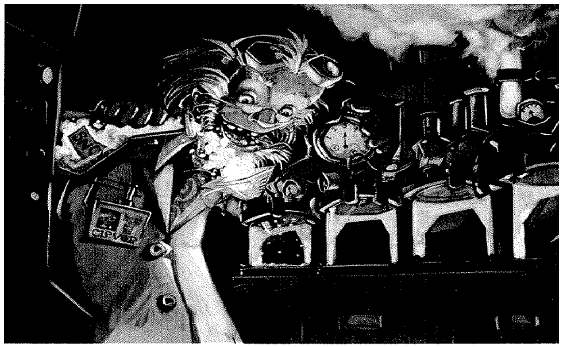
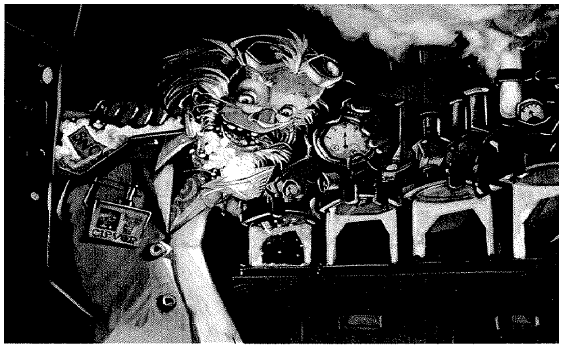


40% Difference

In use factor



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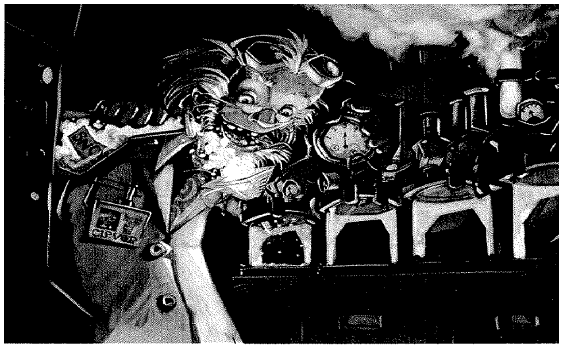
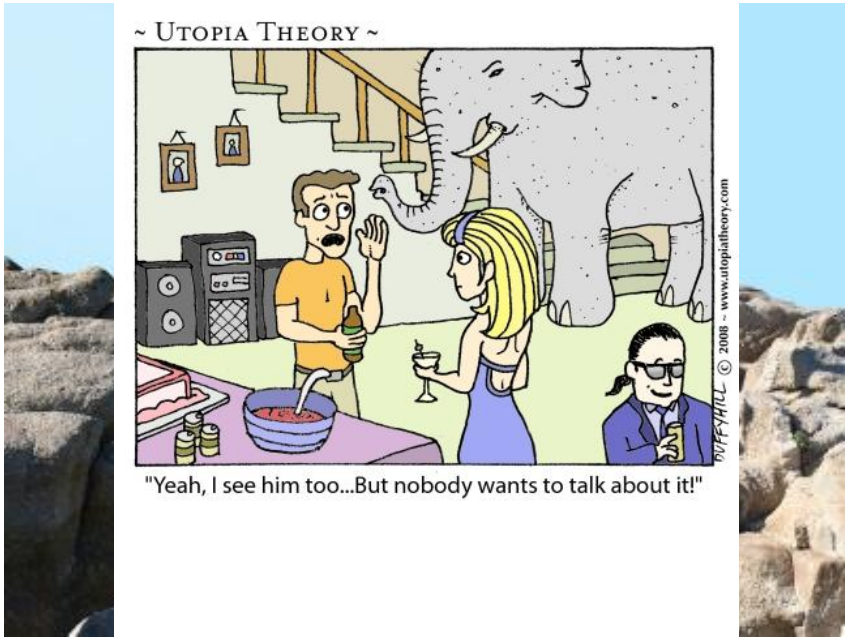
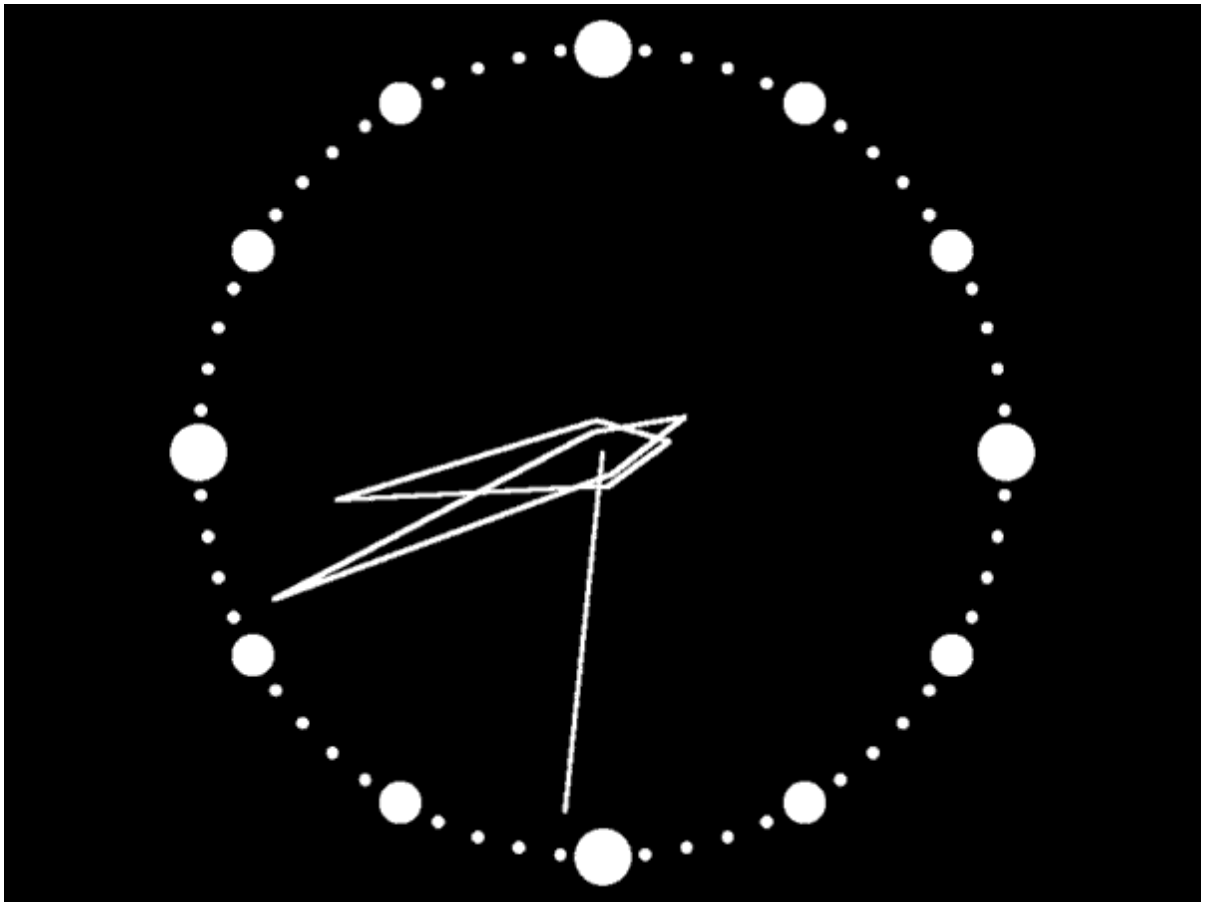





Heat Kind

Installation issues

Time to 2050: 21 million minutes



Is it possible?

Great Kanto Highway, Japan

17 March 2011

23 March 2011

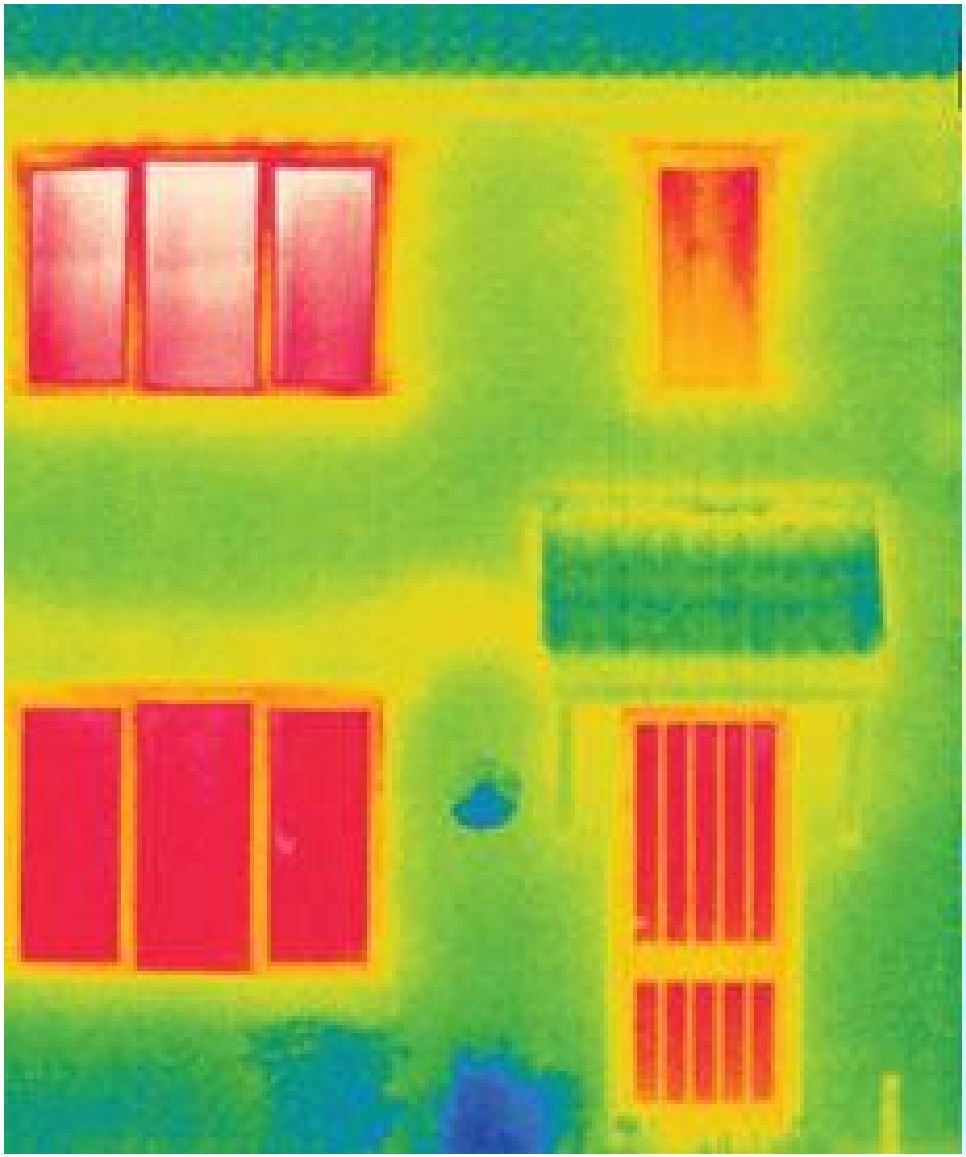
Consumer Needs

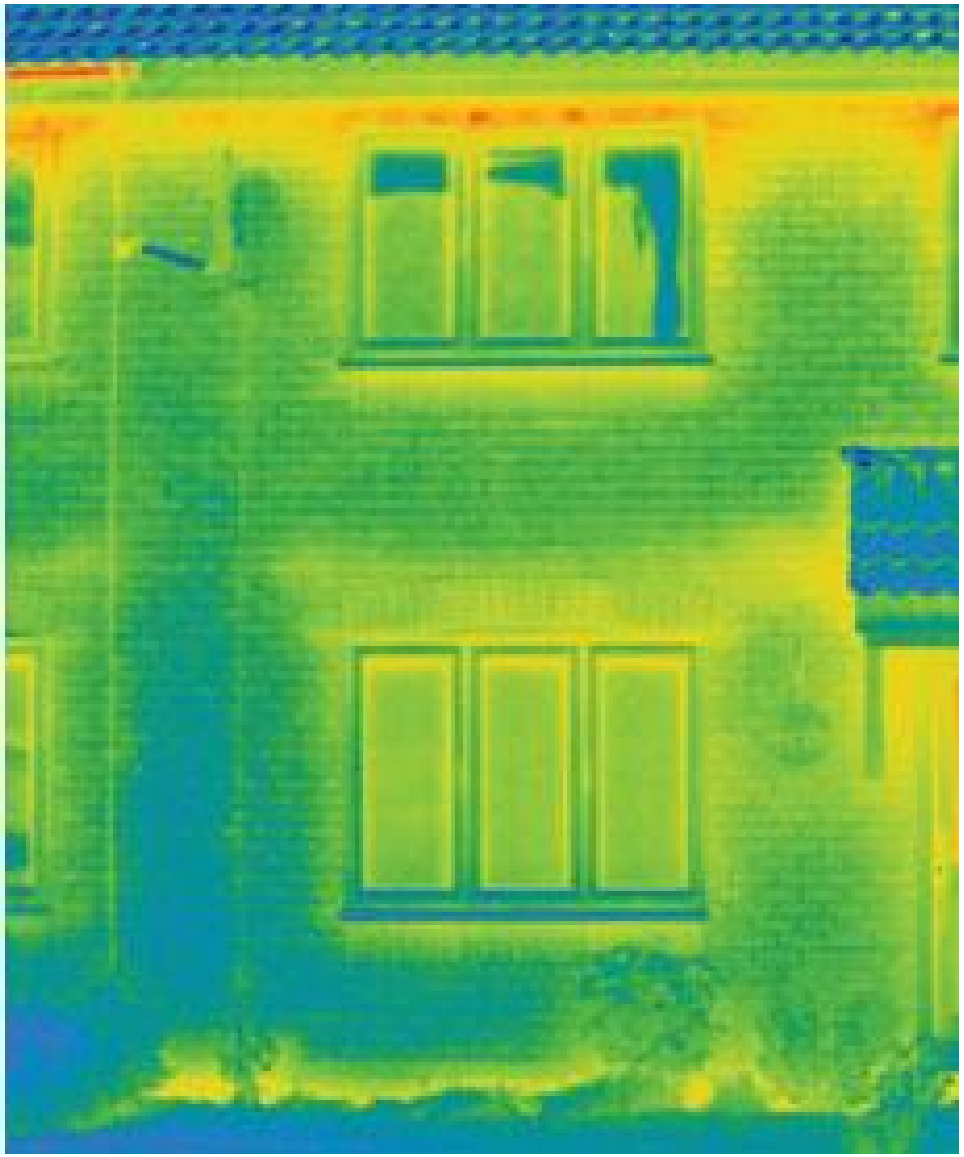
Lucy Darch, Uswitch

Part of the BRE Trust


http://www.uswitch
uSwitch.com
tricity


$495



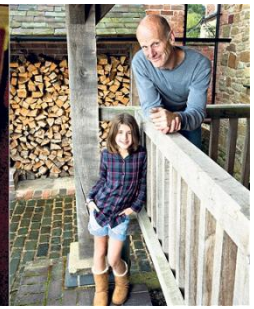


What is the offering? Home improvements












How is it paid for? A new kind of loan

- Loan to the property, not the individual
- Bill reductions > monthly loan repayments
- Reducing heating bill (gas, oil, lpg, electricity)
- Repaid through the electricity bills (everyone has one of those)

Green Deal : What about low income households?

- Eco will replace CERT/CESP
- £1.3bn per year
- 230,000 low income homes
- + hard to treat homes

Green Deal : Who are the providers?

And some of you?

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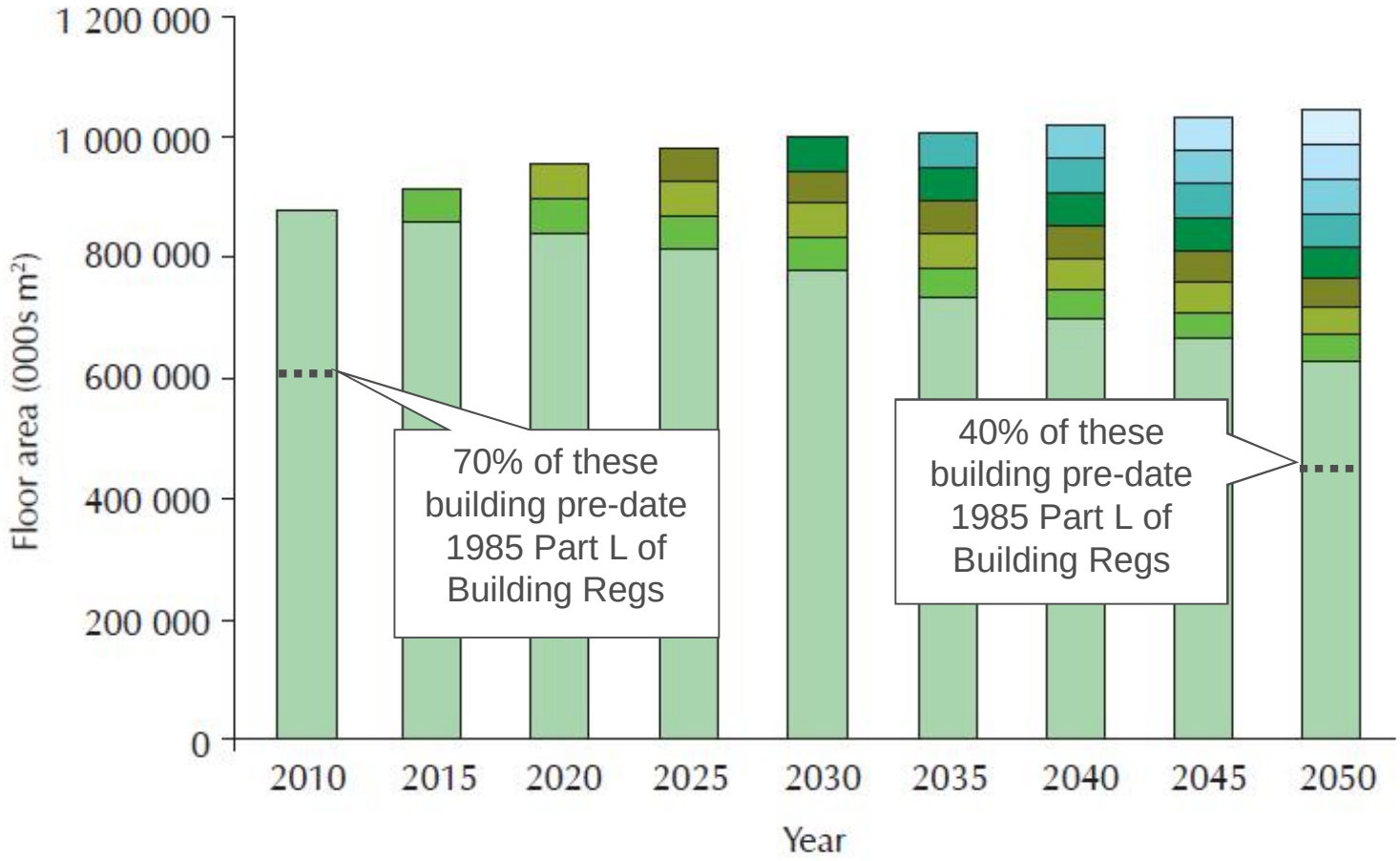
Will the Green Deal deliver for the non-domestic sector?

Matt Dickinson
Building Futures Group

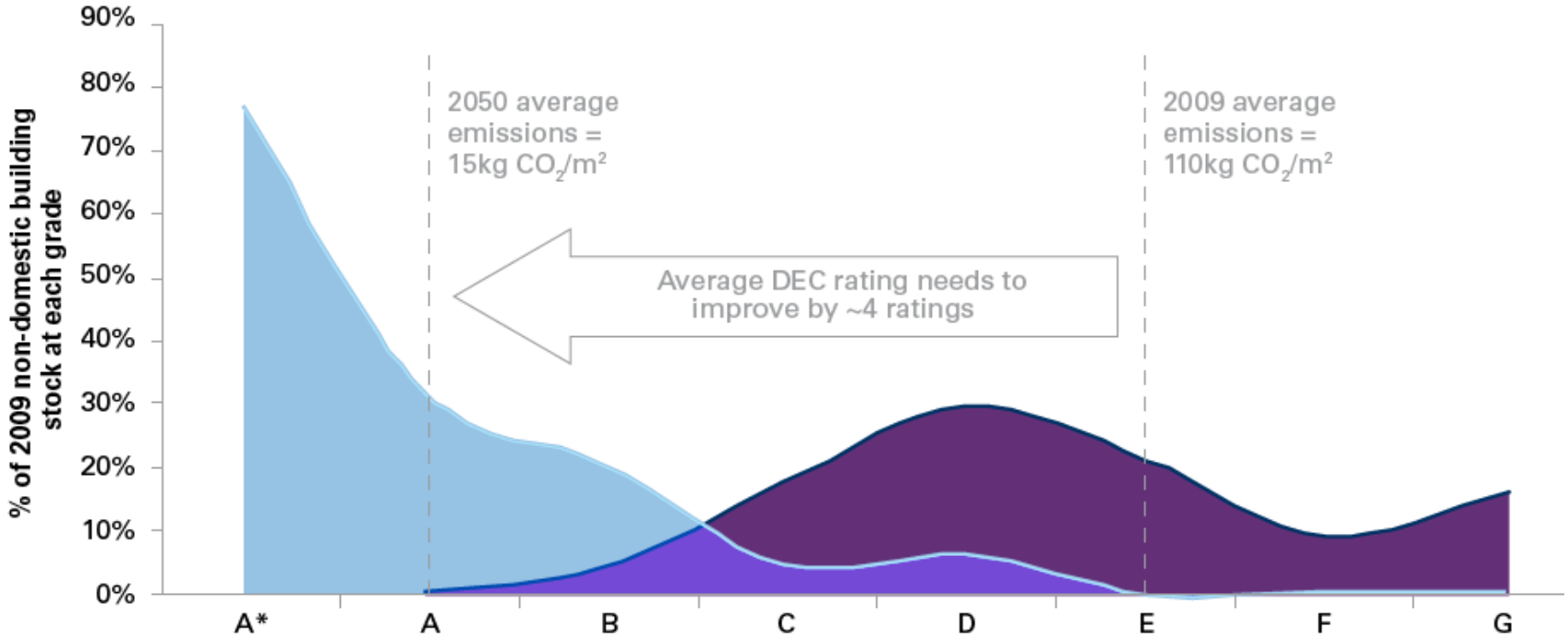
07772228725
dickinsonm@bre.co.uk

Age profile for projected UK non-domestic buildings



BRE Energy Efficiency in New and Existing Buildings, 2010

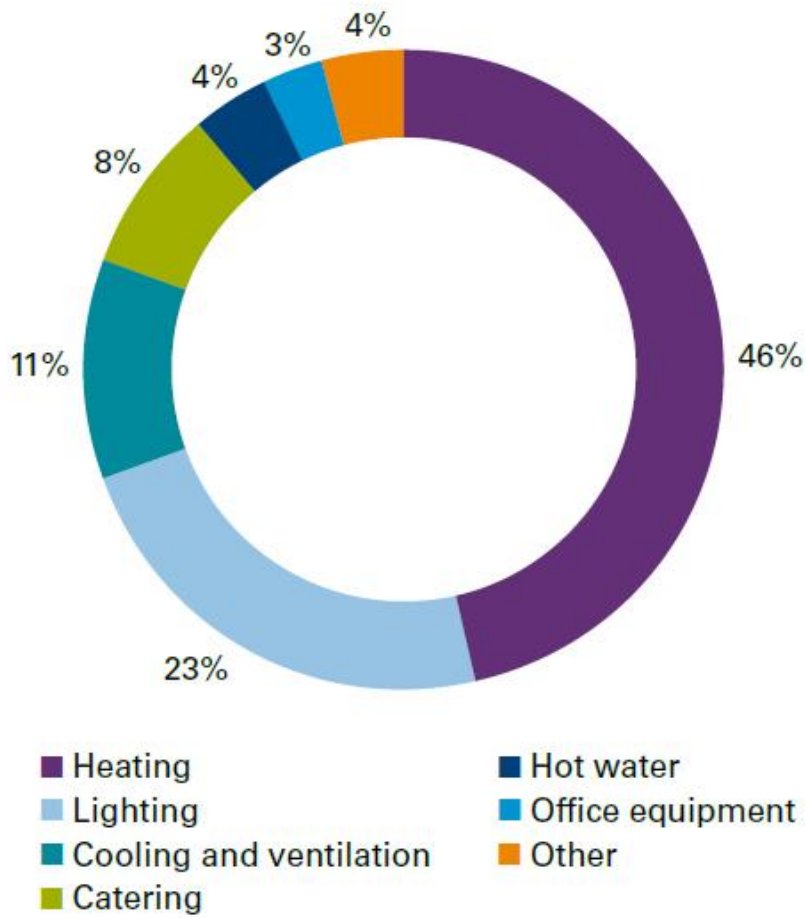
Shift in DEC distribution from 2009-2050



