Open Homes and Community Energy Efficiency
24 October 2014

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SHAP
sustainable housing action partnership

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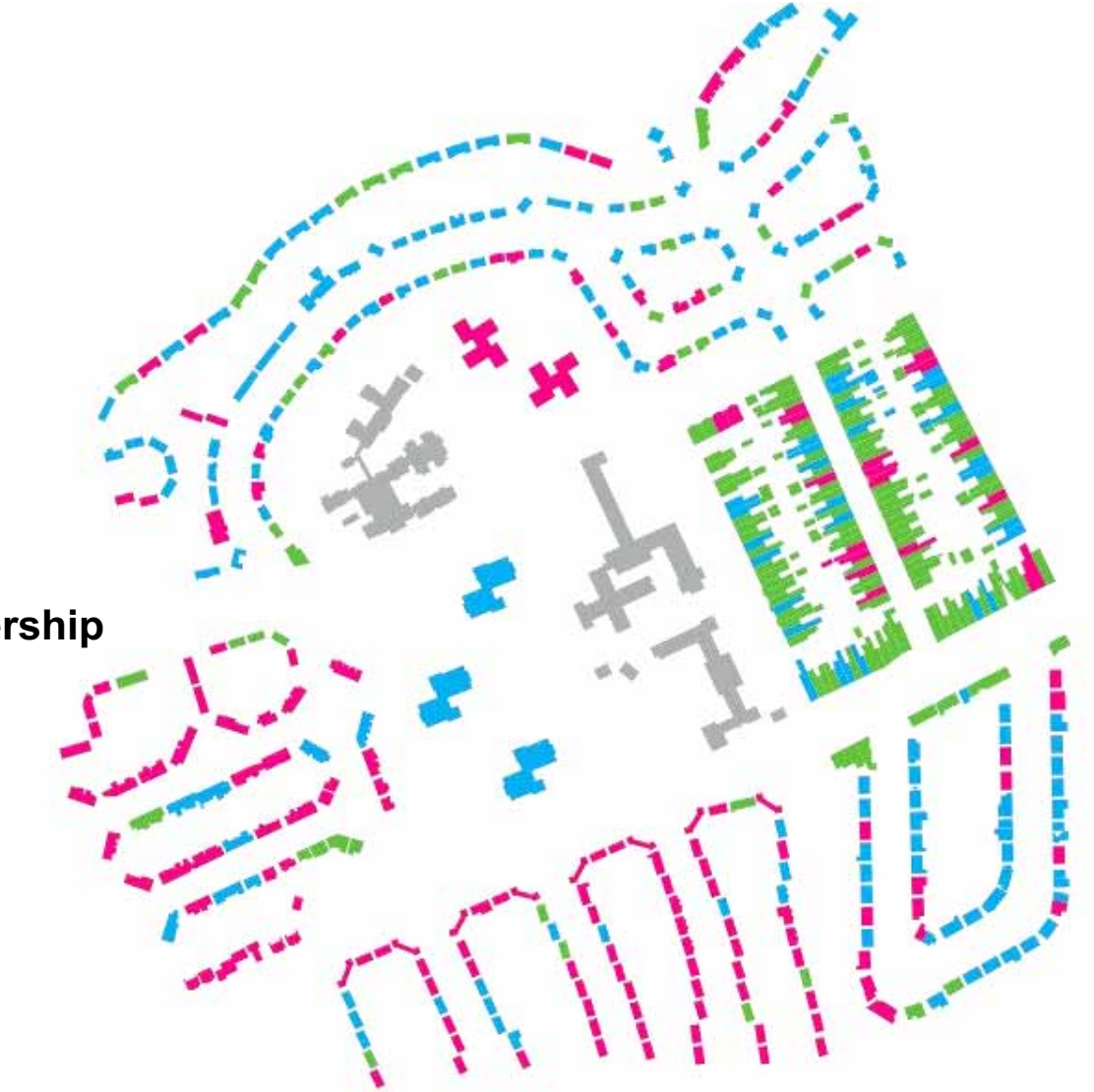


Homes & Communities Agency

Who are we?

- SHAP - established 2005
- Open membership – partners contribute time/sponsorship/expertise
- Supported by a range of Partners
  - Leading Social Housing providers and Local Government
  - Contractors and suppliers
  - Homes & Communities Agency and others
- Developed a range of innovation projects for implementation by the SHAP Partners and the wider housing sector
- Helped the UK Government policy development
- www.shap.uk.com/projects

What do we do?