	A*	A	B	C	D	E	F	G
2009 carbon distribution	0%	0.1%	2%	10%	24%	22%	12%	29%
2050 carbon distribution	0%	19%	36%	14%	26%	2%	1%	1%

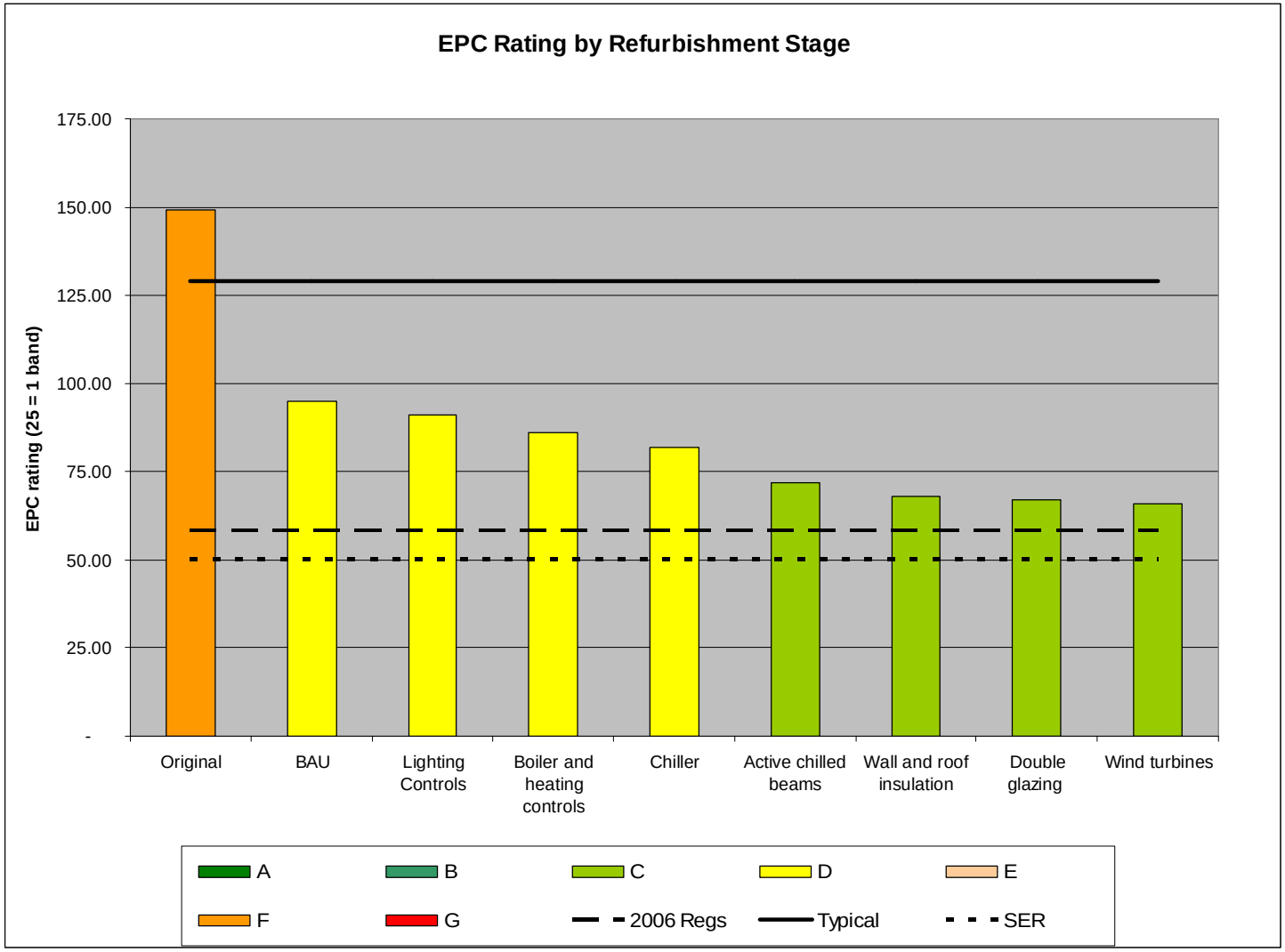
Source: Department for Communities and Local Government data for public sector buildings (August 2009); Carbon Trust analysis

Carbon emissions by end use in the UK's non-domestic buildings, %



100% = 106MtCO$_2$
Source: BRE (2005); Carbon Trust analysis

Low carbon refurbishment of an office



Client drivers for Green Deal for non-domestic sector

- Significantly reduce energy cost savings
- Improved comfort and productivity
- Carbon reduction and carbon taxes

- Replace ageing assets
- Reduce maintenance liability

- Lack of capital or prioritised for core business investment
- Limited internal resource

- Risk transfer

Eligible Green Deal measures in the non-domestic sector

Programmable Thermostats
Basic Lighting Timer
Light Detectors
Presence detector
Stairwell timer
Heating - More efficient air conditioning
4 Pole Motor - EFF1 replace 4 Pole
Variable Speed Drives medium
Windows - Double Glazing

Insulation - Roof (flat & pitched) and Wall
Programmable Thermostats
Lights - 16 mm Fluorescent Tubes Replace 26mm
Lights - Compact Fluorescent Lamps
Lights - HF Ballast
Lights - IRC Tungsten-Halogen – Spots
Lights - LEDs Replace 26mm Fluorescent Tubes
Lights - Metal Halide Floods
Heating - TRVs Fully Installed

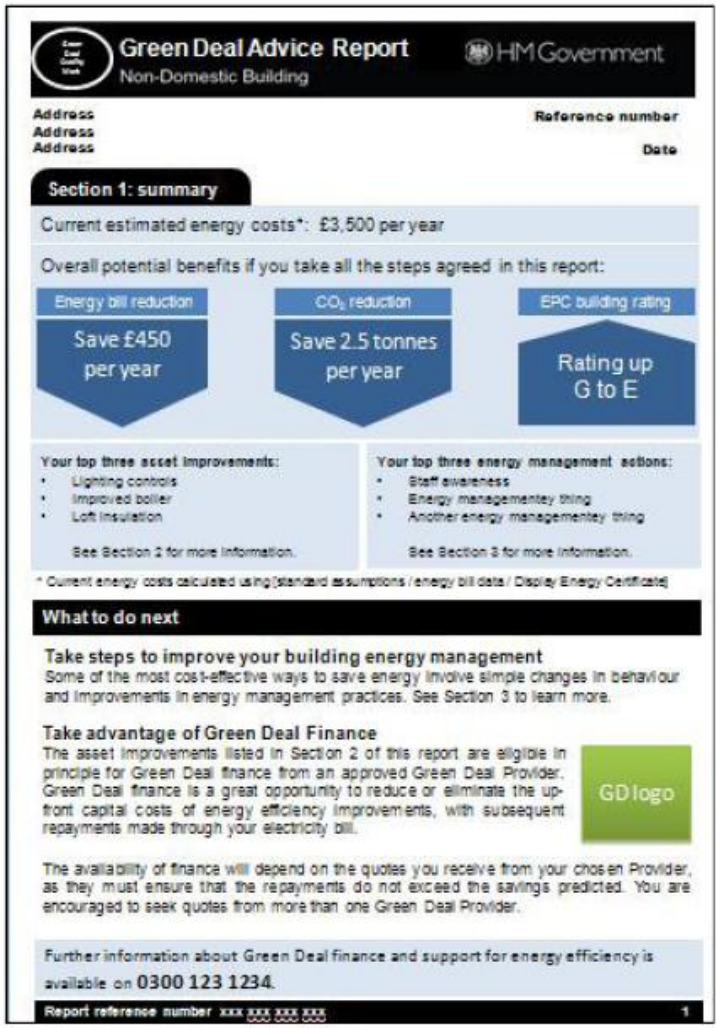
Many of these measures can payback within 5 years

Green Deal process

Green Deal advisory report

- Energy savings
- CO_2 reduction
- Asset improvements
- Steps to improve energy management
- Recommendations

- Tailored to a particular building
- Adjusted by using actual consumption
- Model more than one measure



Green Deal Advice Report
Non-Domestic Building
HM Government

Address
Address
Address

Reference number
Date

Section 1: summary

Current estimated energy costs*: £3,500 per year

Overall potential benefits if you take all the steps agreed in this report:

Energy bill reduction	CO_2 reduction	EPC building rating
Save £450 per year	Save 2.5 tonnes per year	Rating up G to E

Your top three asset improvements:
- Lighting controls
- Improved boiler
- Loft insulation

See Section 2 for more information.

Your top three energy management actions:
- Staff awareness
- Energy managementey thing
- Another energy managementey thing

See Section 3 for more information.

* Current energy costs calculated using [standard assumptions / energy bill data / Display Energy Certificate]

What to do next

Take steps to improve your building energy management
Some of the most cost-effective ways to save energy involve simple changes in behaviour and improvements in energy management practices. See Section 3 to learn more.

Take advantage of Green Deal Finance
The asset improvements listed in Section 2 of this report are eligible in principle for Green Deal finance from an approved Green Deal Provider. Green Deal finance is a great opportunity to reduce or eliminate the up-front capital costs of energy efficiency improvements, with subsequent repayments made through your electricity bill.

GD logo

The availability of finance will depend on the quotes you receive from your chosen Provider, as they must ensure that the repayments do not exceed the savings predicted. You are encouraged to seek quotes from more than one Green Deal Provider.

Further information about Green Deal finance and support for energy efficiency is available on 0300 123 1234.

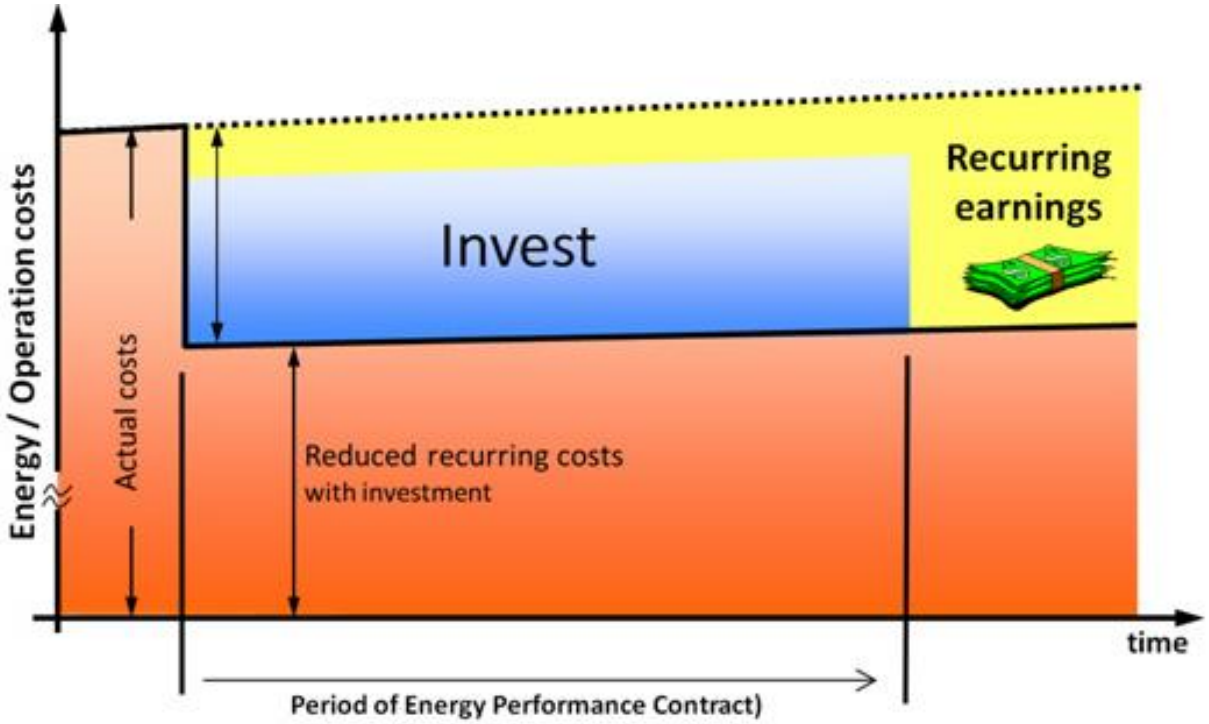
Report reference number xxx xxx xxx xxx 1

What is the competition for Green Deal in non-domestic?

- Own Investment?
- Energy Performance Contracting (or ESCOs)?
- RE:FIT Programme?

Energy Performance Contracting process

- Investment grade audit
- Business case & verification
- Install & Maintain
- Monitoring & verification
- Finance
- Fuel supply



Comparing the options

	Green Deal	EPC/ESCO	Own finance
Measures	45 defined measures	Any measures	Any measures
Guaranteed Savings?	No guarantee but must meet golden rule	Guaranteed or shared savings + verification	None required
Accreditation?	Yes – oversight body and Code of Practice	No formal accreditation (RE:FIT prog)	None required
Savings calculation?	Advisor survey and SBEM	No standard	No standard
Finance?	Private sector	Private sector + own finance	Own funds or debt
Repayments?	Fixed fee paid via electricity bill	Fixed monthly fee	Need to satisfy business case

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RE:FIT

BUILDING ENERGY EFFICIENCY FOR TOMORROW

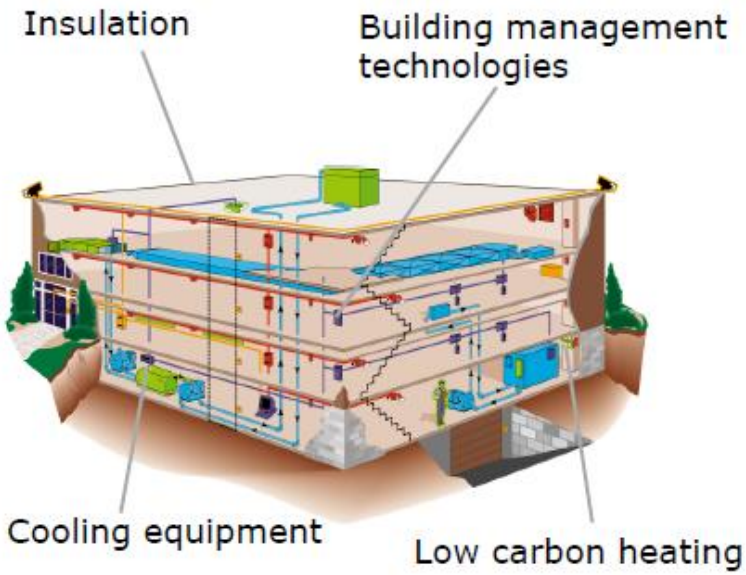
BE PART OF IT

What is the RE:FIT building energy efficiency programme?

- **Energy Performance Contracting approach:** The public sector building owner identifies a portfolio of buildings they would like to retrofit, sets a target percentage energy savings and a payback period

- **An Energy service companies** (ESCOs) carry out the works and guarantee the resulting energy savings

- **This guarantees the payback of the initial investment** with the delivery risk transferred to the ESCO.
- Hence this is a cost neutral means to reduce energy bills and carbon footprint of buildings



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RE:FIT
BUILDING ENERGY EFFICIENCY FOR TOMORROW

BE PART OF IT

Energy Conservations Measures

- CHP
- VSDs on Pumps and Fans
- PC control
- Voltage optimisation
- Lighting & controls
- BMS Controls
- Heat recovery
- Solar thermal
- Photovoltaic panels
- Cavity wall insulation
- Loft insulation
- Insulation to pipework
- Secondary glazing
- Draught proofing
- Radiator reflector panels

1E Nightwatchman software for PC auto shutdown

Will the Green Deal deliver for the non-domestic sector?

- ESCOs want large contracts – typically multi £M contracts
- Low awareness and trust of ESCO models
- No standard procurement rules for ESCOs (RE:FIT programme is exception)

- Corporates could see the value in a government accredited Green Deal approach
- Off balance sheet is attractive for many organisations
- Shorter ROI for energy efficiency investments

- If the occupants of the property change the obligation to pay passes to new occupier
- Experience and resource required means high transaction costs especially for guaranteed savings

- Cost of finance?

Sharing the Learning
29 June 2012

Chris Ward-Brown
Chairman

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energy saving trust

National Refurbishment Centre

Drivers


Climate Change Mitigation
People
Climate Change Adaptation
Today's Buildings
Business Processes
Legislation
National Energy Infrastructure
Economics price & tax

National Refurbishment Centre

- Mission:

  To support the practical delivery of green refurbishment and retrofit in the UK, based on evidence from a nationwide demonstration network of exemplar buildings.

- Aim:

  To foster a more joined-up approach to finding the practical measures needed to refurbish buildings in volume.

The retrofit challenge

- UK homes are some of the oldest and least efficient in Europe
- All Buildings account for 45% UK CO2 emissions
- Housing energy use is responsible for 27% of UK CO2 emissions
- 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
- High levels of heat loss through roof, walls, floors, windows and doors
- Infiltration of cold air via holes and gaps
- 1/3 of dwellings in England provide insufficient thermal comfort to occupants
- Significant environmental impact of CO_2 from inefficient building stock

The retrofit Opportunity

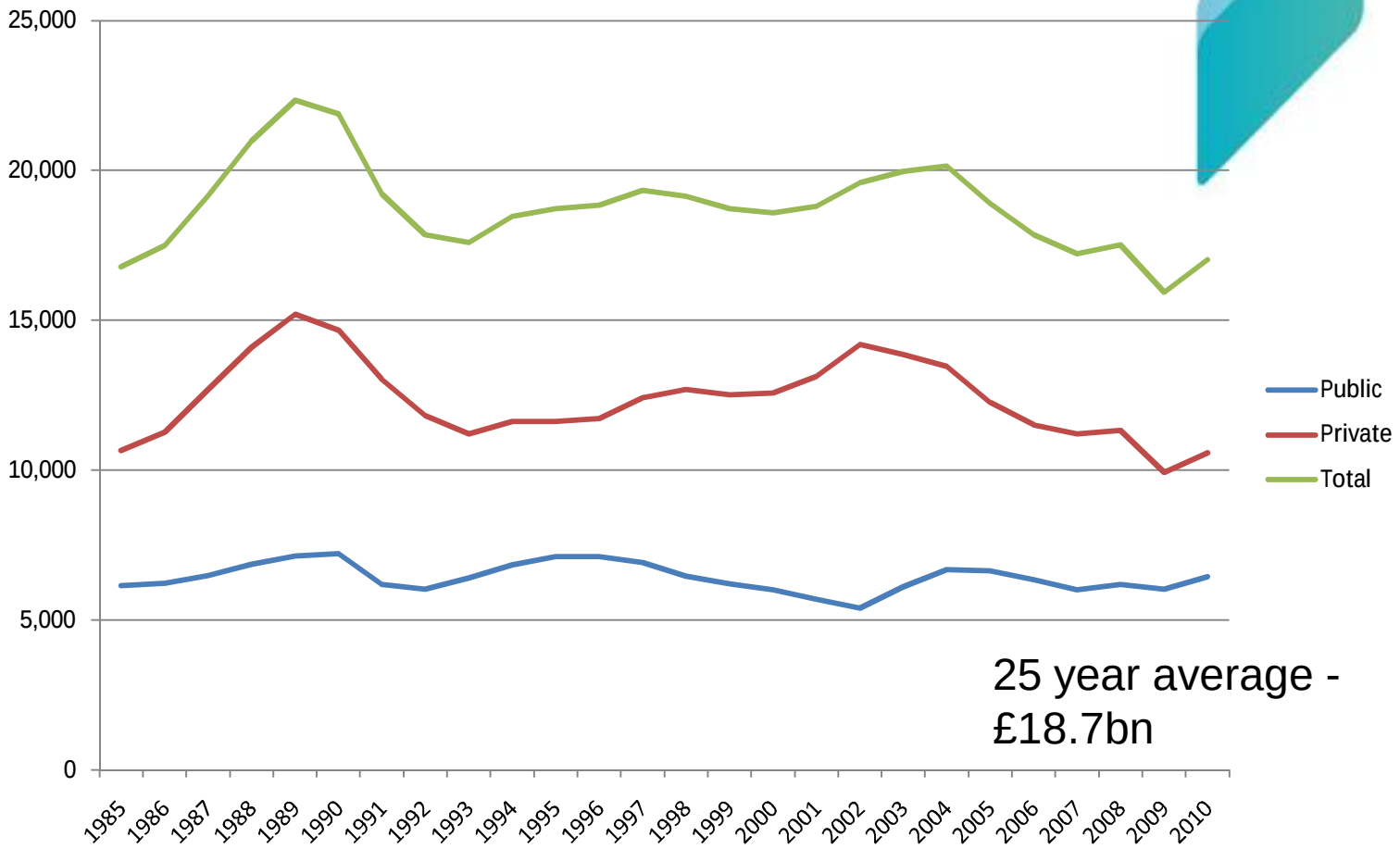
- The retrofit programme could be worth £280 billion to the UK economy between now and 2050.

- Approximately 23 million homes need retrofitting between now and 2050. That's 600,000 retrofits per year.

- An overhaul of the UK housing stock could save approximately 48 million tonnes of CO_2 and reduce householders' fuel bills by as much as £8.7 billion

Historic Value of Housing R&M (ONS)

2005 Constant Prices



Rethinking Refurbishment.

National Refurbishment Centre

But....

...there is still a significant gap between potential and reality in the retrofit market

> "To meet 2050 targets, we should already be retrofitting 600,000 homes a year, while in fact we are not approaching 10% of that number."
>
> - *Dr Neil Johnston, Director of Delivery, Institute For Sustainability*

.... how do we meet this challenge?

Collaboration
Evidence
Research
(**T**argets met)

Rethinking
Refurbishment.

National
Refurbishment
Centre

The NRC Partnership

bre

energy saving trust

DUPONT

British Gas

BASF
The Chemical Company

University of Salford
A Greater Manchester University

SAINT-GOBAIN

B&Q

SEA
Sustainable Energy Academy

CoRE
CENTRE OF REFURBISHMENT EXCELLENCE

KINGFISHER

gentoo group

The Daily Telegraph

Knowledge Transfer Network
Modern Built Environment

BHA
British Homes Awards 10

VELUX

Hanson
HEIDELBERGCEMENTGroup

BUILDING RESEARCH HOUSING GROUP

Homes & Communities Agency

RIBA

constructionskills

Structherm
Fastbuild | Cladding | Render

LABC

KIER

CONSTRUCTING EXCELLENCE
in the built environment

Rethinking Refurbishment.

www.rethinkingrefurbishment.com

National Refurbishment Centre

The NRC Research Programme

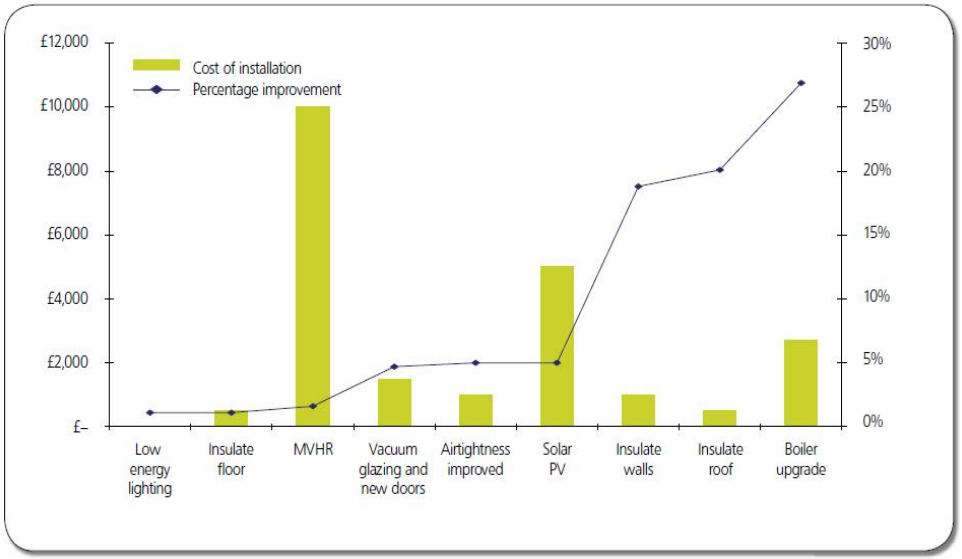
Rethinking Refurbishment.

National Refurbishment Centre

The NRC Research Programme

Evidence based Approach.

- Data collected from 500 plus exemplars;
- The largest demonstration project of its kind;
- Providing help to make practical evidence-based decisions;
- Overcome and address the barriers to refurbishment
- Before and after refurbishment tests and real life experiences



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The NRC Research Programme

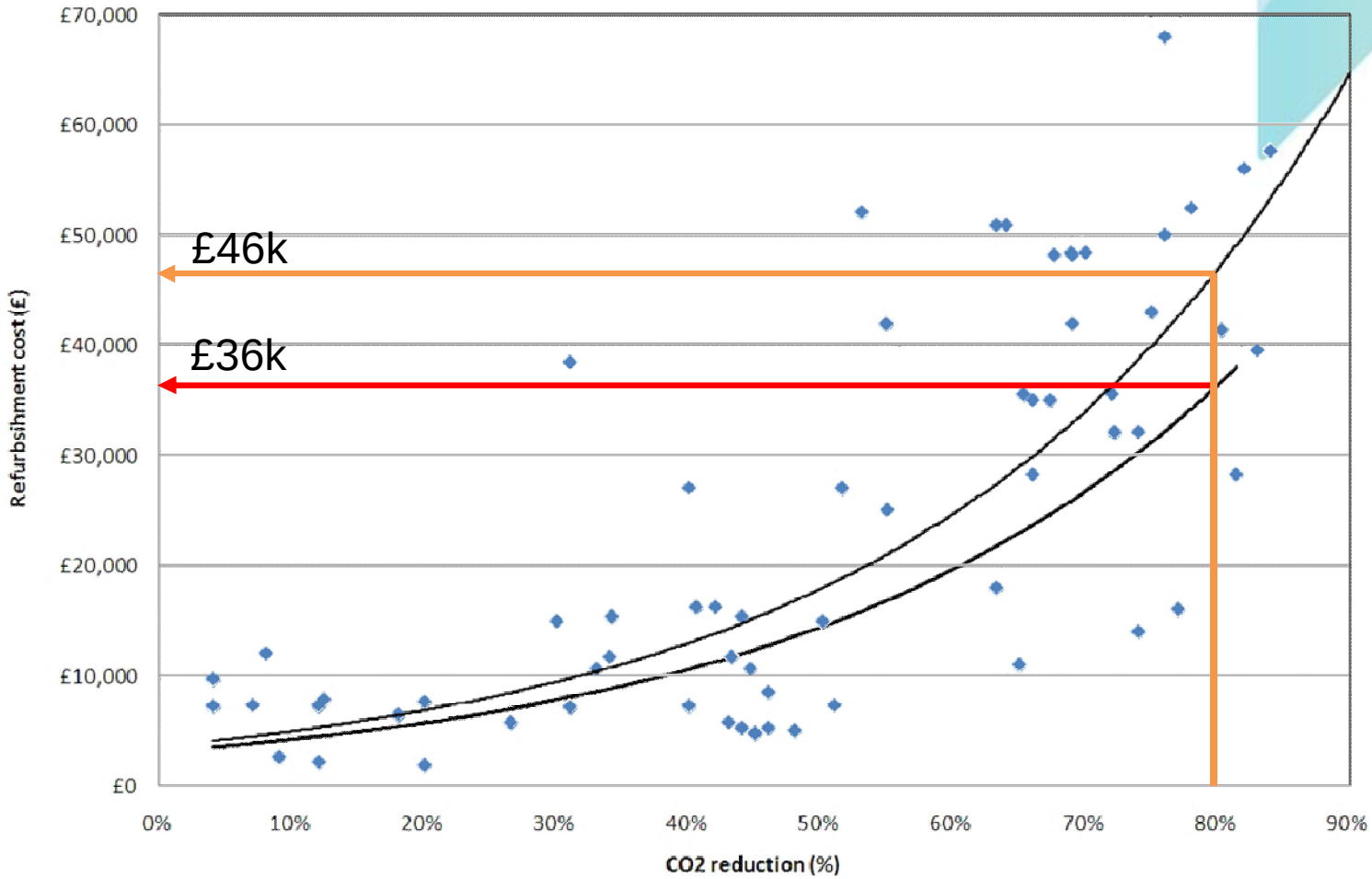
Financial and embodied carbon payback - evidence

Insulation type	Thickness of insulation (mm)	Thickness plus fixings and finishes (mm)	Loss of floor area	cost per m2(£)	Cost per m2 installed	Cost per m2 installed with CERT applied	Cost for dwelling	Financial Payback in years
Thermafleece on studding	150	160	5.30%	14.24	47	32.9	1053	**8.29**
Polyurethane spray foam	75	95	3.20%	20	28	19.6	627	**4.94**
Mineral wool	120	135	4.50%	6.98	40	28	896	**7.06**
EPS	90	130	4.30%	7.67	41	28.7	918	**7.23**
Phenolic foam	60	100	3.30%	9.37	42	29.4	941	**7.41**
Spacetherm	40	50	1.70%	46.56	56	39.2	1254	**9.88**
Hemcrete insulation 220	150	150	5.10%	19.8	26.4	18.48	591	**4.66**

(Elevate project)

NRC Research Programme - 2012

Comparison – to be validated



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www.rethinkingrefurbishment.com

National Refurbishment Centre

Refurbishment Portal

The refurbishment comparison tool providing evidence about energy efficiency from real homes

Click Here to start

Exemplar Map

Click the map to see the independent and industry-led refurbishment projects that span the length and breadth of the UK.

You can also learn more about key exemplar projects that partners have been involved in, including the Victorian Terrace project and Retrofit for the Future.

Click here to find out more

See all news

News from Building4Change

6/9/2011
Electric vehicles: the road ahead

Justin Hayward, director of CIR Strategy, charts the development of the electric vehicle sector in the run up to the EV2BE Conference at BRE on 27 September.

6/9/2011
The growing use of wood biomass

New BRE report shows that supply and demand of biomass is on the increase.

5/9/2011
Twenty four projects to demonstrate building resilience

Developers, local authorities and consultants all lead on latest round of Design for future climate projects.

5/9/2011
Monitoring for the elderly among CIOB innovation winners

CIOB International Innovation and Research Awards will be presented at INSITE11.

See all news

Internet

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The NRC Dissemination

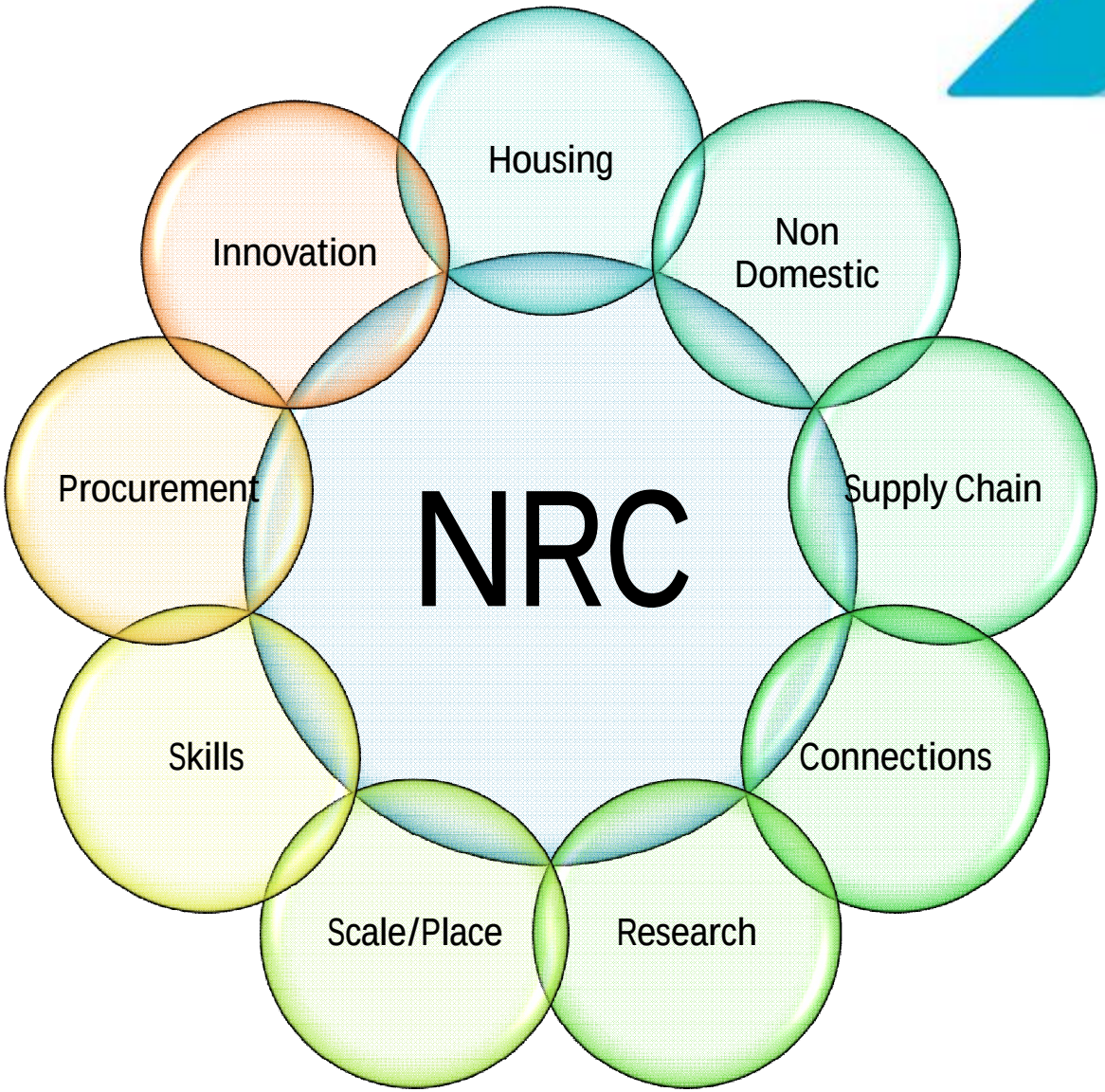
Dissemination and knowledge transfer :

- Website, Linkedin#, Twitter
- Nationwide Seminars and talks on rethinking refurbishment
- Ecobuild exhibition and talks
- Insite11
- Nationwide Industry consultation and online survey

External Influencing

- Connection into DECC - Green Deal
- Rethinking Refurbishment England Report
- Submission into DECC's call for evidence

Rethinking Refurbishment.



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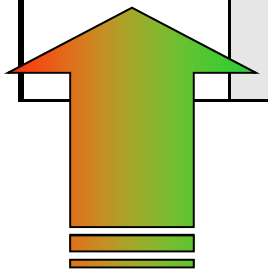
Future – Collaboration
BHRG
Leader/pioneers
HCA

Future – Evidence
Oversight/Evaluation
AGMA

Future Research
Tenure
Scale

Maturity assessment - planning & partnerships

	Base		Resources			Activities		
Theme ***5 E's***	**Partnership Governance & Leadership** ***Enable***	**Evidence & Monitoring** ***Evidence***	**Finance & Investment** ***Enable***	**Planning, Development & Regulatory Control** ***Encourage/ Enforce***	**Skills & Knowledge** ***Enable/ Educate***	**Industry & Business Development** ***Enable/ Educate***	**Procurement** ***Encourage/ Enforce***	**Cultural & Social Factors** ***Encourage***
Theme Description **Maturity Level**	***The extent to which a partnership approach to retrofit is in place and the capacity and leadership strength of***	***The use made of a robust evidence base and / or management measurement approaches to monitor progress of building stock improvement measures***	***The availability of financial and investment resources to deliver***	***Activity which is focused on using planning, development & regulatory control powers to deliver retrofit outcomes***	***The development of an adequate supply of people with the right skills and knowledge to deliver retrofit outcomes whether in the existing work-force or as new entrants***	***The degree to which activity is aiding the growth of existing businesses or the creation of new businesses that are focused upon carbon reduction achievements***	***The use of existing and new public and private sector procurement to deliver retrofit outcomes – buying power.***	***The degree to which social and cultural factors are addressed through the partnership's activity***



Rethinking Refurbishment.

National Refurbishment Centre

www.rethinkingrefurbishment.com

www.linkedin.com

www.twitter.com

Many thanks

Chris Ward-Brown - Chairman
CWB@rethinkingrefurbishment.com

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National Refurbishment Centre

Question/Debate Session

Part of the BRE Trust

Front line case studies – lessons for Green Deal

Nick Jones – Technical Director for Refurbishment

A role for exemplars

Early indication of ‘promising’ technologies

Areas for further product development

Practical issues for addressing – design, selection installation

Feedback into likely ‘real world’ performance of measures.

Green Deal

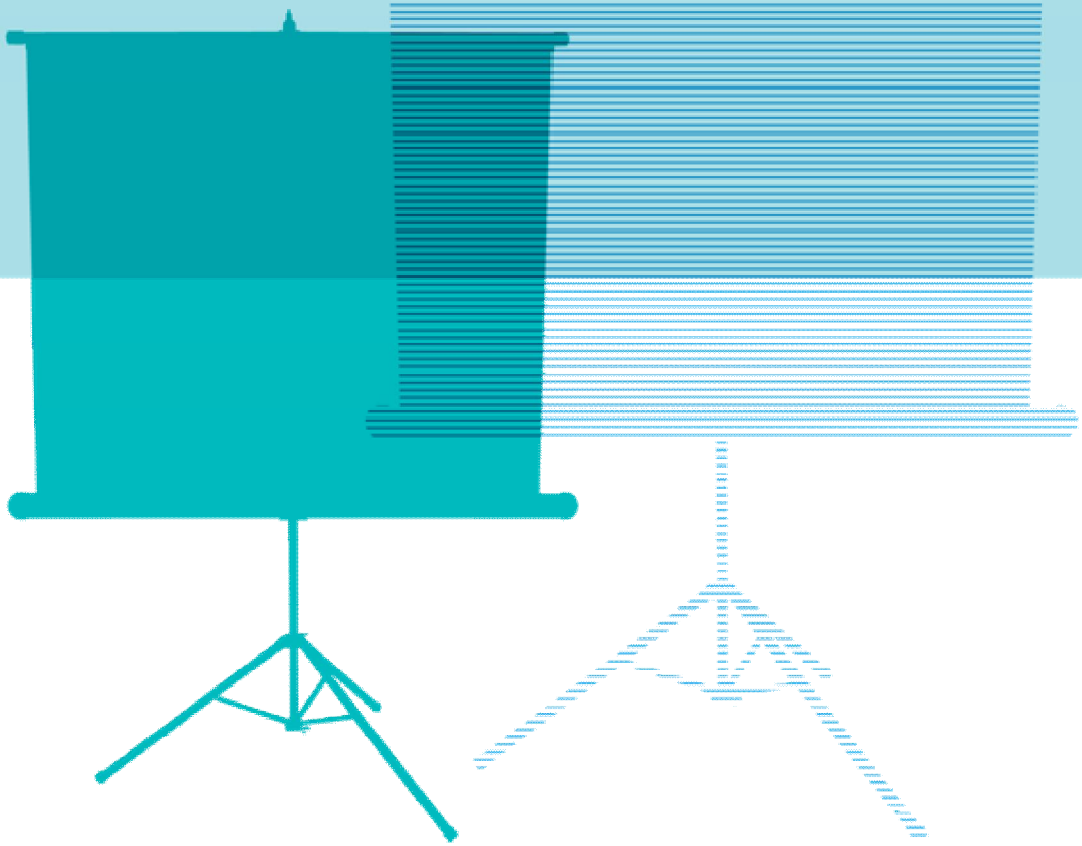
Homeowners minor works – overall ‘protection’ for providers and homeowners

Social Housing – better understanding of issues for major refurbishment

Providers – importance of sequencing the ‘refurbishment journey’

Greener homes for Redbridge

Refurbishment of 20 houses to varying levels of performance



Client driver

- To gain a detailed understanding of the cost variations for different levels of sustainable refurbishment
- To identify the ‘optimum’ level of refurbishment for different dwelling types and budgets
- To identify a ‘new’ scale of environmental performance for existing homes.

Range of measures for each house type – stepping up in sustainability

	Work stream 1 - Decent Homes measures																		Work stream 1 - Sustainability measures																							
House type	New Kitchen	New bathroom	Test electrics, boiler, CH	Provide window restrictors at 1st floor	Dulux EcoSure to all areas	remove carpets and provide hard board	Install smoke and CO detectors	Install airbricks	Dual Flush 4/2	Siphon valve to WC	Spray taps and flow regulators to all taps - 8 l/min	156l bath	Reduced flow shower - 8 l/min	Water butt	Water meter	Water data logger	Smart meter	Tiny tags installed temperature & relative humidity measurements	250mm Loft insuation - U value 0.16 W/m²K	Dry lining insulation to external walls - U value 0.35 W/m²K	Cavity wall insulation	Improved air tightness	2 solar panel and 215l how water cylinder	PV - 0.53kWp	PV - 1.11kWp	A Rated low NOx condesing boiler	Thermostat and programmer in line with CHeSS	TRV to all radiators	Weather compensator	New Thermostat	100% low energy light fittings	LED lighting to ground floor	SAP Q extract fans installed	FSC Timber frame double glazed windows - U value - 1.8 W/m²K	FSC timber used wherever possible	Carpet with Recycled backing	Home Office Space	External clothes dryer	Waste and recycling storage to BS 5906	Compost Bin	Site Waste Management Plan implemented	Ecological improvements to the garden	A++ Fridge Freezer and A+ Washing Machine
2									■				■						■														■	■	■					■	■		■		
5										■			■	■					■														■		■					■	■		■		
6										■	■		■	■					■														■		■								■		
7										■	■		■	■					■												■		■		■	■				■			■		
8										■			■						■														■		■								■		
14										■			■	■					■							■							■		■					■			■		
15													■						■														■		■					■			■		
18																			■														■								■		■		
20																			■														■		■					■			■		
1									■		■	■	■	■					■	■		■	■	■		■	■	■	■				■		■	■			■	■	■	■	■	■	
3									■		■	■	■	■					■	■		■	■	■		■	■	■	■				■		■				■	■	■	■	■	■	
4									■		■	■	■	■					■	■		■	■	■		■	■	■	■				■		■				■	■	■	■	■	■	
9									■		■	■	■	■					■	■		■	■	■		■	■	■	■				■		■	■			■	■	■	■	■	■	
10									■		■	■	■	■					■	■		■	■	■		■	■	■	■				■		■	■			■	■	■	■	■	■	
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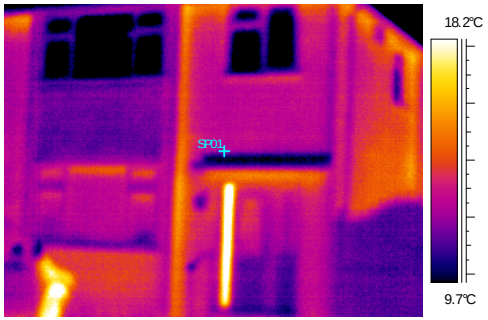
12									■		■	■	■	■					■	■		■	■	■		■	■	■	■				■		■	■			■	■	■	■	■	■	
13									■		■	■	■	■					■	■		■	■		■	■	■	■	■				■		■	■			■	■	■	■	■	■	
16									■		■	■	■	■						■		■			■	■	■	■	■				■		■	■			■	■	■	■	■	■	
17									■		■		■		■	■	■	■		■	■	■			■	■	■	■	■				■		■	■	■	■	■	■	■	■	■	■	■
19																			■														■		■					■			■		

Decent Homes Plus refurbishment – 1950s Semi

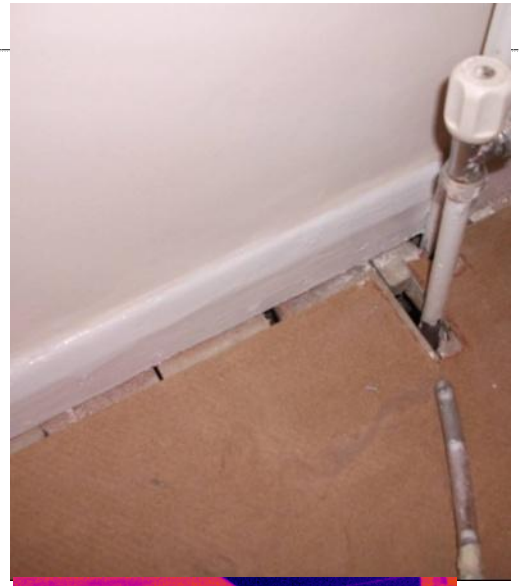
- Significant air leakage:
  - Loft hatch
  - Holes in floor and ceiling
  - Decommissioned warm air c/h system
  - Bathroom service pipes
- Uniform heat loss:
  - Cold air leaking up from floor void
  - Loss at eaves
  - Cold air in from window casements



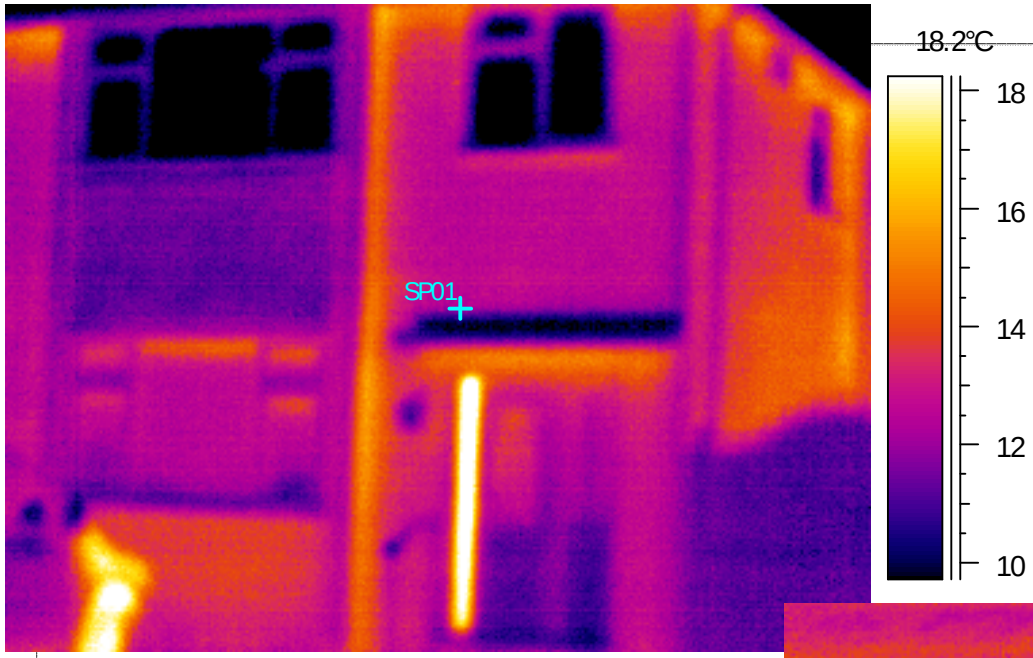
	Existing performance of dwelling						
	Bed	Dwelling Type	Approx. date of construction	Airtightness ($m^3/m^2/hr$ @ 50Pa)	Current kg CO_2 emissions	Band	SAP
House A	3b	Semi Detached	1950s	10.6	8,979	F	38

Decent Homes Plus refurbishment – 1950s Semi

- Improvements:
  - Loft insulation (0.16)
  - 100% CFLs
- Still air leakage:
  - Gaps around boards
  - Gaps around service pipes
- Still heat loss:
  - Walls not improved
  - Cold air ingress
  - But: warm ceiling!