SHAP
sustainable housing action partnership

Our Vision

1. To provide leadership in Sustainable Housing
2. promoting, researching and disseminating best practice
3. Consider the **Environmental, Social and Economic** aspects of Sustainable Housing.

Community Green Deal

Developing a model to benefit whole communities

"Community Green Deal" report 2010 - a framework for a programme of **whole house retrofit (ENERGY EFFICIENCY) projects – URBED**

THE REPORT IS IN SEVERAL PARTS

1. **THE PROCESS**
2. **THE SUPPLY CHAIN**
3. **THE TECHNOLOGIES – KIT OF PARTS**

Homes & Communities Agency

SHAP sustainable housing action partnership

Community Green Deal

sustainable housing action partnership

3 key PRINCIPLES for a Community Green Deal programme:

1. **large scale** – greater than demonstration
2. **Finance must work**
3. **Economic impact for the local community** - jobs, skills and the supply chain

- http://www.shap.uk.com/projects/shap10/

The Coummunity Green Deal Framework

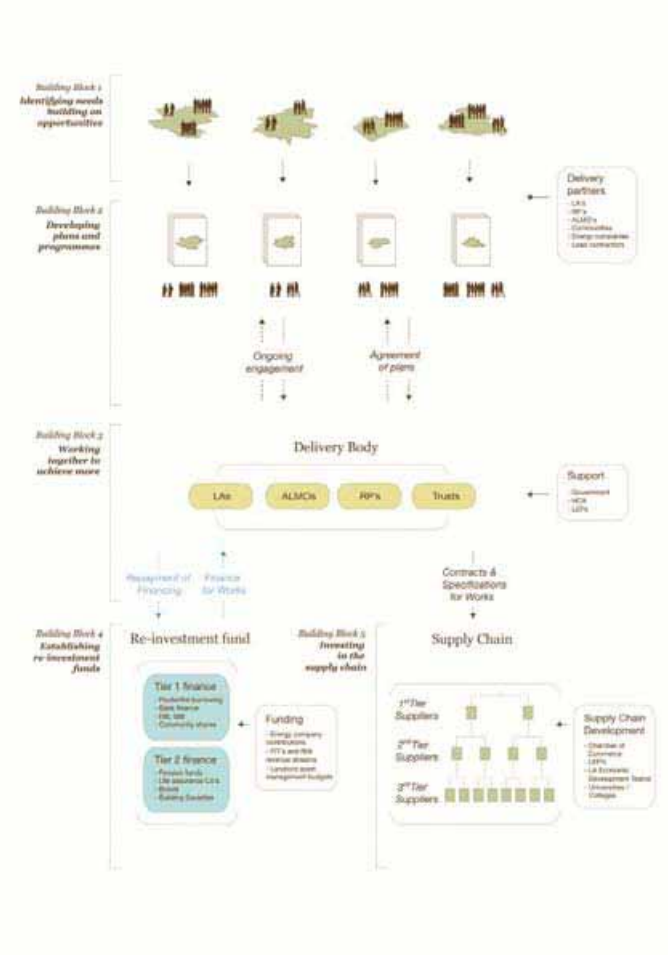
Building Block 1 Needs and Opportunities

Building Block 2 Plans and Programmes

Building Block 3 Partnerships

Building Block 4 Finance

Building Block 5 Supply Chain



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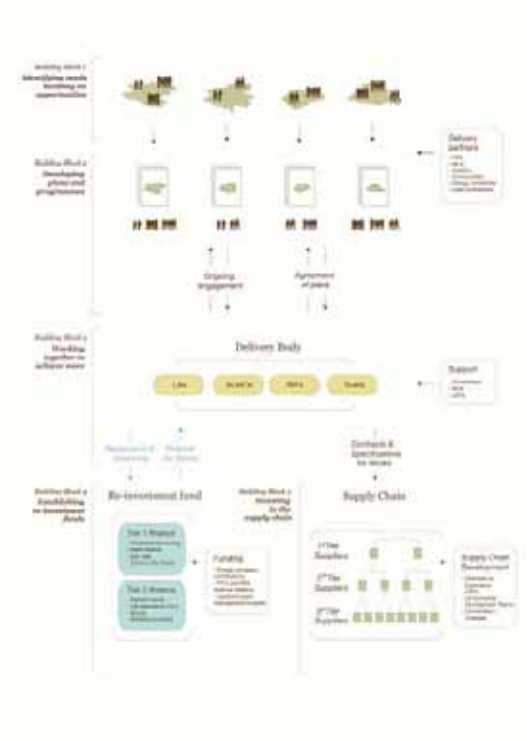
The Coummunity Green Deal Framework - conclusions