Improvements and performance of dwelling				Proposed ratings of dwelling		
Environmental Works	Airtightness ($m^3/m^2/hr$ @ 50Pa)	Post refurb kg CO_2 emissions	Est % reduction in CO_2	Band	SAP	
Loft insulation, with 100% CFL	10.3	6,873	23%	D	59	-


SP01
18.2°C
18
16
14
12
10

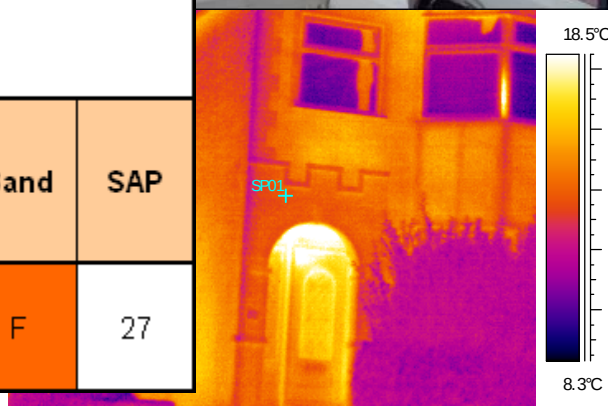

SP01
7.4°C
6
4
2
0
-2
-4
-5.1°C

Highly sustainable refurbishment – 1930s End terrace

- Significant air leakage:
  - Crack in bay window
  - Window casements
  - Ceiling and floor

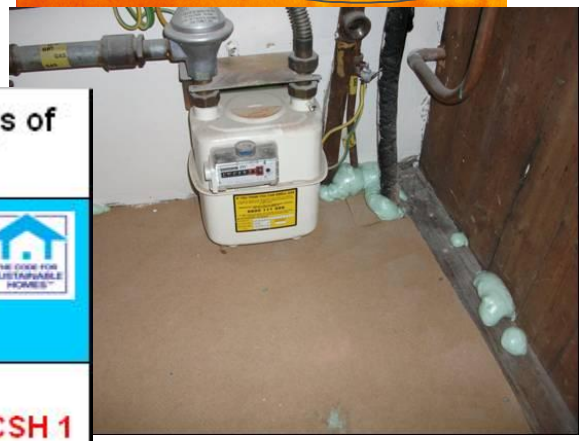
- Uniform heat loss:
  - Cold air leaking up from floor void
  - Loss at eaves
  - Loss in front bay

	Existing performance of dwelling						
	Bed	Dwelling Type	Approx. date of construction	Airtightness ($m^3/m^2/hr$ @ 50Pa)	Current kg CO_2 emissions	Band	SAP
House B	3b	End Terrace	1930s	12.4	8,328	F	27



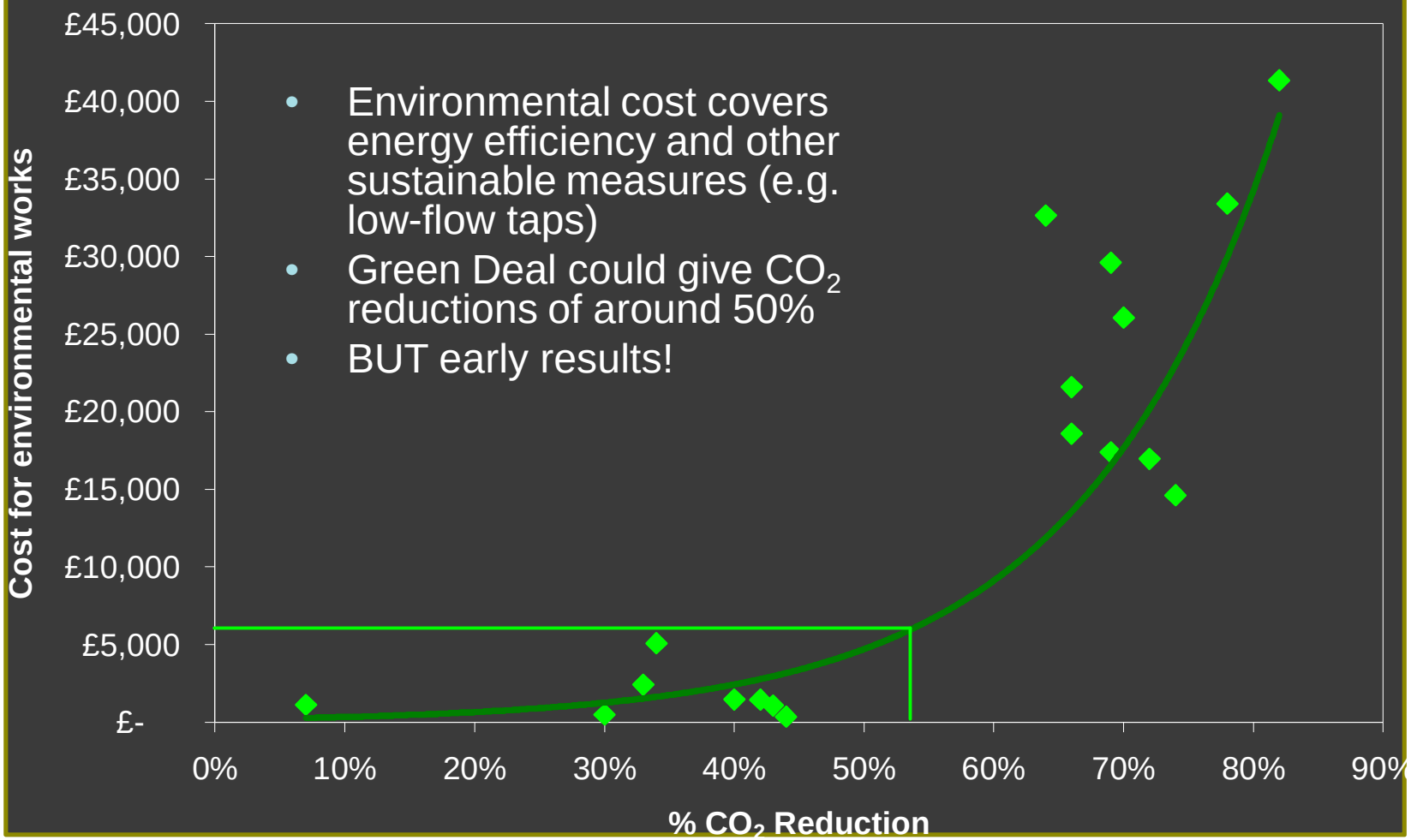
Highly sustainable refurbishment – 1930s End terrace

- Reduced air leakage:
  - Most floor gaps filled
  - Still gaps around window casements
- Reduced heat loss:
  - Still some wall heat loss
  - Some cold air ingress at windows
  - Cold floor



Improvements and performance of dwelling				Proposed ratings of dwelling		
Environmental Works	Airtightness ($m^3/m^2/hr$ @ 50Pa)	Post refurb kg CO_2 emissions	Est % reduction in CO_2	Band	SAP	
Loft and internal wall insulation, improved heating, 100% CFL, Solar thermal and PV	8.4	2,329	82%	B	83	CSH 1

Cost of environmental works vs CO_2 reduction



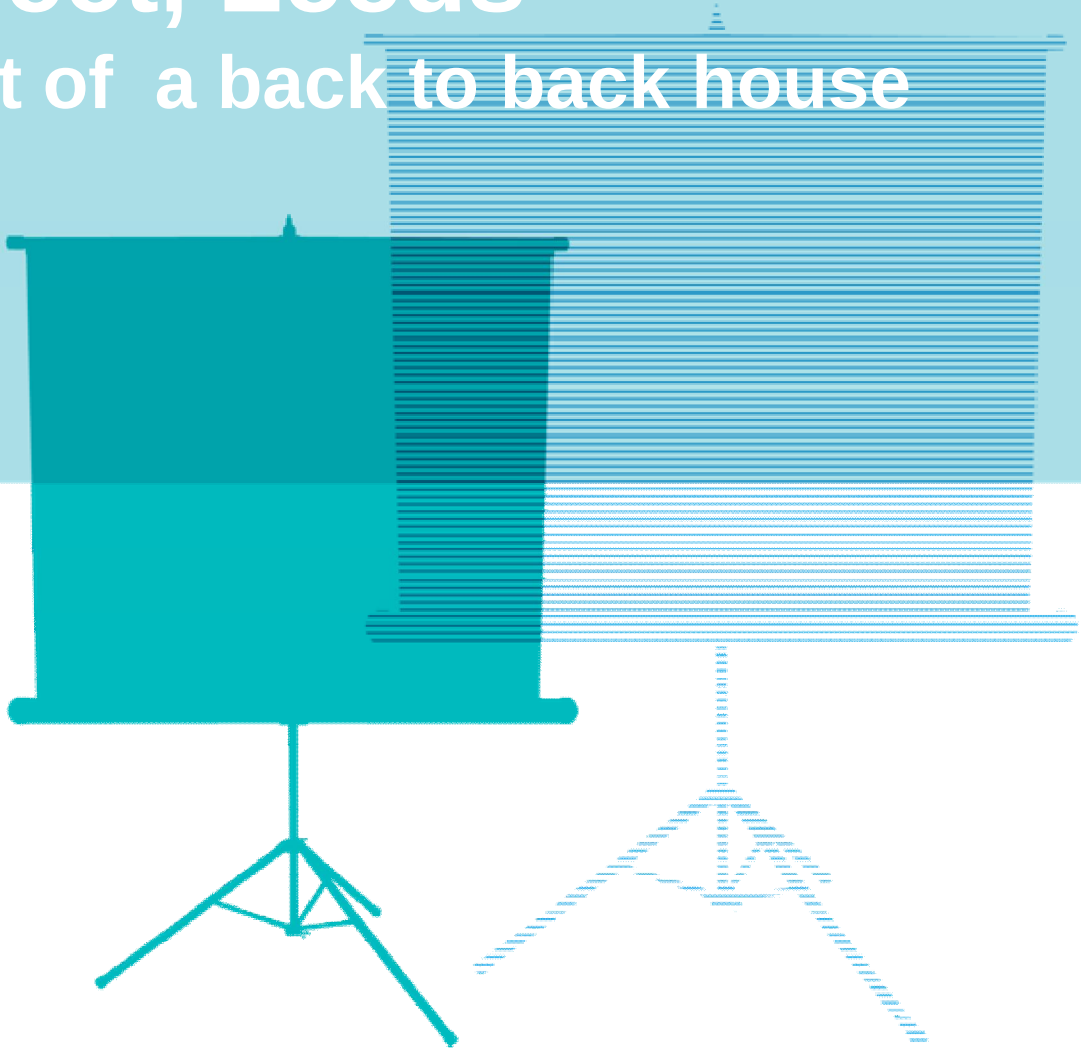
- Environmental cost covers energy efficiency and other sustainable measures (e.g. low-flow taps)
- Green Deal could give CO_2 reductions of around 50%
- BUT early results!

Key lessons

- Contractor needs clear understanding of brief at tender stage – think Noddy!
- Full SAP modelling carried out and not RdSAP
- Look for Issues that affect performance – even if they cannot be modelled.
- Code for Sustainable Existing Homes > BREEAM for Domestic refurbishment

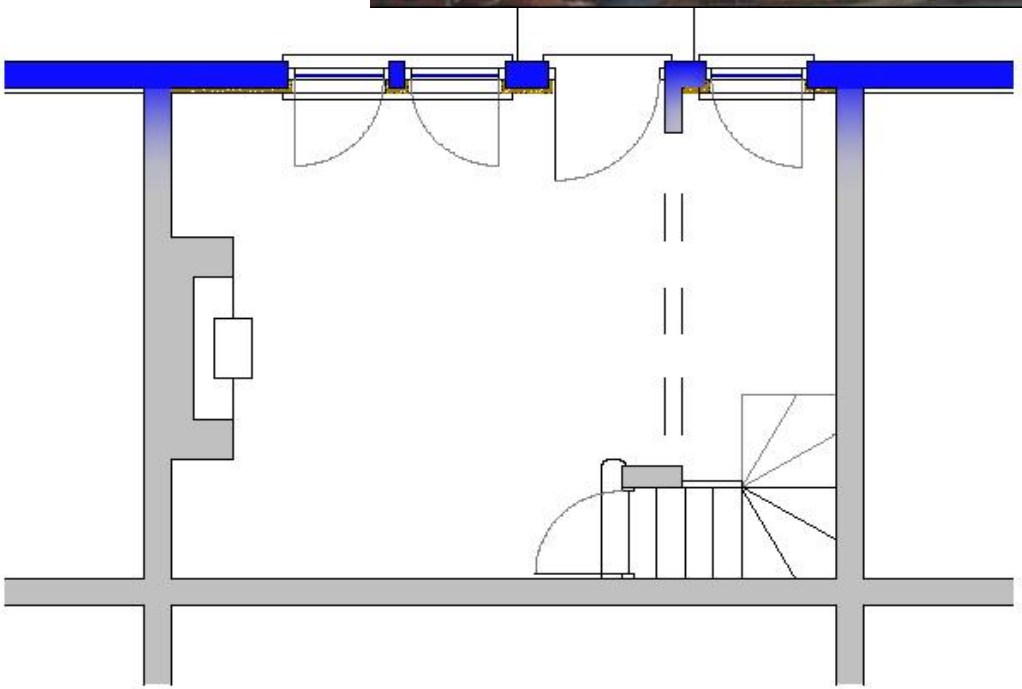
Sefton Street, Leeds

Refurbishment of a back to back house



Key issues

- Large local stock c.19,000 in Leeds
- Poor thermal performance
- Single frontage
- Small footprint

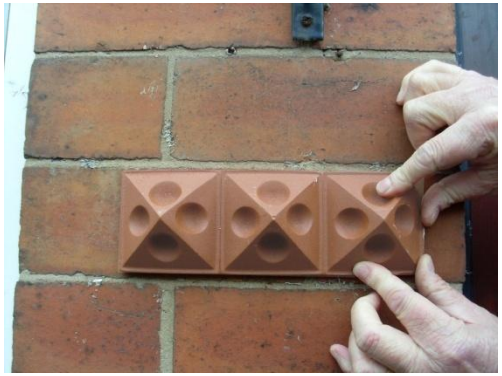


Key changes

- Wall insulation, internal and external
- Roof insulation
- Removing and roofing over chimney, removing secondary heating gas fire
- Moving from Grade E windows to Grade A
- Moving from 1.9 to 1.1 U-value doors
- New efficient boiler and controls
- “Mixed Mode“ ventilation (i.e. PSV and extract fans)
- Improving airtightness

External wall insulation was considered…..

Special Corbel bricks



Special string course bricks

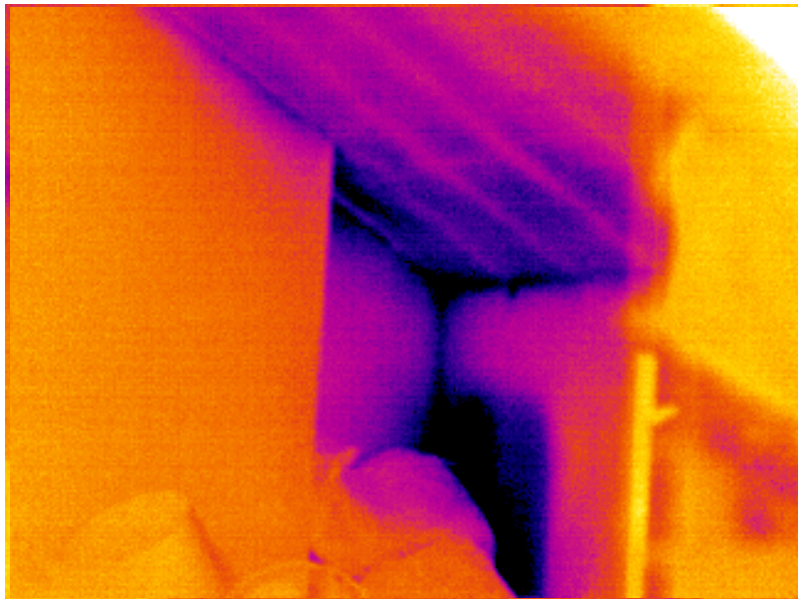
Special lintels

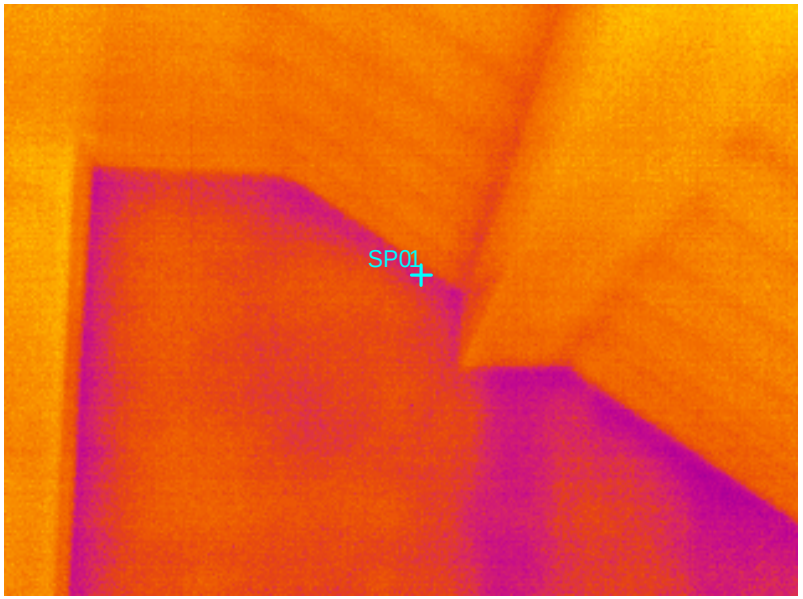
Common bricks

- But Leeds CC Planning department would not approve
- So used internal wall solution (Aerogel)

Roof insulation

Before: U = 2.2 After: U = 0.16

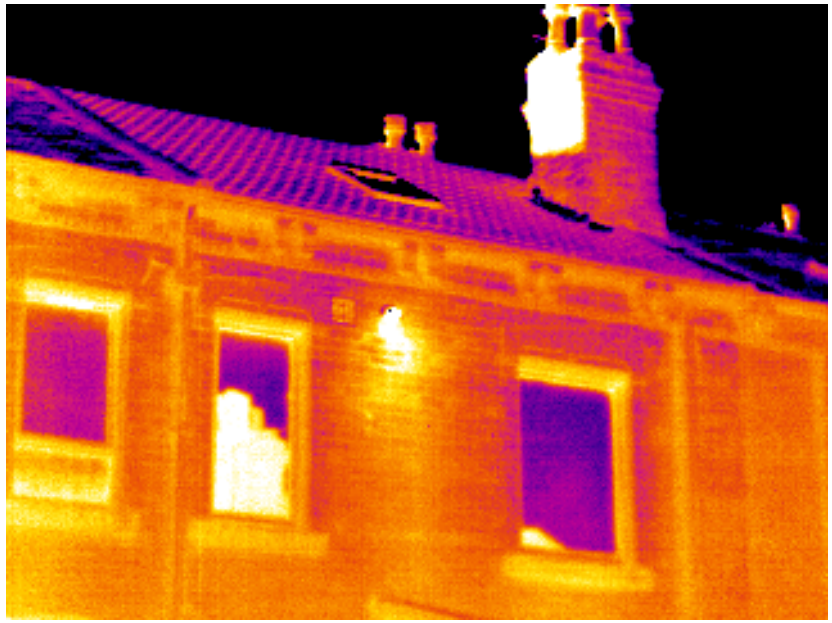


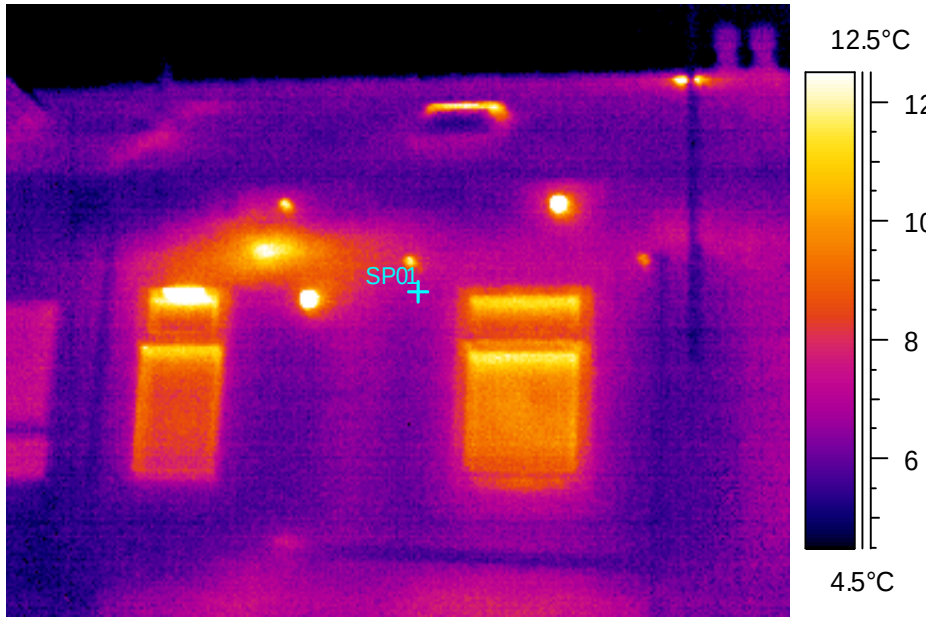


Cost : £880 Saving p.a.: £181 Payback: 4.85 yrs

Wall insulation

Before: U = 2.1 **After: U = 0.35**

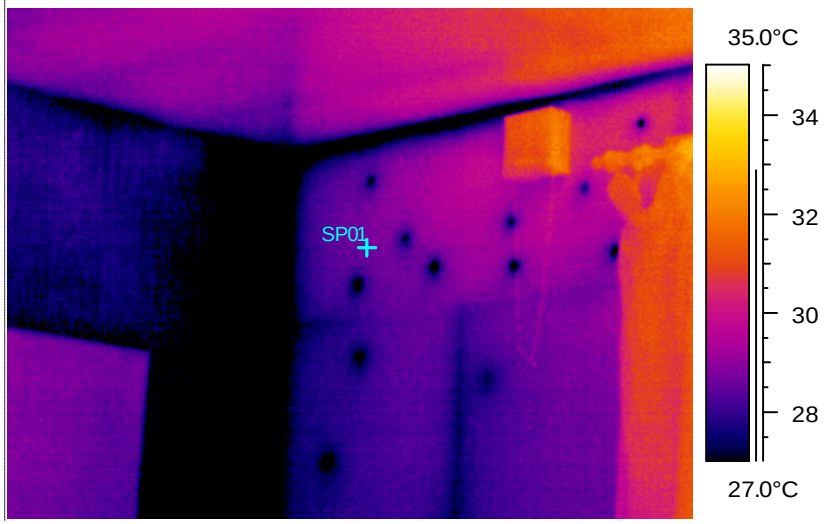




Cost: £3,715 Savings p.a.: £191 Payback: 18.7 yrs

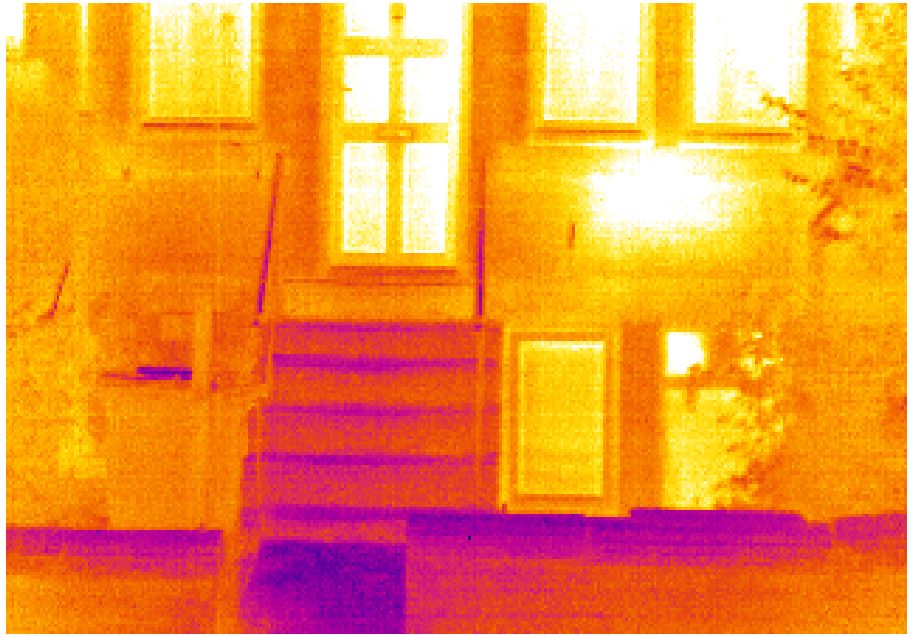
Internal wall insulation (aerogel)

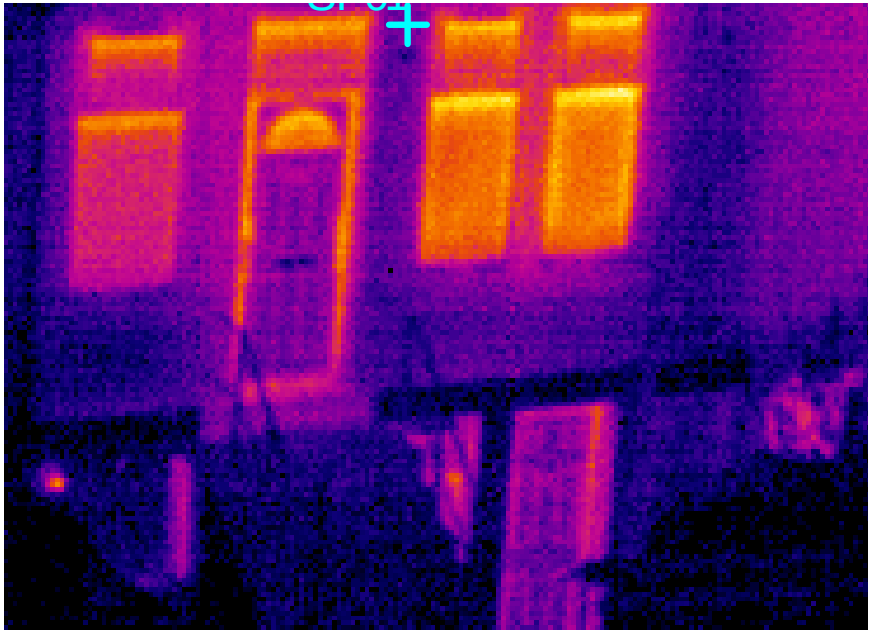
- Internal loss of space – aerogel
- PU was 40% cheaper but 65mm thickness penalty
- Fixing problematic.
- Could advice overcome loss of space?



Windows and doors

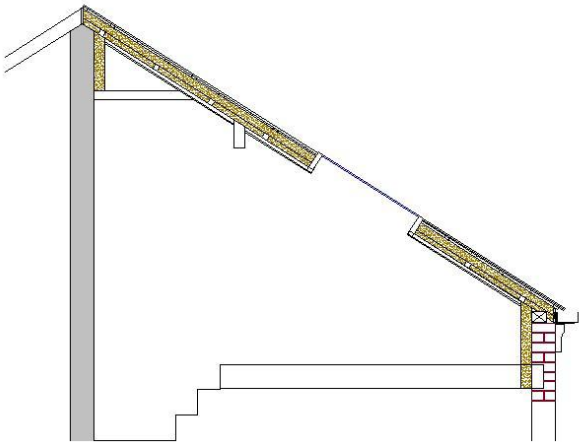
Usual spec: U = 1.9 **Grade A U = 1.3**

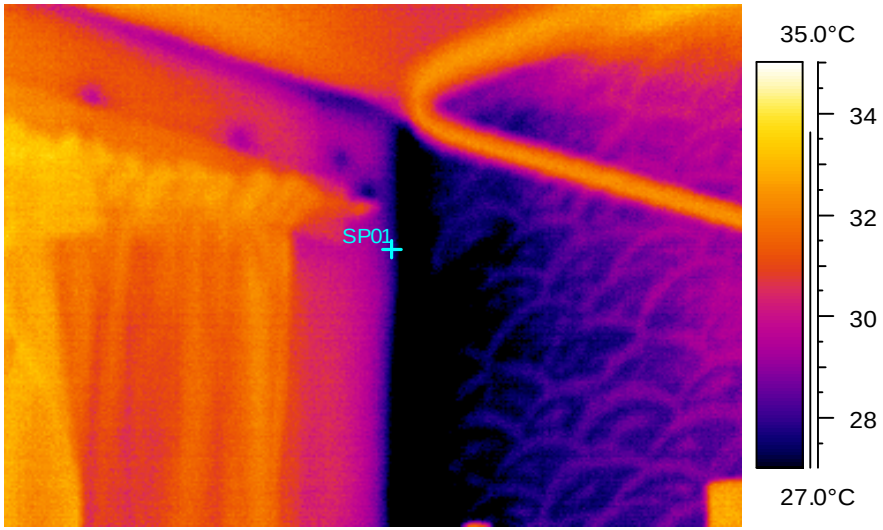




Usual cost:	£2,555	£2,957
Payback:	41.1 yrs	42.6 yrs
Differential	£402	1.5 yrs

Bridging issues and solutions





- Roof space
- Party walls
- Floor zones
- Basement walls

Key results and lessons learnt

- Slightly above target at £12,600 over usual Group Repair cost
- SAP/EPC Rating raised from 59 D to 83 B

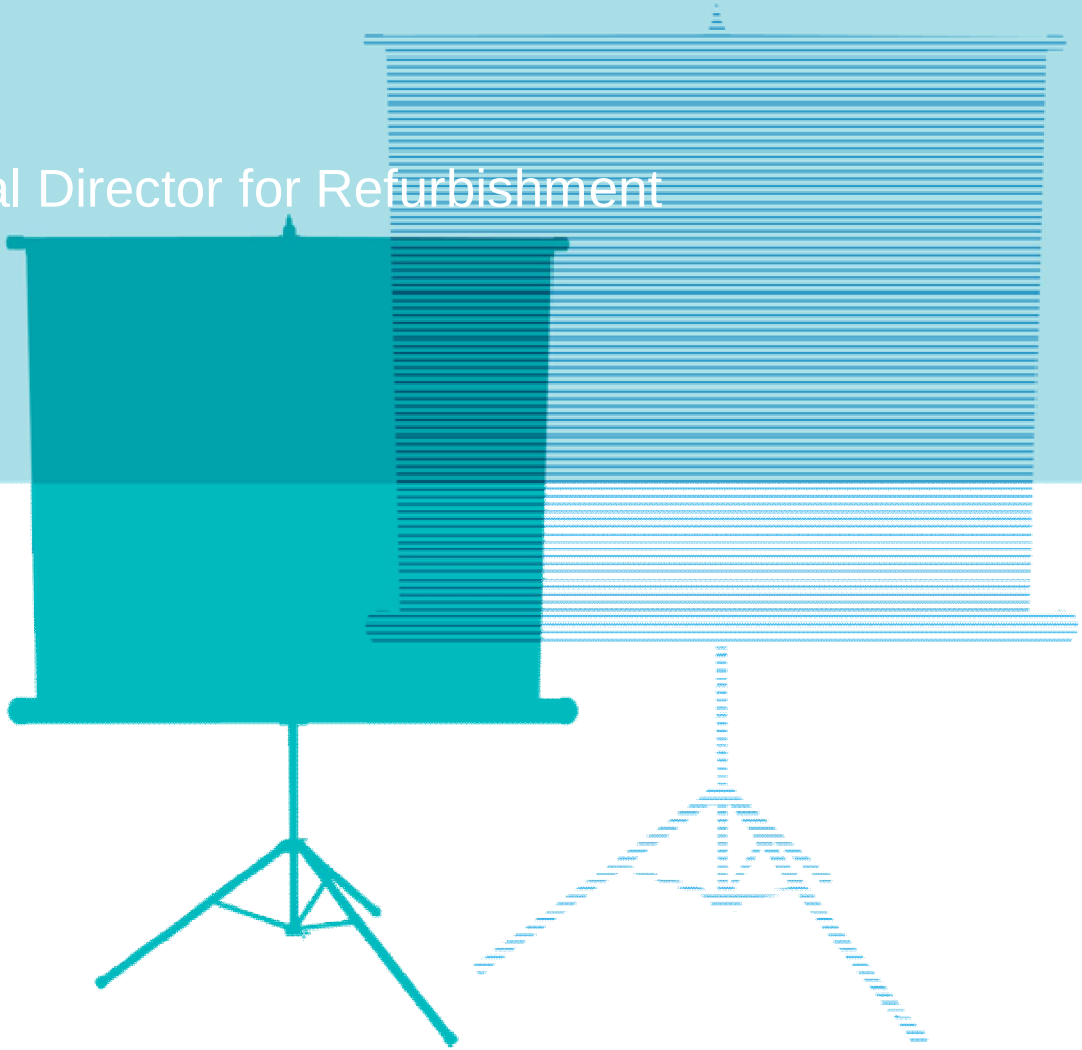
- What's best for the building and the people
- Conflicting aims within Local Government (i.e. planning vs housing)
- Local limits to national initiatives (i.e. external wall insulation challenge)
- Good will and engagement of workforce
- Delivering best practice advice

Key lessons

- Trials are essential for testing new products and approaches and developing future solutions.
- Code for Sustainable Existing Homes > BREEAM for Domestic refurbishment
- Contractor needs clear understanding of brief at tender stage – think Noddy!
- Full SAP modelling carried out and not RdSAP
- Look for Issues that affect performance – even if they cannot be modelled.

Front line case studies – lessons for Green Deal

Nick Jones – Technical Director for Refurbishment



BRE Models the Green Deal and the Energy Company Obligation

Part of the BRE Trust

Green Deal and the Energy Company Obligation

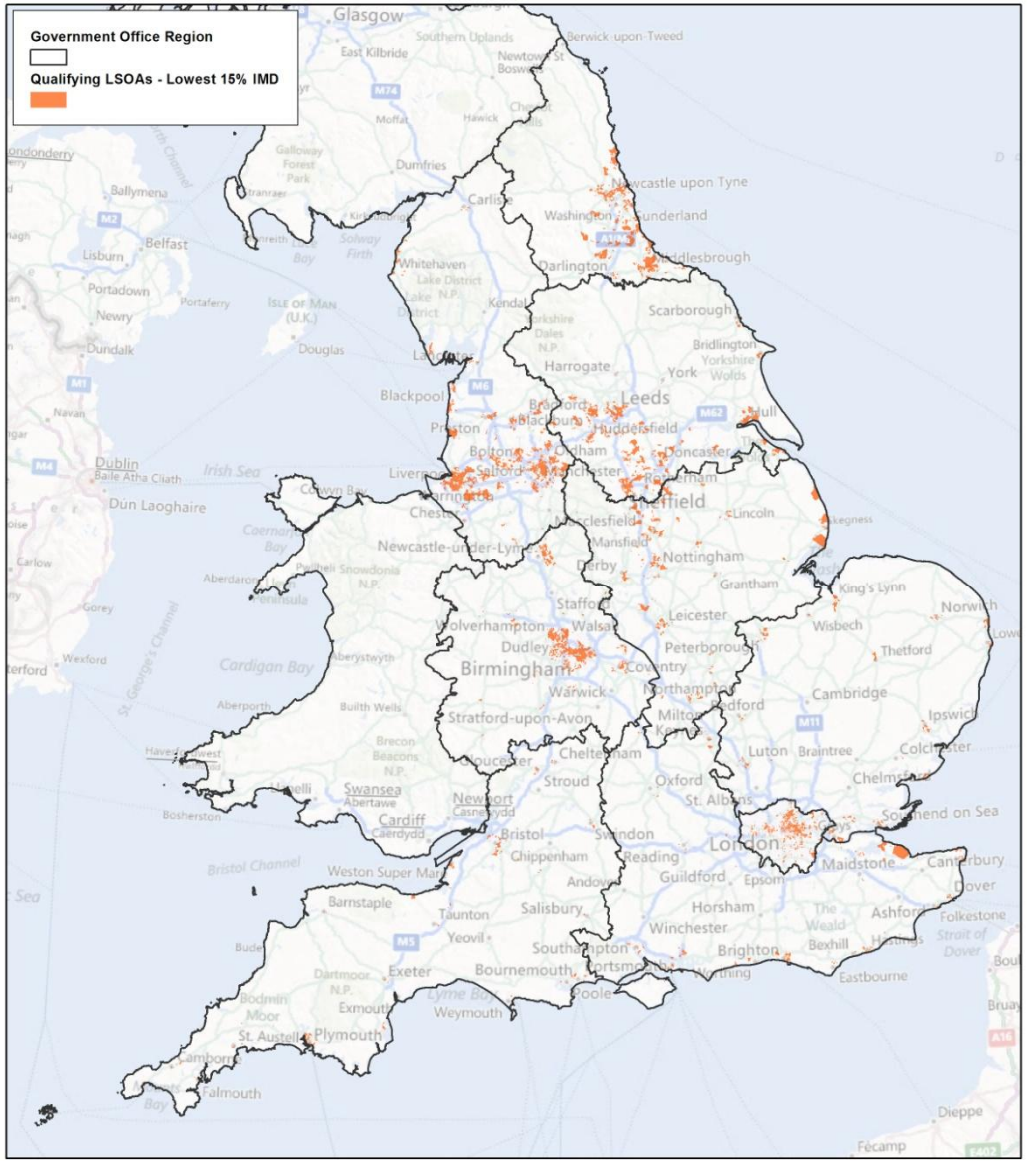
- BRE dwelling level stock models
- Include dwelling level predictions of :
  - Presence of solid walls
  - Presence of cavity walls and cavity wall insulation
  - Requirement for loft insulation
  - Boiler type
  - Low income households
- Coverage: currently England, Scotland in development
- Impact of 8 improvement scenarios but other combinations can be modelled
- Based on BRE Domestic Energy Model which is basis of SAP
- Inputs from Experian and national housing surveys
- Used for strategic and targeting purposes

Energy Company Obligation Example

- Energy Suppliers obliged to spend £1.3 billion p.a.
- Carbon saving:heating cost reductions 75:25 split
- Affordable warmth £350m p.a.
  - Eligible if low income/on benefit and private tenure
  - Measures that reduce notional cost of heating (based on SAP)
- Carbon Savings £760m p.a.
  - All tenures eligible
  - Cavity and solid wall insulation
- Carbon Saving Communities £190m p.a.
  - Eligible if in lowest 15% of Super Output Areas in Index of Multiple Deprivation
  - 20% can be spent in areas adjacent to IOD lowest 15%
  - 15% to be spent in rural low income areas
  - Loft, cavity and solid wall insulation

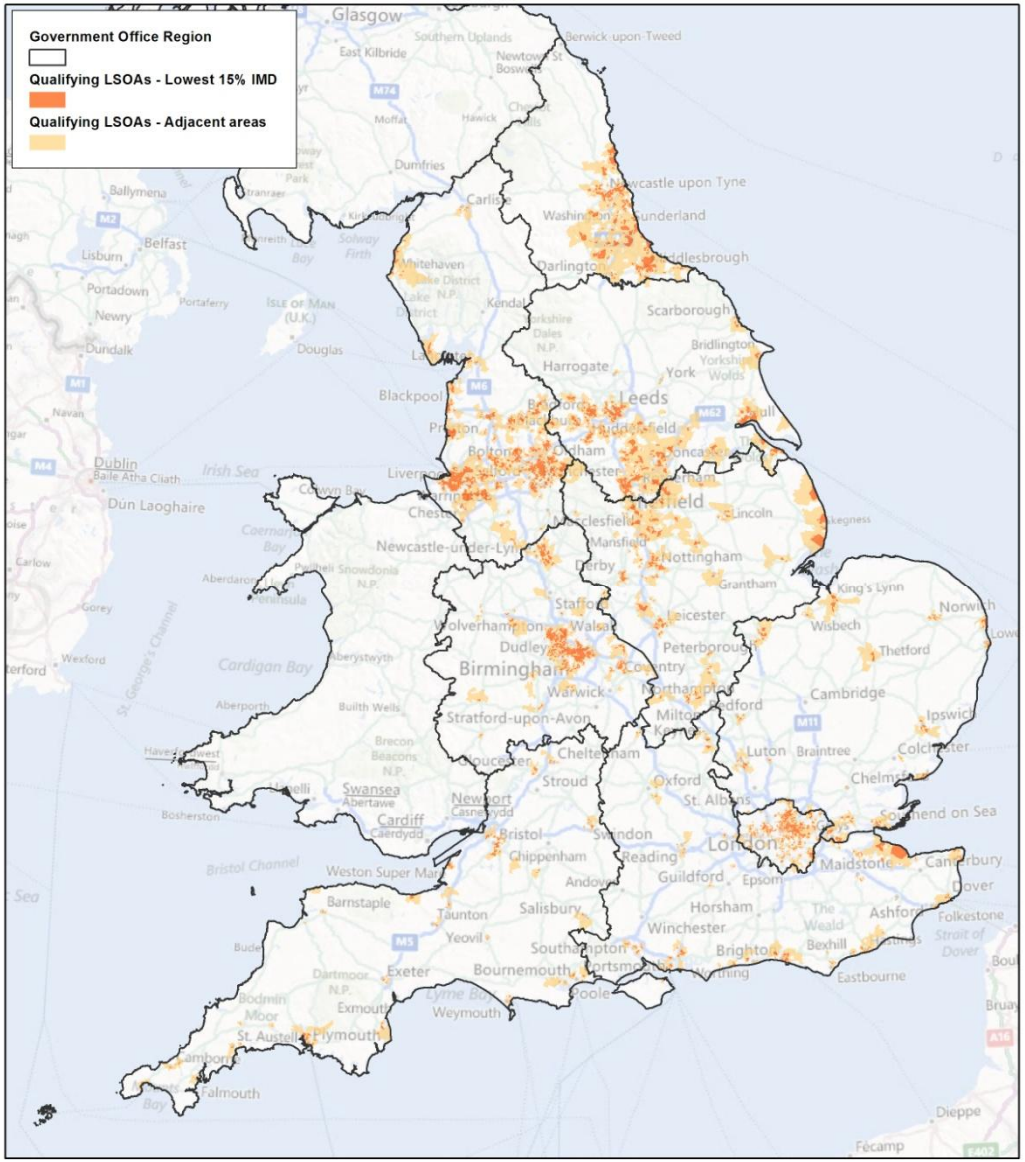
Lowest 15%- Index of Multiple Deprivation (IMD)

- Carbon Saving Communities £190m p.a.
  - Eligible if in lowest 15% of Super Output Areas in Index of Multiple Deprivation
  - All tenures
  - Loft, cavity and solid wall insulation



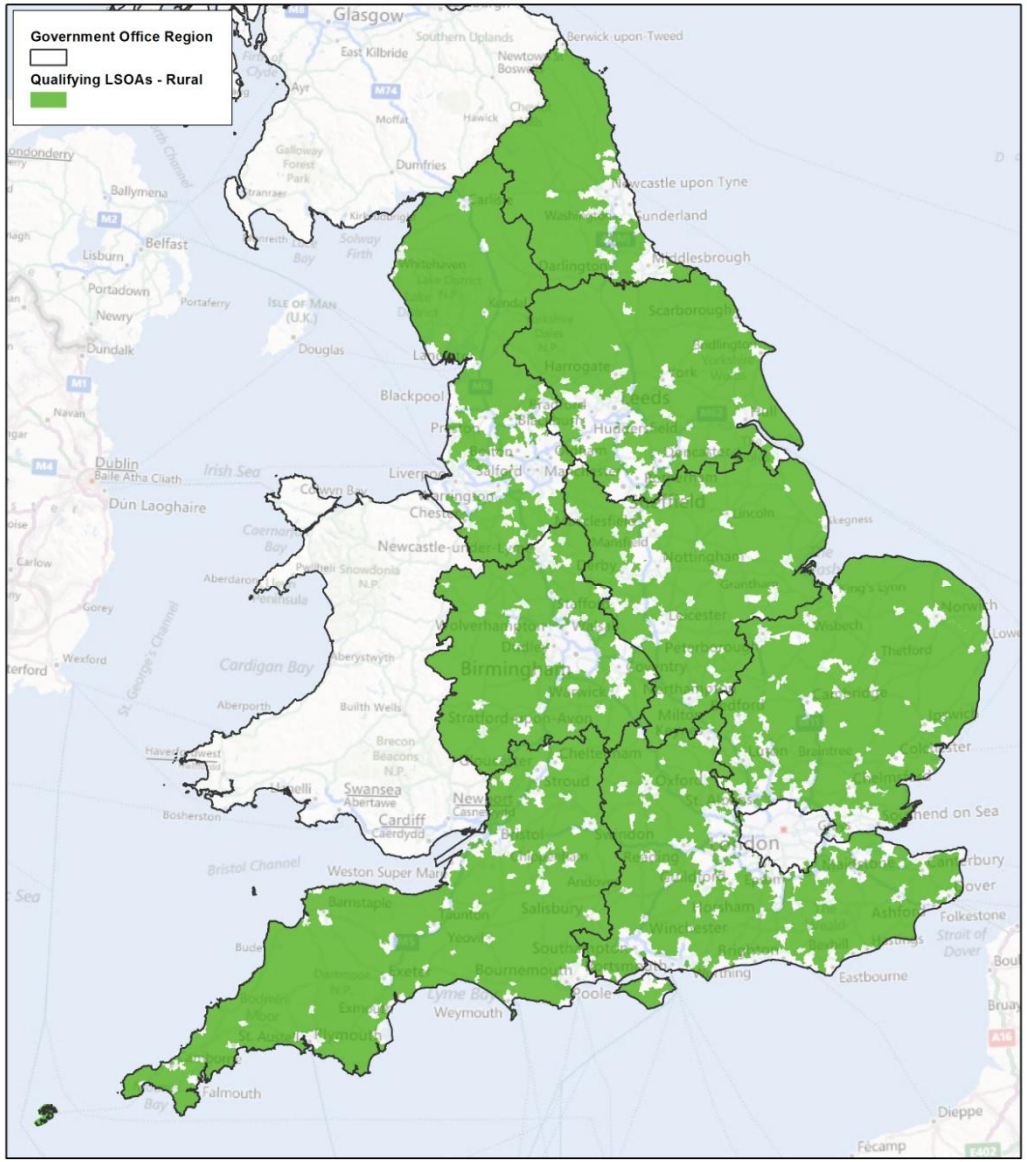
Lowest 15% IMD and the adjacent areas

- 20% of the Carbon Saving Communities £190m can be spent in areas adjacent to IOD lowest 15%
- All tenures
- Loft, cavity and solid wall insulation