To achieve low costs and significant carbon emissions – programmes need to be projects of 3,000 homes in local neighbourhoods



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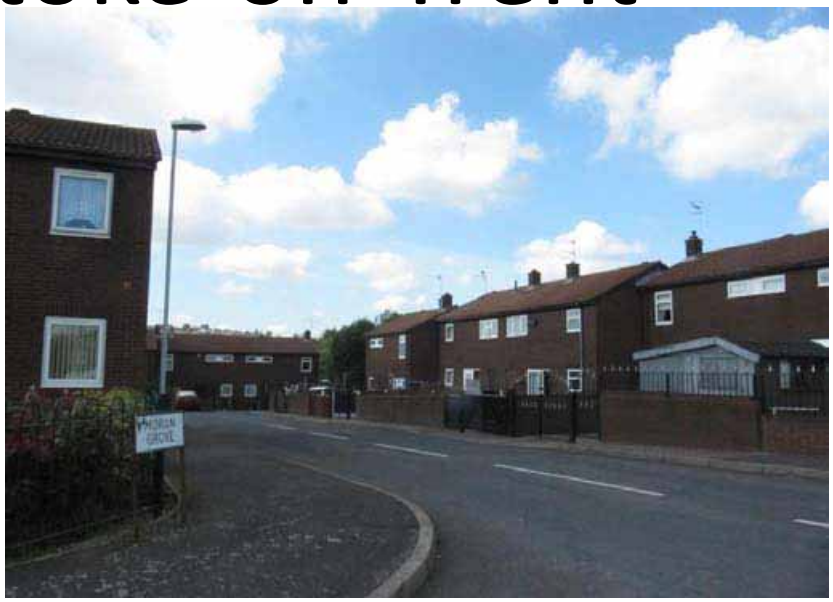
The research looked at :