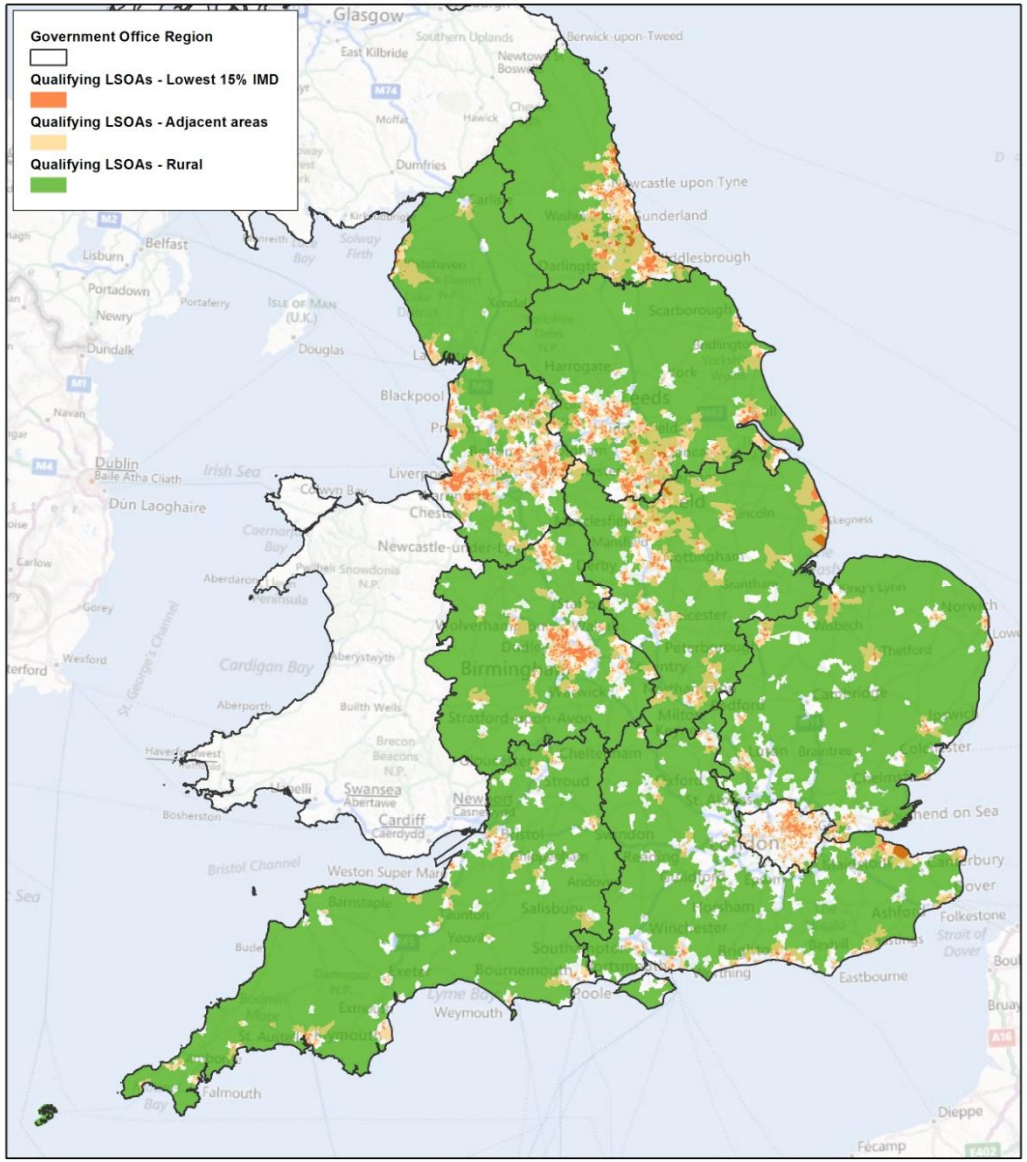


Rural classification - ONS

- 15% of £190m to be spent in rural low income areas
- Rural settlements are less than 10,000 homes
- Individual households eligibility income/benefit based
- Cross tenure
- Loft, cavity and solid wall insulation

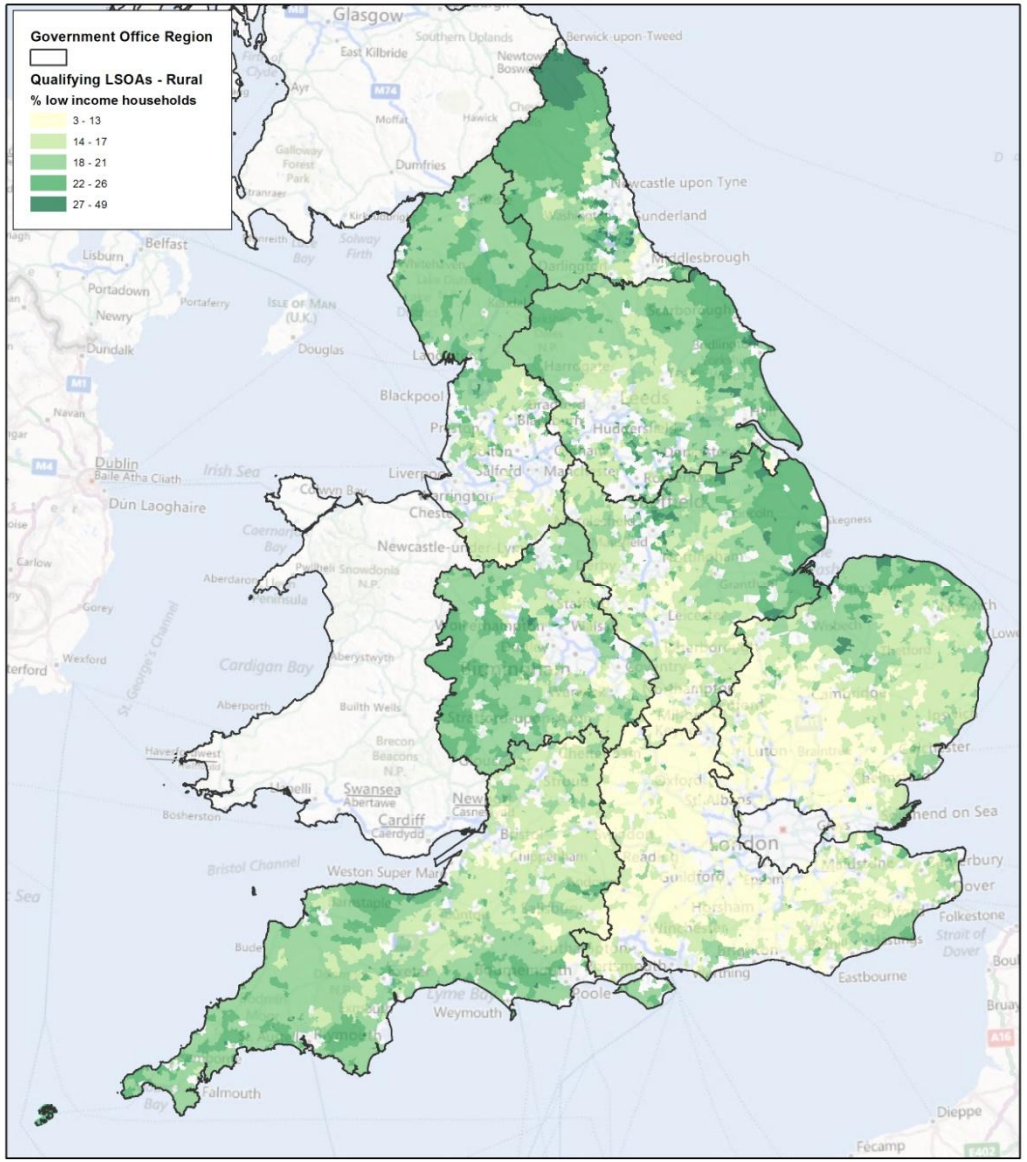


Lowest 15%IMD, the adjacent areas and rural



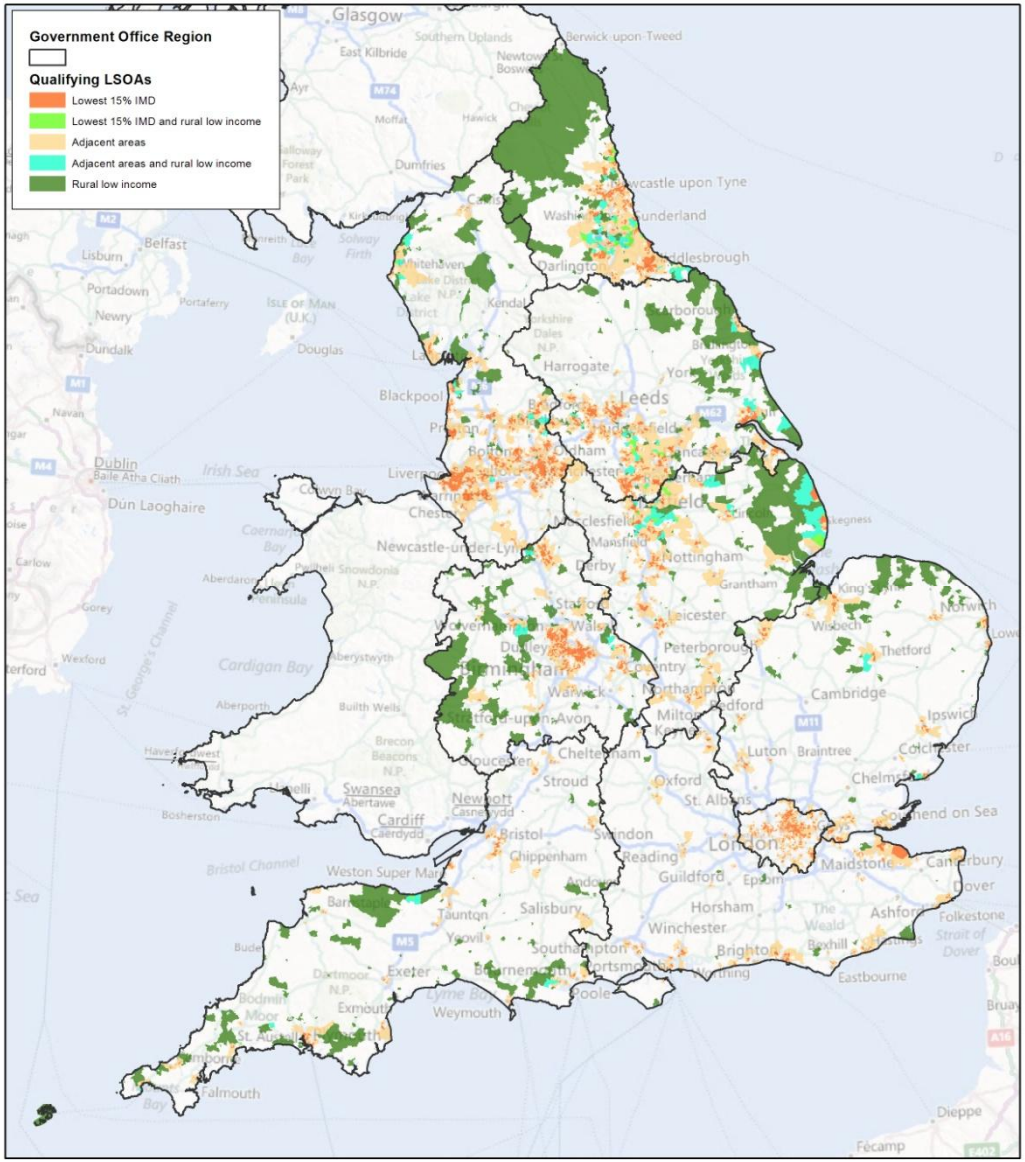
Rural with BRE Low Income (LI) Model

- BRE Low income model demonstrates distribution of low income rural households
- Useful to understand where 15% of the £190m likely to be spent



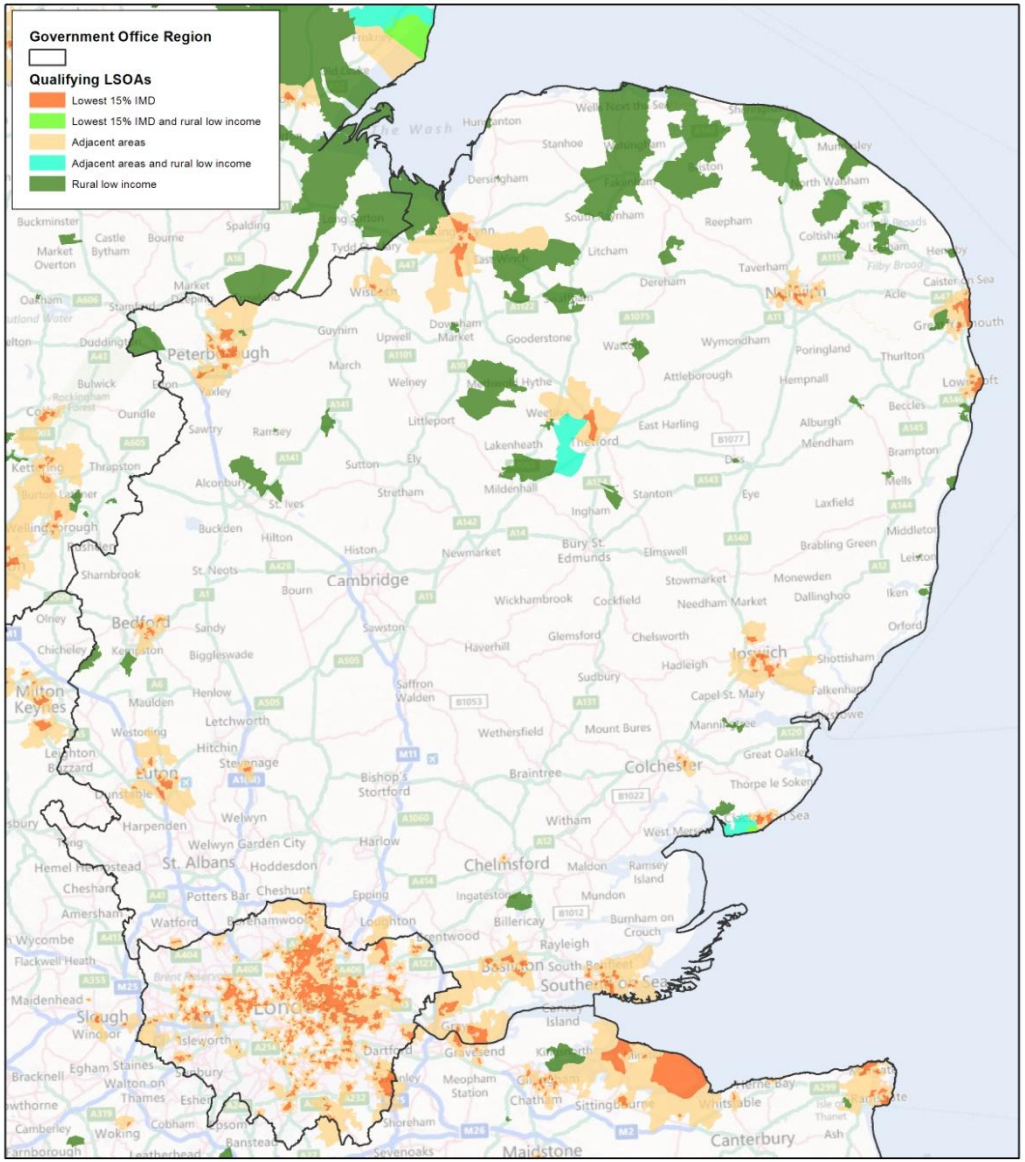
15% IMD, adjacent areas and LI rural

- Dark Green areas have greater than average levels of low income
- Relatively few rural areas
- Most low income areas are urban
- Light green areas are rural and IMD lowest 15% or adjacent area so already target areas



15% IMD, adjacent areas and LI rural

- Important to understand regional context?
- Competing for Energy Company Obligation spend?



Further improving the data

- Green Deal tool data
- EPC data
  - Gateshead 27,216
  - North Tyneside 27,754
  - Northumberland 43,345
  - Durham 77,090
- Council Tax Benefit/Housing Benefit data
- Geographical and statistical remodelling
- Data protection and licensing issues

Practical use of the data

- Attracting ECO funding into an authority?
- Provision of data directly to Energy Company/Green Deal provider(s)?
- Promoting awareness to residents for self referral to Energy Saving Advisory Service?
- Identifying and promoting area based schemes e.g. district heating?

Thank You for Listening

flynnr@bre.co.uk

Getting a fair deal for home and building owners

A Green Deal Process Tool

Ross Holleron, BRE

29th June 2012

Making Green Deal a mainstream success

- Green Deal is a simple concept that contains complex details

- People need to trust the idea. This requires :-

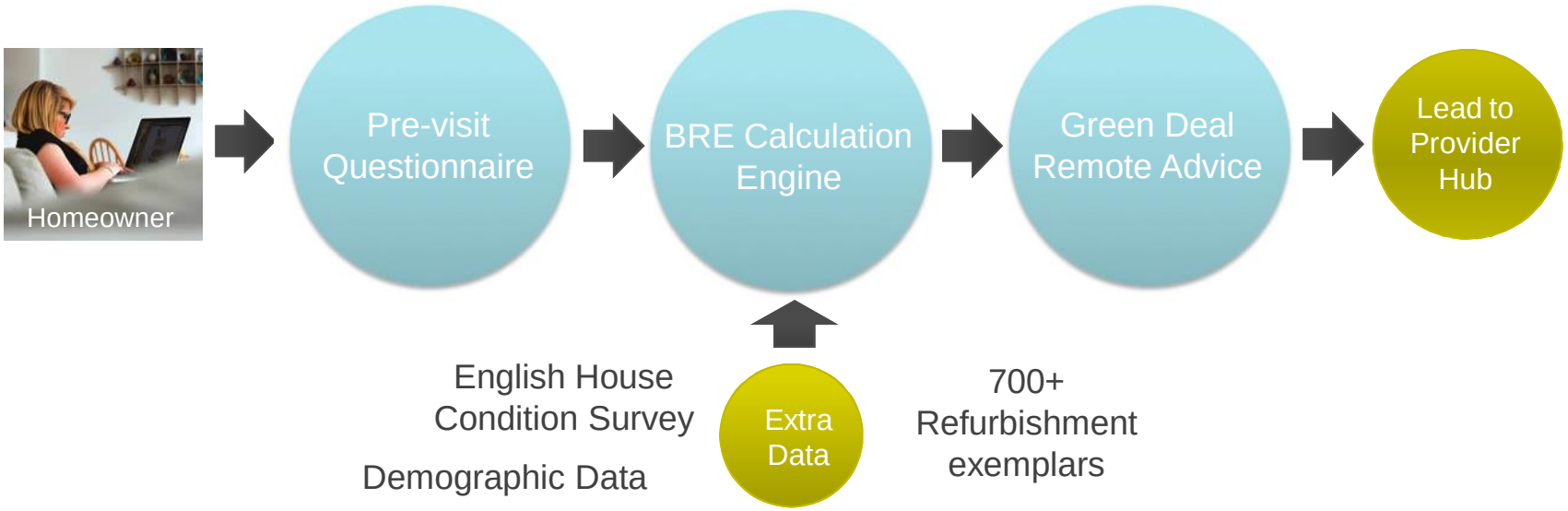
  - **Context** – What savings am I likely to see?
  - **Clarity** – What kind of measures will it involve?
  - **Confidence** – How do I know it is right for me?

- The role of ‘trusted facilitator’ increases our sense of fairness

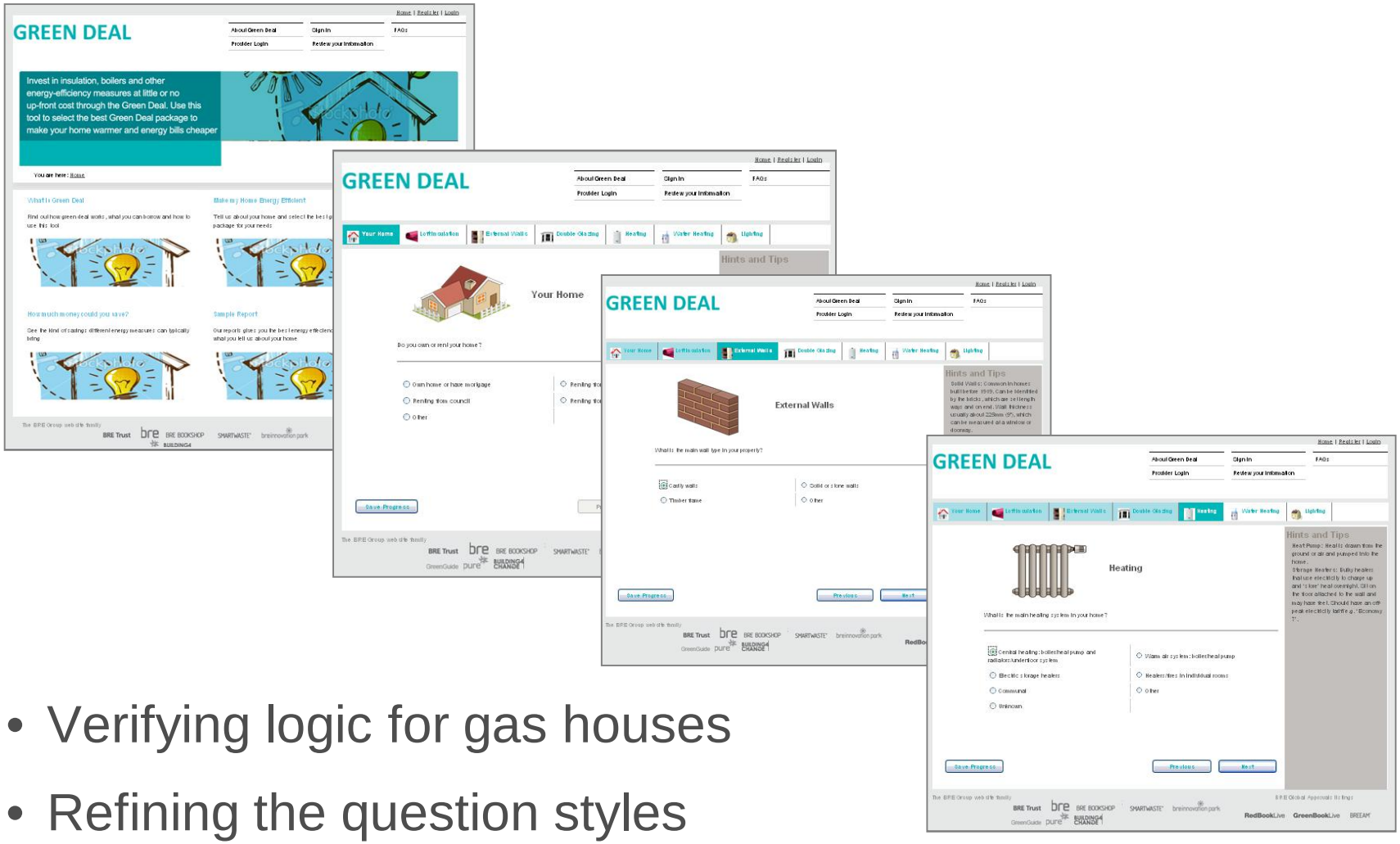
Engagement and process

- **Reducing risk for Providers and the general public**
  - Reassurance around technologies and expectations
  - Better reputation for Green Deal as a whole

- **Reducing abortive survey and administration costs**
  - ‘Pre-informed’ clients = Greater proportion of qualified leads
  - Target surveyors skills = Less risk of non GD applicable buildings



Online pre-assessment testing



- Verifying logic for gas houses
- Refining the question styles

U Switch focus groups

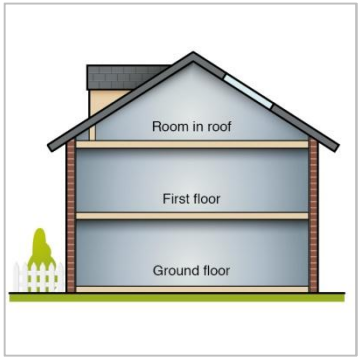
Total sample size (homeowners) = 526

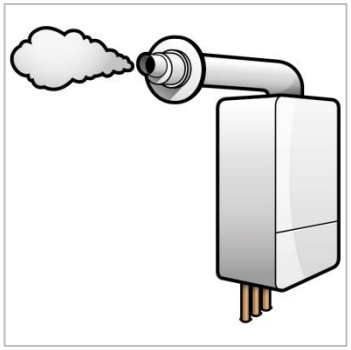
Positives:

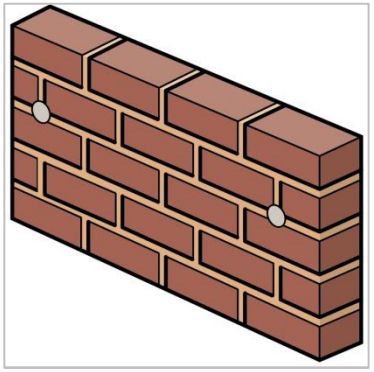
- **Confidence** – most questions had a high confidence rating, e.g. Age of home - 98 % were confident 56% were completely confident
- Most questions were clear and easy to understand
- Pictures and help text frequently used

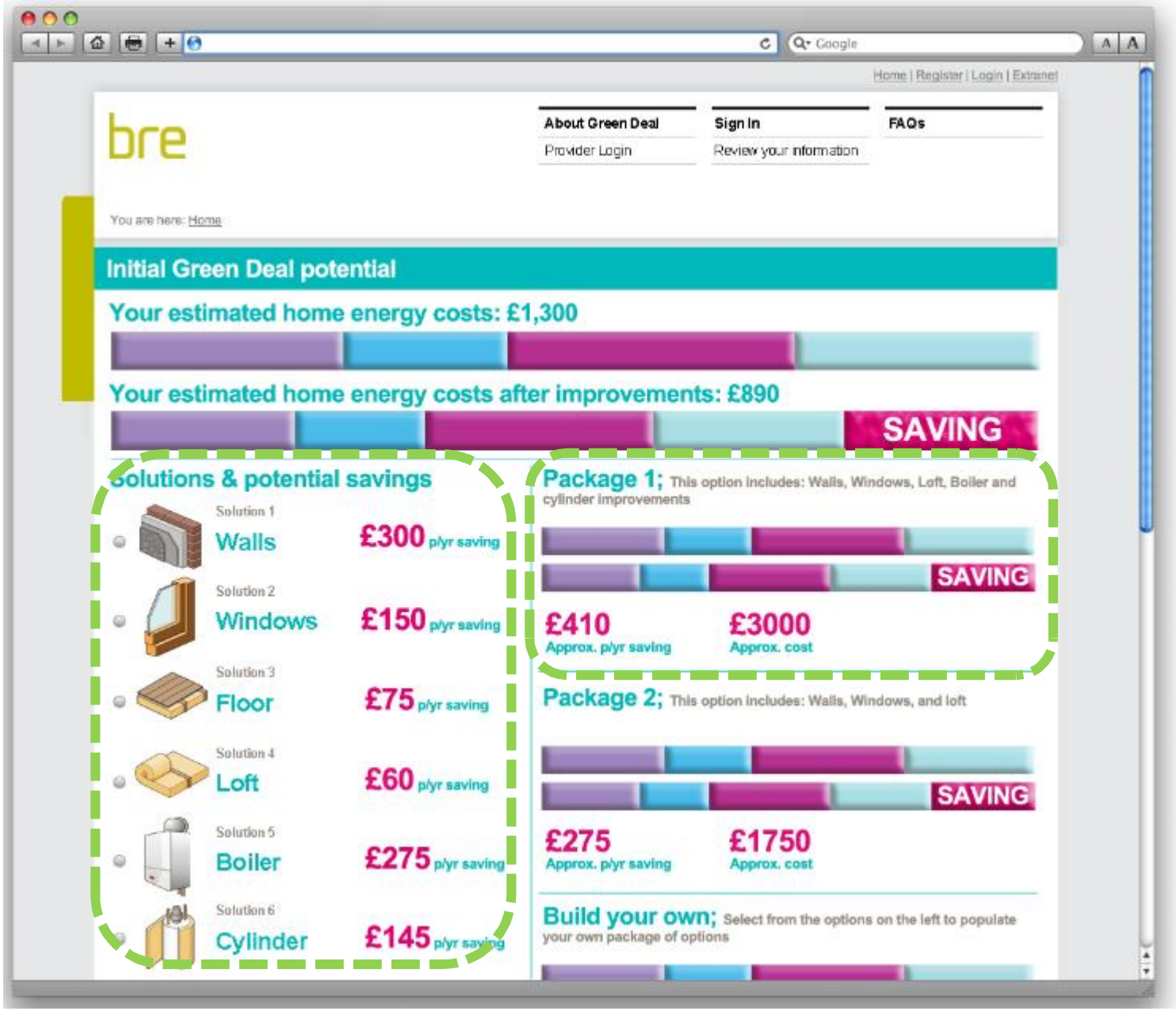
Areas for improvement:

- **Technical details by proxy**
  - Human centric measurements
- Clearer explanation of journey and outputs









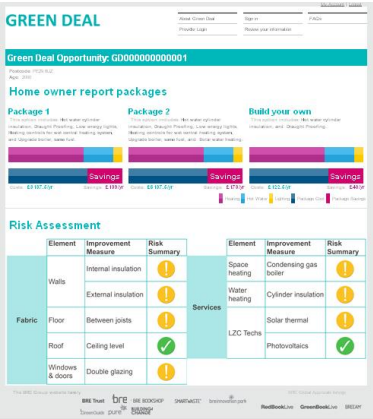
Home Owner overview

Making Green Deal a mainstream success

- People need to trust the idea. This requires :

  - **Context** – Online pre-assessment inc financials
  - **Clarity** – Intelligent pre-visit questioning
  - **Confidence** – Knowledgeable and informed surveyors

- The role of ‘trusted facilitator’ increases our sense of fairness



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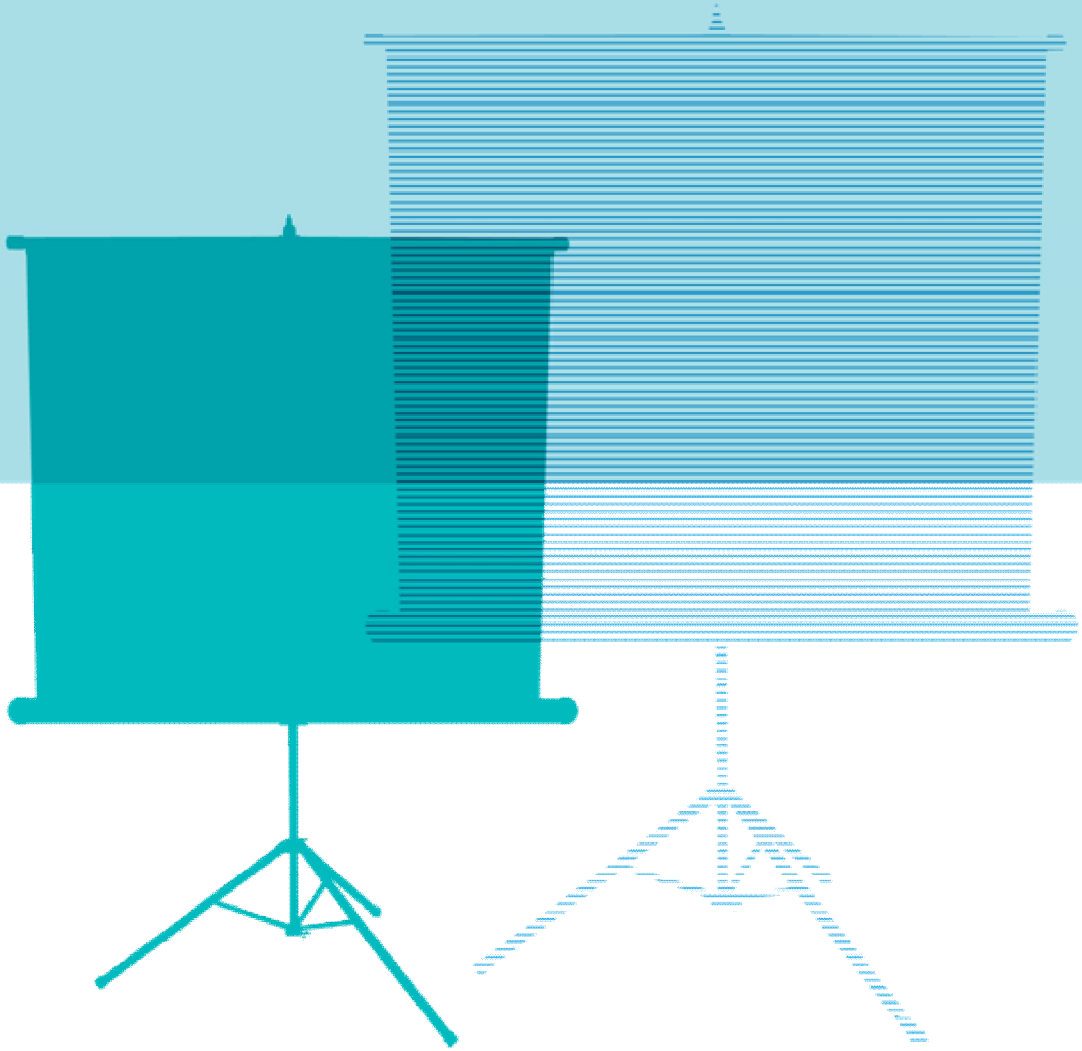


Training for Green Deal

Chris Broadbent
Director, BRE Training

Part of the BRE Trust

Agenda

- Green Deal Advice
- Training and qualifications for Green Deal Advisors
- Certification for Green Deal Advice

Green Deal… one we prepared earlier!

The BRE Victorian Terrace demonstrates the technologies likely under Green Deal now open for viewing.

Green Deal Advice and Advisors

Impartial	Robust	Portable	Qualified/ Certificated
Trusted	Based on EPC	Can shop around	Fit for purpose
Independent generic advice	Fabric	Market offers	Quality qualification
May be tied to provider to offer quote	Improved methodology	Standard process and format	Improved NOS
	Occupancy assessment	Common assumptions	Stronger soft skills
	Consumer redress	Same standard of assessor	More knowledge

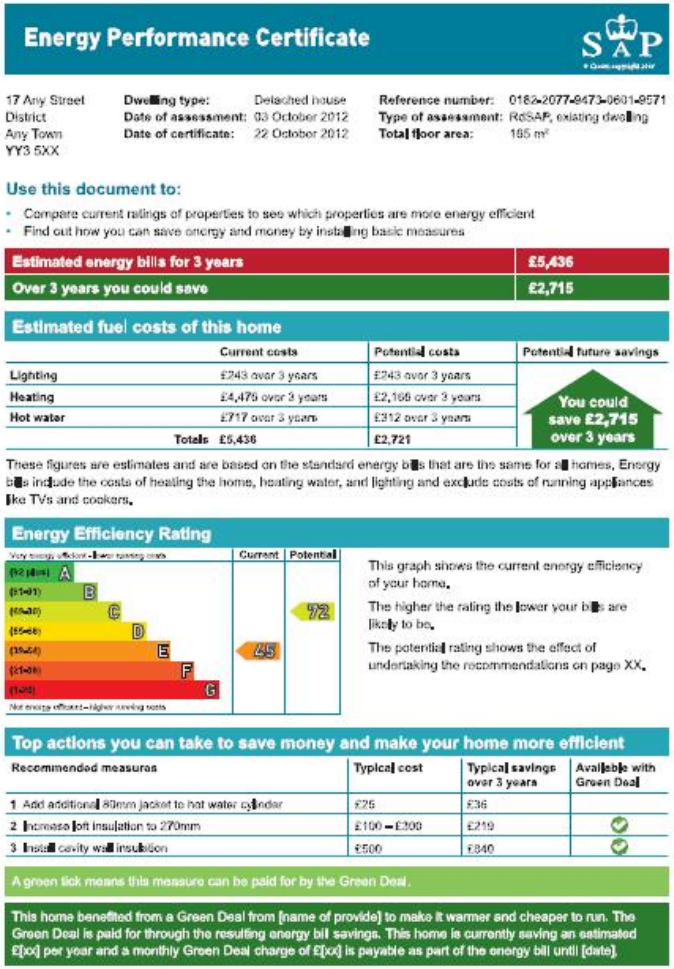
Scope of the Green Deal Advice Report

- The GDAR is made up of:
  - Energy Performance Certificate
  - Occupancy assessment

- A Green Deal Advisor must therefore be able to prepare and lodge an EPC
- The Green Deal plan will be based on the standard occupancy RdSAP calculation for domestic
- The Green Deal plan will be based on the actual (tailored) occupancy for non-domestic
- The full report will be lodged by the advisor

Development of RdSAP for Green Deal

- Recommendations and Golden Rule based on standard occupancy
- Regional weather included (degree days) for cost saving calculations
- Actual U-values where evidence supports
- Additional recommendations included (annually refreshed)
- Additional measures modelled (roof insulation, heat recovery, heat pumps etc..)
- Partial installations, room by room
- Occupancy assessment to show effect of current lifestyle on standard savings
- Green Deal Advice Report = EPC + Occupancy assessment + Summary wrapper
- EPC advisor tool to be expanded in scope



Energy Performance Certificate

17 Any Street
District
Any Town
YY3 5XX

Dwelling type: Detached house
Date of assessment: 03 October 2012
Date of certificate: 22 October 2012

Reference number: 0182-2077-8473-0601-9571
Type of assessment: RdSAP, existing dwelling
Total floor area: 185 m²

Use this document to:

- Compare current ratings of properties to see which properties are more energy efficient
- Find out how you can save energy and money by installing basic measures

Estimated energy bills for 3 years	**£5,436**
Over 3 years you could save	**£2,715**

Estimated fuel costs of this home

	Current costs	Potential costs	Potential future savings
Lighting	£243 over 3 years	£243 over 3 years	You could save £2,715 over 3 years
Heating	£4,475 over 3 years	£2,166 over 3 years	
Hot water	£717 over 3 years	£312 over 3 years	
Totals	£5,436	£2,721	

These figures are estimates and are based on the standard energy bills that are the same for all homes. Energy bills include the costs of heating the home, heating water, and lighting and exclude costs of running appliances like TVs and cookers.

Energy Efficiency Rating

Current: 45 (E)
Potential: 72

This graph shows the current energy efficiency of your home.

The higher the rating the lower your bills are likely to be.

The potential rating shows the effect of undertaking the recommendations on page XX.

Top actions you can take to save money and make your home more efficient

Recommended measures	Typical cost	Typical savings over 3 years	Available with Green Deal
1 Add additional 80mm jacket to hot water cylinder	£25	£36	
2 Increase loft insulation to 270mm	£100 – £300	£219	✓
3 Install cavity wall insulation	£500	£840	✓

A green tick means this measure can be paid for by the Green Deal.

This home benefited from a Green Deal from [name of provide] to make it warmer and cheaper to run. The Green Deal is paid for through the resulting energy bill savings. This home is currently saving an estimated £[xx] per year and a monthly Green Deal charge of £[xx] is payable as part of the energy bill until [date].

Domestic Occupancy Assessment

- Occupancy assessment requires input of:
  - Occupant numbers
  - Number of showers and baths
  - Heating systems, patterns and temperature
  - Freezers and fridges
  - Driers
  - Appliances
- It allows the homeowner to look at the EPC recommendations and select one or more scenarios
- Occupancy tool will then calculate the savings based on standard RdSAP assumptions AND on the given occupancy.
- https://www.gdsap.org.uk

Green Deal Occupancy Assessment

- Improvements
- Typical savings for your type of property
- Savings based on your energy use
- Specific packages of measures
- Information

GREEN DEAL OCCUPANCY ASSESSMENT

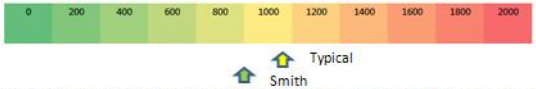
PREPARED FOR : SMITH HOUSEHOLD

ADDRESS: 33, Acacia Avenue, Anytown, XX15 9XX

TYPE OF PROPERTY: Semi-detached

This report shows how your household uses energy currently, and recommends ways of making your home more energy efficient

Current energy bill for the Smith household in £/year



Typical arrows show energy usage for a typical property of this size and type. Smith household energy usage is **LOWER** than typical. See overleaf for how we have worked this out.

Green Deal Improvements available to 33 Acacia Avenue

The Green Deal is a way to improve the energy efficiency of a home without paying to install improvements up front. Providers can only charge repayments that are equal to or less than typical savings for a property like yours.

The amount of money you could save from installing Green Deal improvements depends on how much energy the Smith household currently uses – the higher your bills, the more you could save.

Improvements	Estimated costs*	Smith estimated annual savings	Maximum annual Green Deal repayment**
Increase loft insulation to 270mm	£100 - £350	£45	£47
External or Internal Solid Wall Insulation	£5,500 - £14,500	£350 - £380	£393
New Condensing Boiler	£2,200 – £3,000	£330	£339
Draught proofing	£80 - £120	£25	£26
Total	£7880 - £17970	£750 - £780	£805

Green Deal Improvements chosen by Smith Household

These are the improvements selected for the Smith household

Improvements	Estimated costs*	Smith estimated annual savings	Maximum annual Green Deal repayment**
Increase loft insulation to 270mm	£100 - £350	£45	£47
External or Internal Solid Wall Insulation	£5,500 - £14,500	£340 - £370	£393
Draught proofing	£80 - £120	£20	£26
Total	£5680 - £14,970	£405 - £435	£466

* Discounts available for qualifying homes ** Providers may charge below the maximum level

Your chosen package could save up to £435 per year on your heating and hot water energy bill. Actual savings will depend on how much energy you use and the cost of energy. The maximum a Green Deal provider can charge per year for these improvements is £466. Green Deal repayments would be added to your electricity bill, spread over the year.

iSBEM – what's changing?

- Ability to unlock some standardised assumptions
  - Tailor to building's actual operation
- More convenient means of testing and recording impact of different measures
  - Amend building model to incorporate recommendations
- Means to input actual fuel prices
  - Calculate approximate energy and CO_2 reductions
- Normalising predicted energy use and savings against actual metered consumption

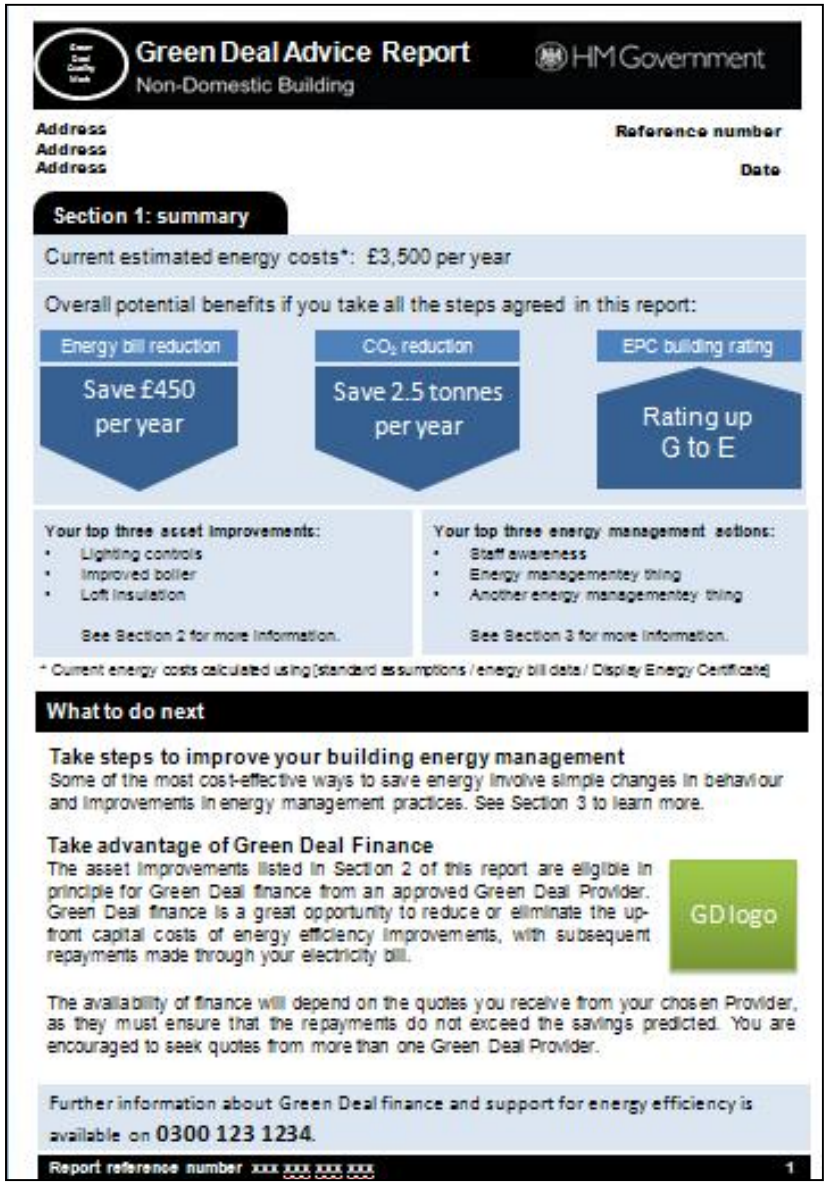
Results

- Building owner and Green Deal Provider have enough information to know:
  - Whether a GD solution could save energy
  - Which sorts of measure would be worth pursuing
  - The scale of likely savings

- Public trial versions of tool:
  - www.gdtool.bre.co.uk

Non-domestic GDAR

- Energy savings
- CO_2 reduction
- Asset improvements
- Steps to improve energy management
- Other issues
- Recommendations



Green Deal Advice Report
Non-Domestic Building

HM Government

Address
Address
Address

Reference number

Date

Section 1: summary

Current estimated energy costs*: £3,500 per year

Overall potential benefits if you take all the steps agreed in this report:

Energy bill reduction	CO_2 reduction	EPC building rating
Save £450 per year	Save 2.5 tonnes per year	Rating up G to E

Your top three asset improvements:

- Lighting controls
- Improved boiler
- Loft insulation

See Section 2 for more information.

Your top three energy management actions:

- Staff awareness
- Energy managementey thing
- Another energy managementey thing

See Section 3 for more information.

* Current energy costs calculated using [standard assumptions / energy bill data / Display Energy Certificate]

What to do next

Take steps to improve your building energy management
Some of the most cost-effective ways to save energy involve simple changes in behaviour and improvements in energy management practices. See Section 3 to learn more.

Take advantage of Green Deal Finance
The asset improvements listed in Section 2 of this report are eligible in principle for Green Deal finance from an approved Green Deal Provider. Green Deal finance is a great opportunity to reduce or eliminate the up-front capital costs of energy efficiency improvements, with subsequent repayments made through your electricity bill.

GD logo

The availability of finance will depend on the quotes you receive from your chosen Provider, as they must ensure that the repayments do not exceed the savings predicted. You are encouraged to seek quotes from more than one Green Deal Provider.

Further information about Green Deal finance and support for energy efficiency is available on 0300 123 1234.

Report reference number xxx xxx xxx xxx 1

Green Deal Advisor Qualification

Part of the BRE Trust

National Occupational Standards

- Revised for Energy Assessment and converted to QCF Units to form part of the new Qualifications and Credit Framework
- New NOS and QCF Units developed for domestic and non-domestic Green Deal

QCF Units: Green Deal Advice

- ASTGDA1: Provide information to customers on the principles, financing and operation of the Green Deal – Level 3-Credit 4
- ASTGDA 2: Undertake home visits to carry out Occupancy Assessments and give advice Level 3 – Credit 8
- ASTGDA 3: Prepare and explain Domestic Green Deal Advice Reports Level 4 Credit 6
- ASTGDA 4: Explain the Green Deal Advice report to the domestic customer Level 3 Credit 4
- ASTGDA 5: Carry out non-domestic energy inspections to determine an Operational Profile and give advice Level 4 – Credit 10
- ASTGDA6: Prepare and issue Non-domestic Green Deal Advice Reports Level 4 – Credit 9
- ASTGDA 7: Explain the Green Deal Advice report to the non-domestic customer level 4–Credit 4

Comparable credits and learning hours

	DEA	DGDA+	NDEA	NDGDA+
Credits	25	22	28/43	27
Guided learning (hrs)	125	110	125/205	135
Private study (hrs)	125	110	155/225	135
Level	3	3	3/4	4

Learning time: a guide to how long it would take the average learner with no prior experience. This will vary according to the existing skill and knowledge of the individual.