- Communities
- Housing types
- Potential jobs and skills development

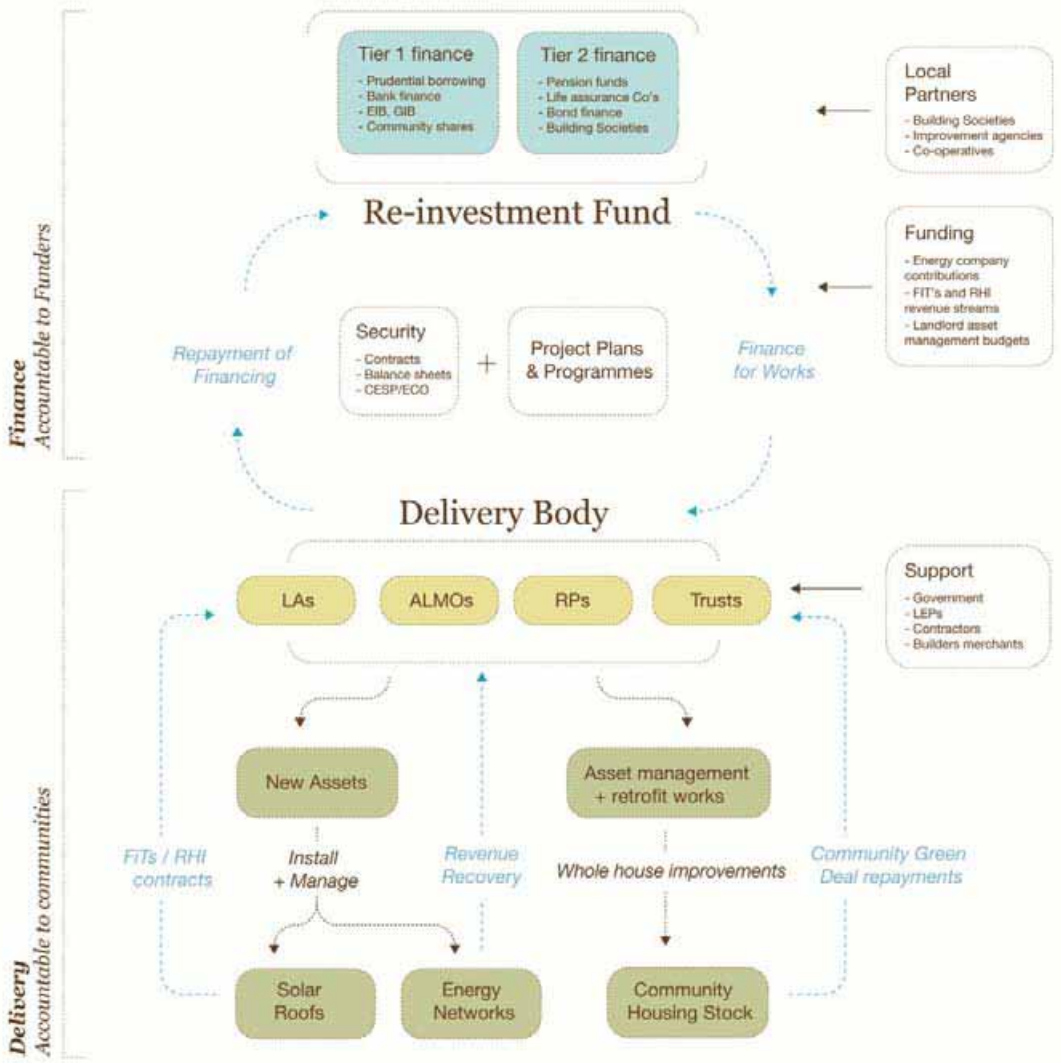
Middleport, Stoke-on-Trent



Northfield, Birmingham

Rural towns, Shropshire

Funding Community Green Deal



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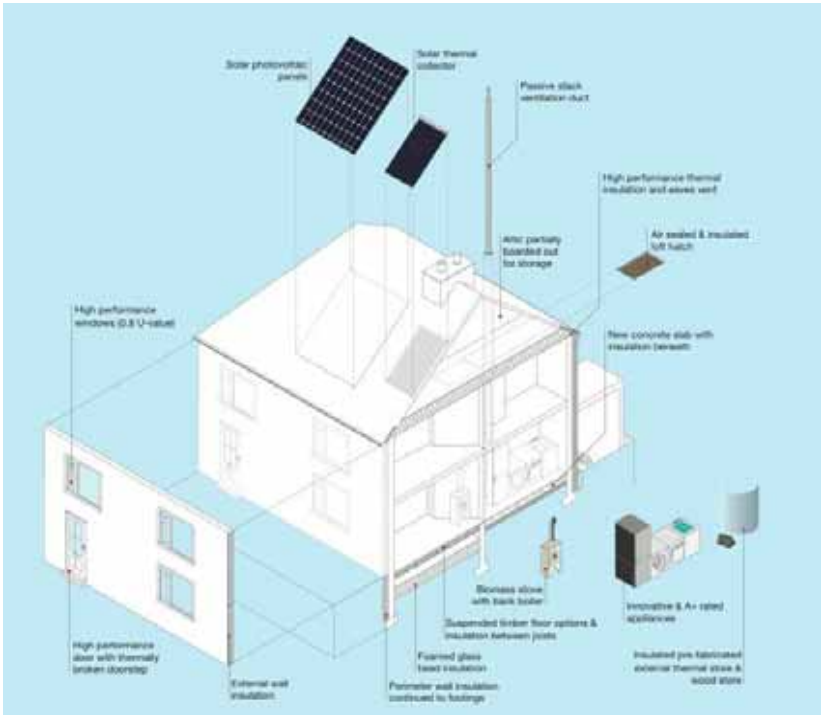
The need for supply chain development - conclusions