Guided Learning Hours (GLH): this refers to the amount of study undertaken by learners under direction. This could include seminars, workshops, directed research, project or assignment work and assessment.

Private Study: other learning and reading around the subject

Assessment of the Qualification

– This is being developed at present by the Awarding Bodies

– This may vary between Awarding Bodies and is likely to include:

Unit	Assessment
ASTGDA1: Provide information to customers	Test plus assignment
ASTGDA 2: Undertake home visits to carry out Occupancy Assessments	Portfolio of evidence
ASTGDA 3: Prepare and explain Domestic Green Deal Advice	Assignment
ASTGDA 4: Explain the Green Deal Advice report to the domestic customer	Assignment

Assignments will include software use, report preparation and role play for advice delivery

Cost

- Top Up Training for Qualified DEAs: £1,495 + VAT
- Green Deal Training for New Entrants: £2,345 + VAT
- GLH similar to DEA for domestic GDA
- GLH similar to L3 NDEA for non-domestic GDA
- HOWEVER both will include one-to-one role play in the assessment and this is expensive to deliver
- Credit tariff outcome will affect the number of days of training and how much can be done on-line

Green Deal related training

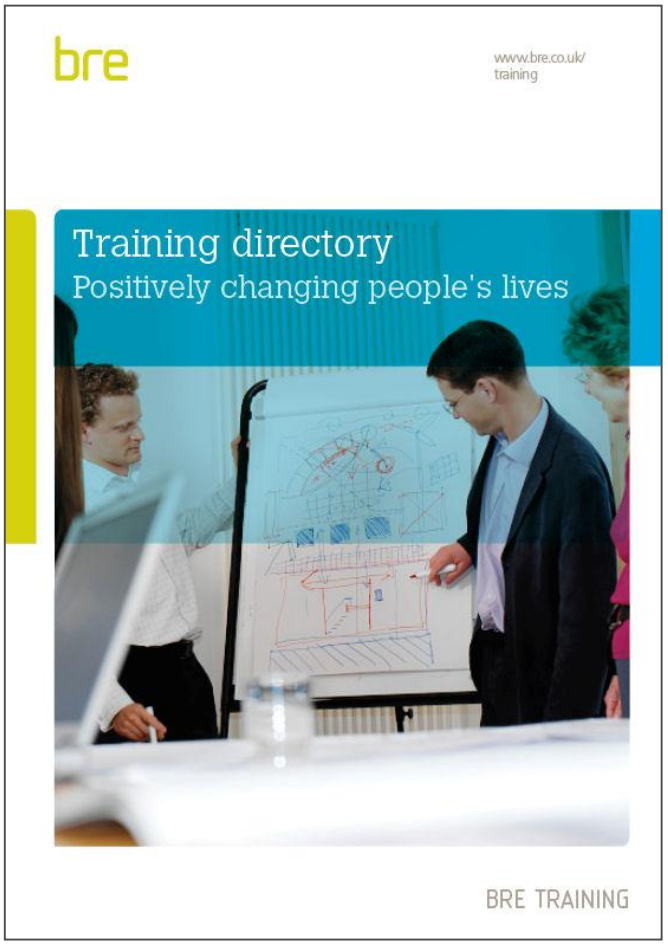
- Remote advice NOS Units
  - Provide information to customers on the principles, financing and operation of the Green Deal
  - Dealing with customers face to face
  - Dealing with customers using bespoke software
  - Using questioning techniques when delivering customer service
  - Dealing with incoming telephone calls with customers

- Apply to:
  - Provider staff
  - Tradesmen
  - Surveyors
  - Storefront staff
  - Helpline staff
  - Behind counter staff
  - Experts in store

- Master-classes for advisors in specific measures

Training

- Approved assessment Centre with ABBE, City & Guilds and Edexcel (BTEC).
- NVQ qualifications for all energy assessor qualifications and more
- A range of other qualifications and CPD in energy, sustainability, health and safety, fire
- On-line, workshop and classroom based delivery
- Already trained:
  - 1,920 in energy assessment
  - 2,000 Code and BREEAM Assessors per year
  - 150 Code designers
  - 160 Passivhaus Designers
  - 300 in Renewable energy technology
  - 100 in Sustainable Refurbishment



BRE unique training offering…

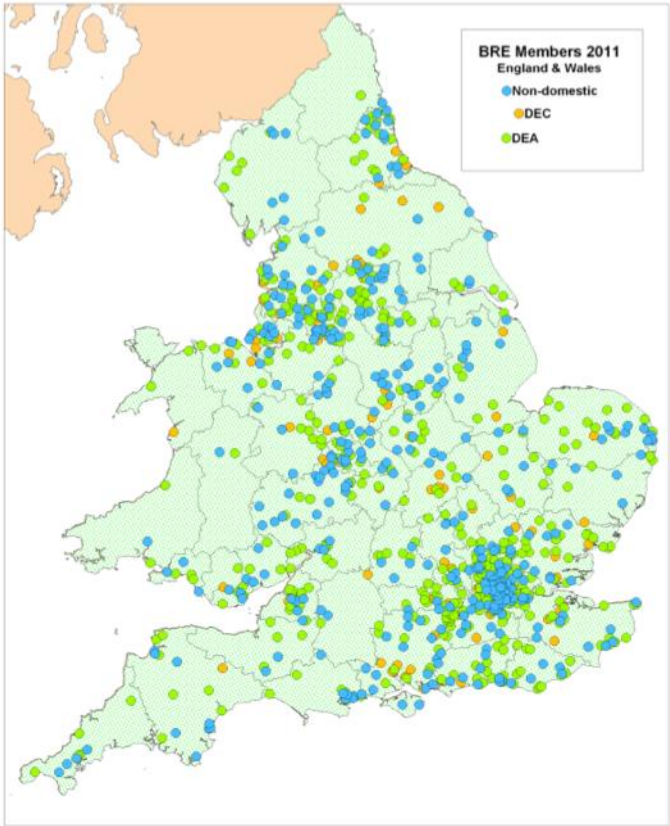
- Access to BRE's 600 consultants and staff
- Extensive onsite facilities
- Supporting all those involved in Green Deal advice with training in:
  - Green Deal Advice
  - Use of BRE Green Deal enhanced modelling software
  - Awareness in Green Deal

Certification of Green Deal Advice

Part of the BRE Trust

Certification with BRE Global

- Assurance of quality for Green Deal Services through high quality scheme controls and Quality Assurance.
- Announced as one of the UKAS accredited Certification Bodies, listing by Gemserv to follow
- Only energy assessor scheme with UKAS accreditation under BS EN 45011
- Operates an MCS scheme automatically acceptable to Green Deal.
- Extensive suite of related certification schemes, including:
  - BREEAM
  - BREEAM in Use
  - BREEAM Refurbishment
  - Passivhaus Designer
  - Code for Sustainable Homes



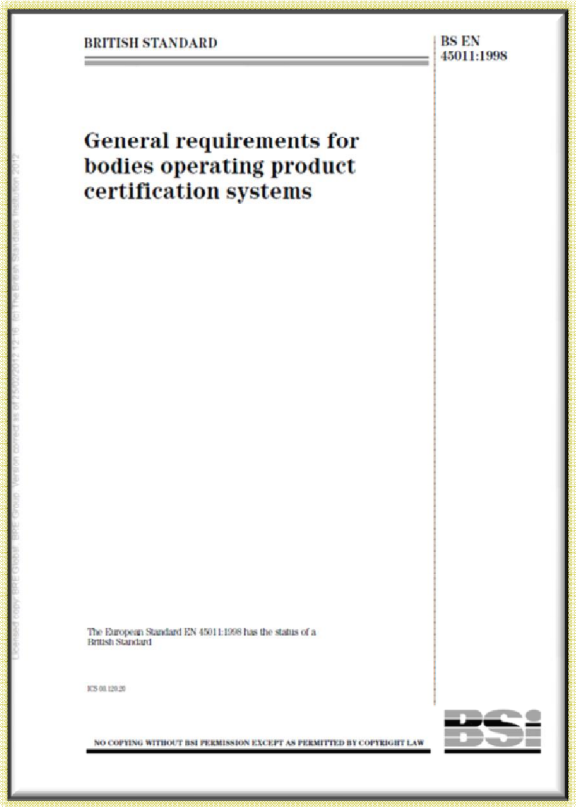
UK distribution of BRE Energy assessors

UKAS and Standards for Certification Bodies

UKAS Accreditation mandated for all Certification Bodies

System of UKAS accreditation against BS EN 45011

UKAS accreditation also against *"Specification for Certification Bodies Certifying the Green Deal Advice Service"*



BRITISH STANDARD

BS EN 45011:1998

General requirements for bodies operating product certification systems

The European Standard EN 45011:1998 has the status of a British Standard

ICS 01.120.20

Scheme Standards

Specification for Certification Bodies certifying the Green Deal Advice Service 201/2012

Specification for **organisations** providing the Green Deal Advice Services 001/2012

Any organisation, including Sole Traders and SMEs, providing GDA services must meet all requirements


Specification for Organisations providing the Green Deal Advice Service

Version 002/2012
15/06/2012

Final versions of the Green Deal Advisor Standards were issued 15th June 2012

Overview of Certification Framework

Scheme Owner – DECC

Green Deal Oversight Body (Gemserv) manages standards on behalf of Government

Scheme Accreditation – UKAS

UKAS accreditation against BS EN 45011 and the Green Deal standards

Accredited Certification Bodies

BRE Global

Certification Bodies certificate organisations (whether sole traders or larger) against the Standard for Organisations providing the Green Deal Advice service

Green Deal Organisations

Organisations certificated by Certification Bodies provide Green Deal Advisor services to market

Green Deal Advisors

Operating under Green Deal Organisations GDAs deliver Green Deal Assessments

Quality Management System (QMS) requirements

Organisations must operate a "Robust and Credible

Management System (QMS)
ISO 9001 registration ***not*** required

Key requirements of the Green Deal Advisor scheme:

- **Insurance** Domestic PI £100K, PL £1m, Non Domestic indemnity cover must be proportionate to the risk but not less than £250K
- **Complaints management procedures**
- **Disciplinary and Appeals procedures**
- **CPD** – requirement that organisations control CPD for their Green Deal Advisors (GDAs)
- **Sub-contracting Green Deal Advice work** – organisations must control sub-contract process
- **Auditing** of Green Deal Advisors and Green Deal Advisory Reports
- **Data protection** – organisations must be registered with the Public Register of Data Controllers by notifying the Information Commissioners Office (ICO)

Key requirements of the Green Deal Advisor scheme:

- **Operational procedures** – must be applied to control GDA activities, including;
- Preparation for assessments
- Information provided to (and requested from) customers prior to a Green Deal Assessment visit
- Requirements during the assessment
- Checking EPC validity and suitability for the Green Deal assessment
- Follow up post Green Deal Assessment, including obtaining customer sign off sheet
- Lodgement of Green Deal Advice Reports
- Production of new EPC following installation of Green Deal measures

The Certification process summarised

Application

Completion of application form and submission of QMS to scheme

Review

Scheme conducts initial cursory review of documentation and provides feedback

Initial Assessment

Assessment of QMS via site visit or by off-site meeting

Review of Green Deal Advisor schedule

Certification Decision

Applicant is advised of outcome of assessment

Maintenance requirements

Witnessed assessment of GDAs within first 6 months

Annual review of QMS

Desk top auditing of 2% of GDARs

Certification renewal

Full QMS re-assessment every 5 years by undertaking site visit

Green Deal Advisor Organisation – BRE Certificate

bre

Certificate of Approval

Certificate Number: 1234 Issue: 01

Having complied with the requirements of

Scheme Document SD201
Specification for organisations providing the
Green Deal Advice Service (version 001/2012)

the Green Deal Advisors listed in the attached Schedule are authorised to use the BRE Global Certification Mark whilst employed with the following company:

Company Address

Click here to enter company address.

Signed for BRE Global Ltd	Andy Butterfield Associate Director	28 February 2012 Date off this Issue
27 February 2012 Date of First Issue		27 February 2012 Expiry Date

This certificate remains the property of BRE Global Ltd and is issued subject to terms and conditions

To check the validity of this certificate please visit www.greenbooklive,com or contact us.

T: +44 (0)1923 664100 F: +44 (0)1923 664603 E: Enquiries@breglobal.com
BRE Global Ltd., Garston, Watford WD25 9XX.

Draft

bre

Schedule to Certificate No: Enter cert number **Issue:** Issue No.

List of Licensed Green Deal Advisors for Enter Company name

Name	EPBD Scheme Membership Number	Non-Domestic	Level 3	Level 4
		☑	☑	☑
		☑	☑	☑
		☑	☑	☑
		☑	☑	☑
		☑	☑	☑
		☑	☑	☑
		☑	☑	☑
		☑	☑	☑

Name	EPBD Scheme Membership Number	Domestic
		☑
		☑
		☑
		☑
		☑
		☑
		☑
		☑
		☑

In accordance with the scheme requirements, you must notify us of any changes in circumstances so that we can amend the Certification details.

For BRE Global Ltd	Andy Butterfield Associate Director	28/02/2012 Date of this Issue	28/02/2012 Date of First Issue	28/02/2012 Expiry Date

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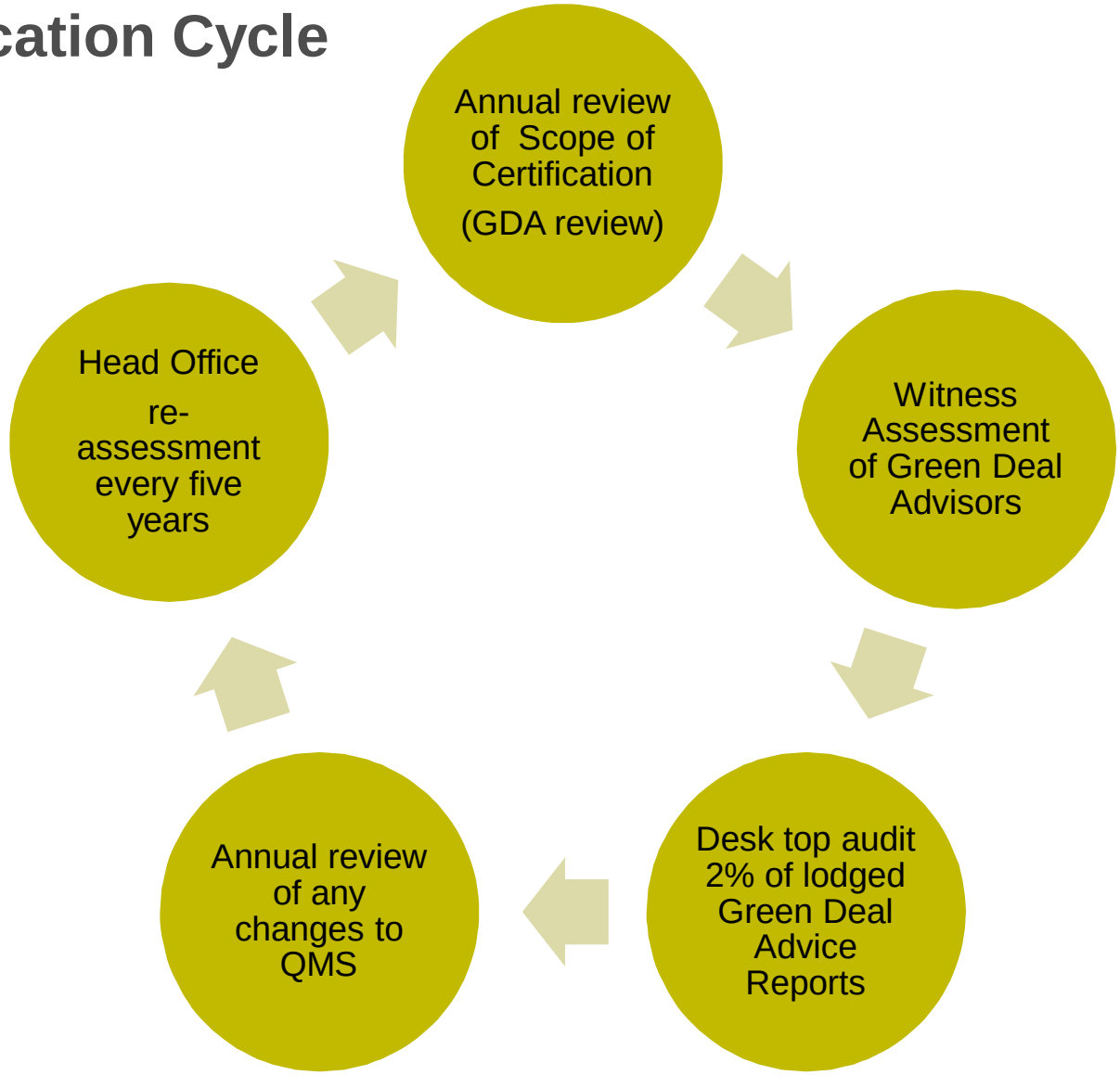
The Certification Cycle



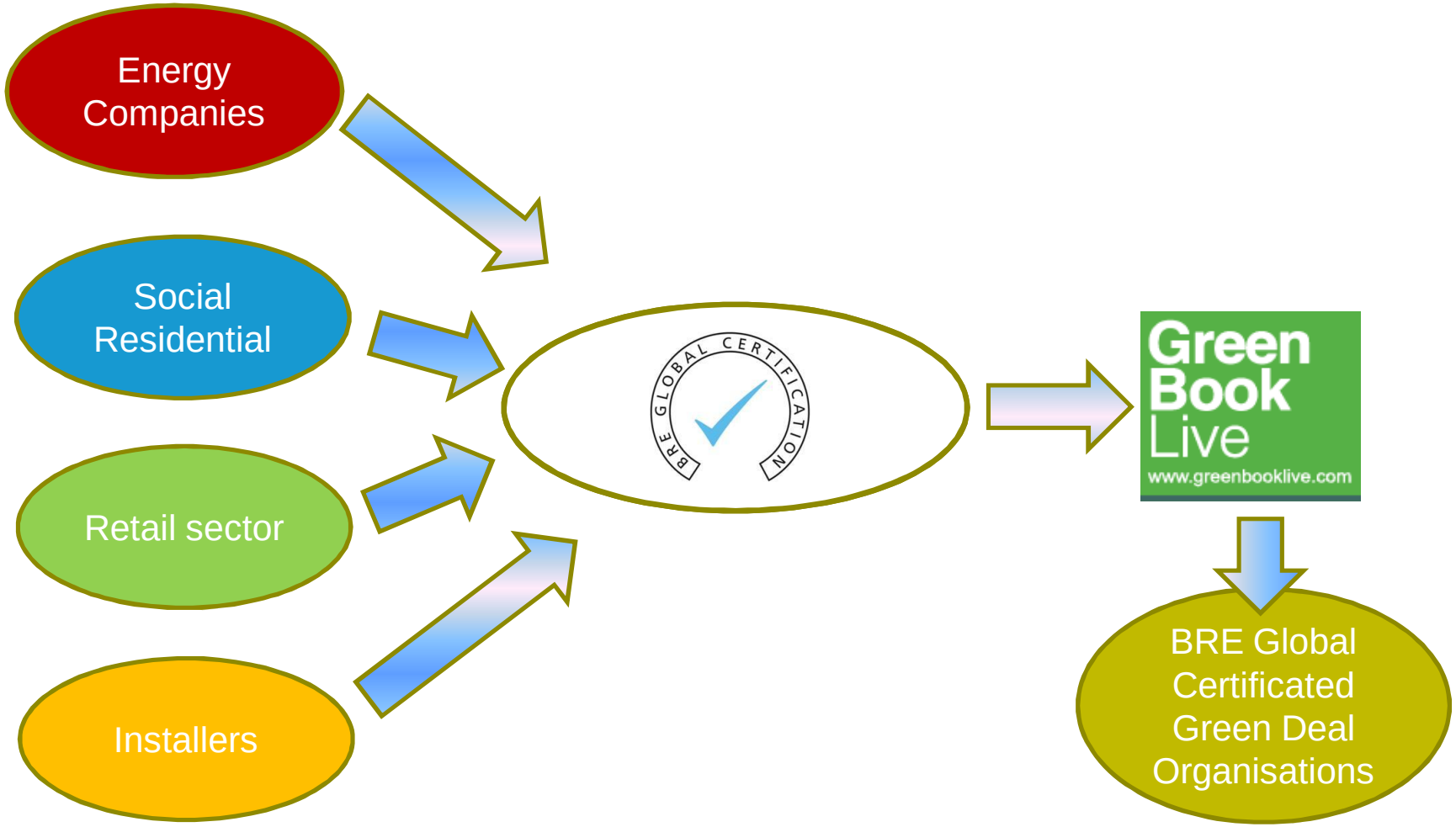
A partnership approach to delivering Green Deal Certification Body Services…

BRE Global & BBA have formed a collaboration to deliver Green Deal Advisor and Installer Certification services

Combined expertise of Certification Bodies to deliver a total solution for Green Deal Organisations

Enabling Green Deal Organisations to provide a comprehensive suite of services to the market

Opportunities and market positioning



BRE Global Green Deal Advisor Certification Scheme

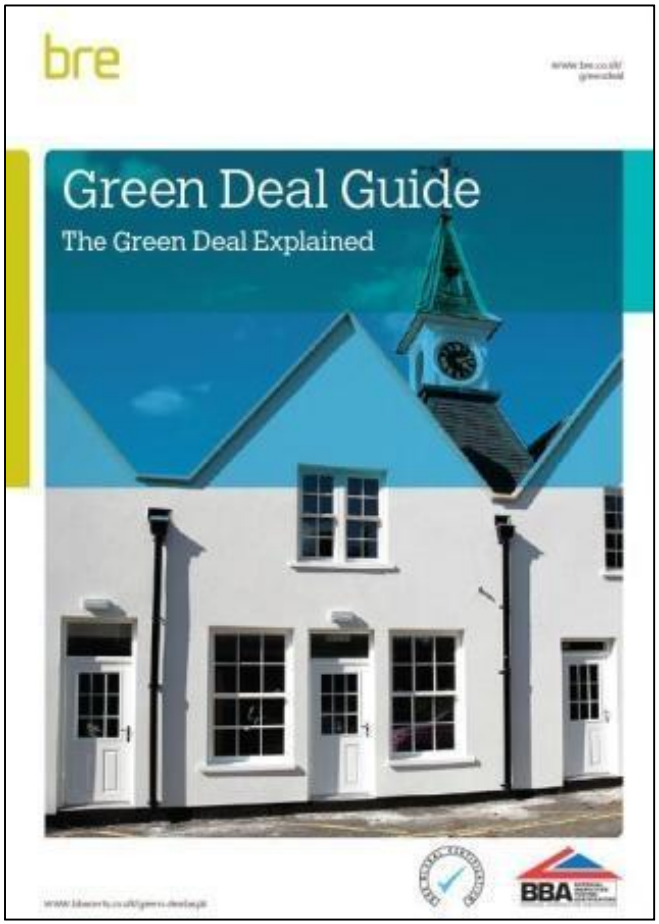
Next steps…

- New BRE web-pages have just been created, on-line application facility available:

  www.bre.co.uk/greendeal
- Following the UKAS announcement applications can now be taken forward
- Green Deal Oversight Body (Gemserv) to list all approved Certification Bodies - August
- Process of initial QMS assessments for early adoptors has already started…

More information…

www.bre.co.uk/greendeal



DEPARTMENT OF ENERGY & CLIMATE CHANGE