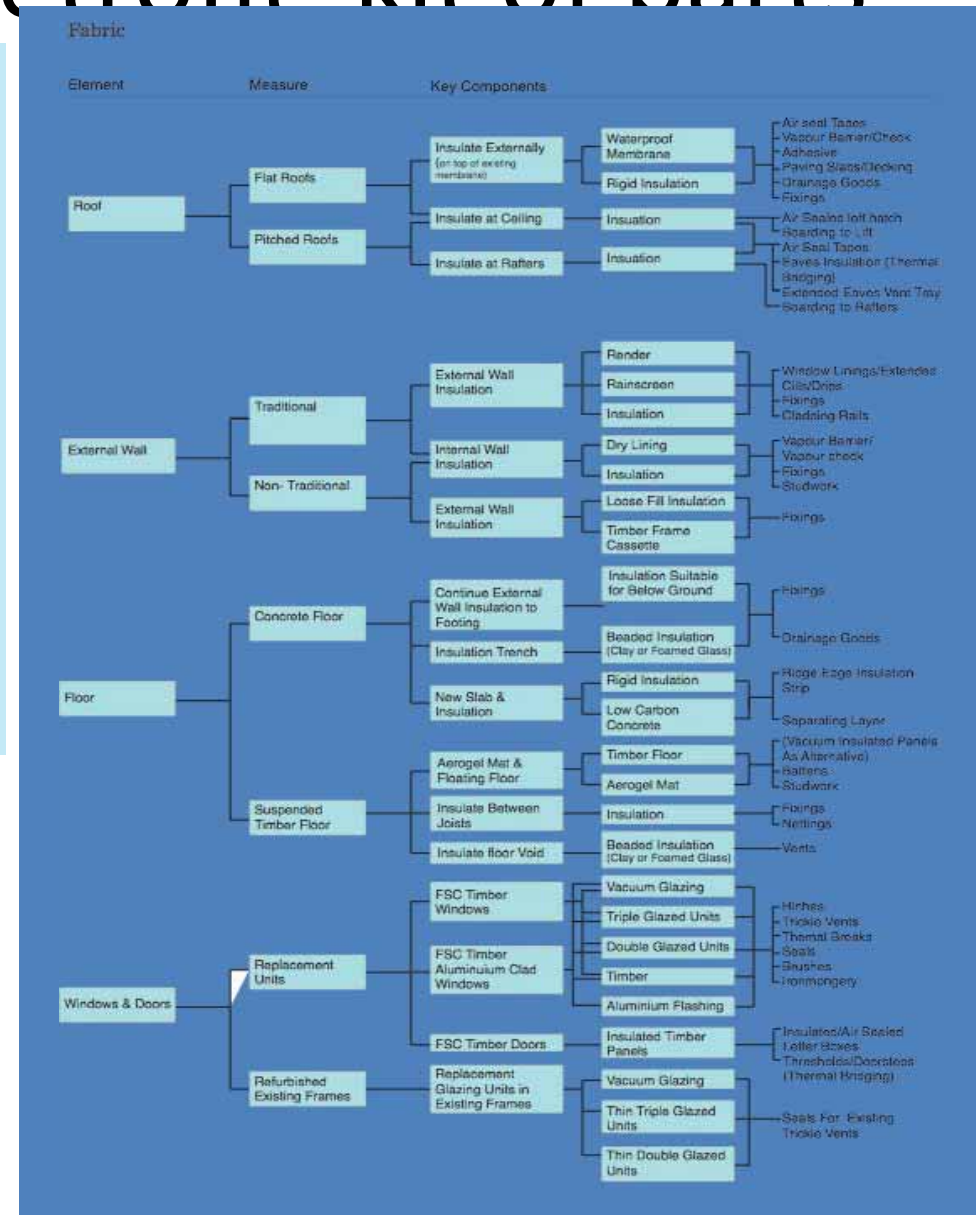
1. A mature supply chain to deliver **large programmes**
2. **The skills** to deliver across the whole supply chain
3. Potential to drive down whole home retrofit **costs**
4. Capture value from market with **£15bn market potential**
5. **Major opportunity for the UK economy**
6. **Diversifying** remaining manufacturing specialisms ie reduce dependency on automotive sector in the West Midlands

Output –
The Companion Guide = “kit of parts”
-

- **Kit of (standard) parts – selection criteria to reduce risk through bulk purchase – toxicity, fabric performance, price, durability, embodied energy etc**

Unpacking the retrofit ‘kit of parts’





The Green Deal

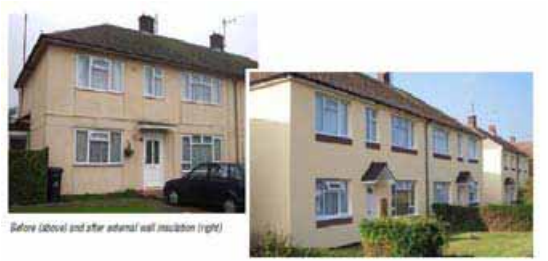
DECC

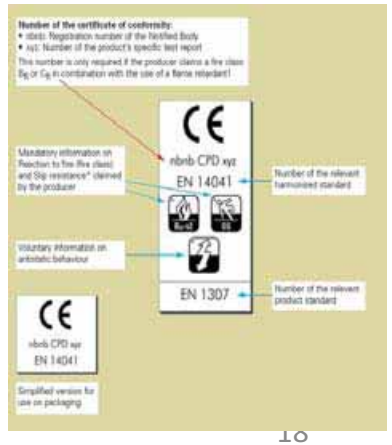
Department for Energy and Climate Change

Practical information for manufacturers and suppliers

There are over 45 types of products which can be used in a Green Deal

- Including insulation, new boilers etc





Measures

Heating, ventilation and air conditioning	Condensing boilers Heating controls Under-floor heating Heat recovery systems Mechanical ventilation (non-domestic) Flue gas recovery devices
Building fabric	Cavity wall insulation Loft insulation Flat roof insulation Internal wall insulation External wall insulation Draught proofing Floor insulation Heating system insulation (cylinder, pipes) Energy efficient glazing and doors
Lighting	Lighting fittings Lighting controls
Water heating	Innovative hot water systems Water efficient taps and showers
Microgeneration	Ground and air source heat pumps Solar thermal Solar PV Biomass boilers Micro-CHP

INTRODUCTION TO CLIMATE-KIC TRANSITION THEORY

Pioneers into Practice
Undertake a paid 1 month UK placement and a paid 1 month European placement

TRANSITION THEORY

Climate KIC Theory
Low Carbon Transition through System Innovation

System Innovations

.....

= **major changes**

when

new technologies /products

+

their use happen at scale

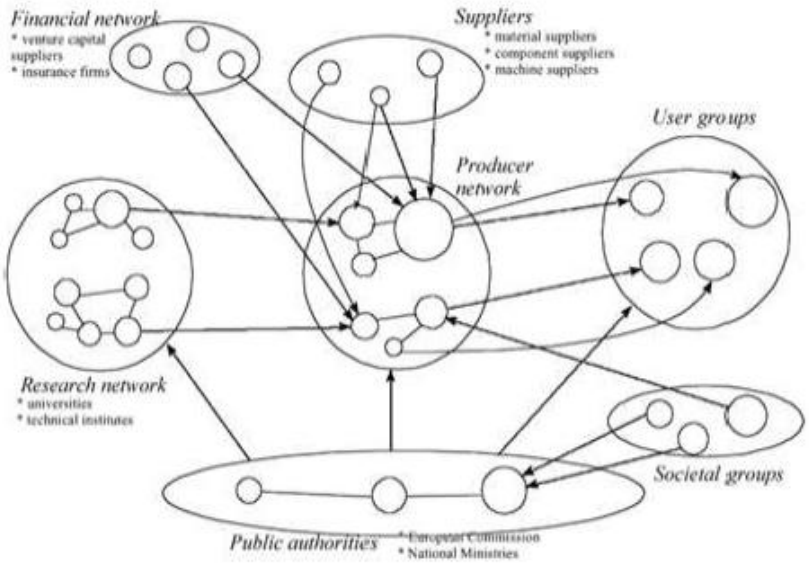
http://www.transitiepraktijk.nl/files/PIP%20Reader%202012%20final(1).pdf

eit Knowledge & Innovation Community Climate-KIC

Climate KIC Transition Theory

TRANSITION THEORY

System Innovations happen because of interaction between **analytical 'levels'** and involve a number of different **'actors' – there are 3 levels of activity in society**



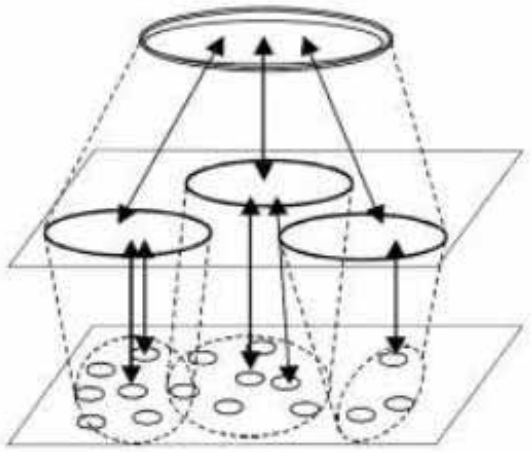


Figure 8. The Multi-Level model

eit Knowledge & Innovation Community
Climate-KIC

HOW LONG DOES TRANSITION TAKE AND WHERE DID IT ALL BEGIN?

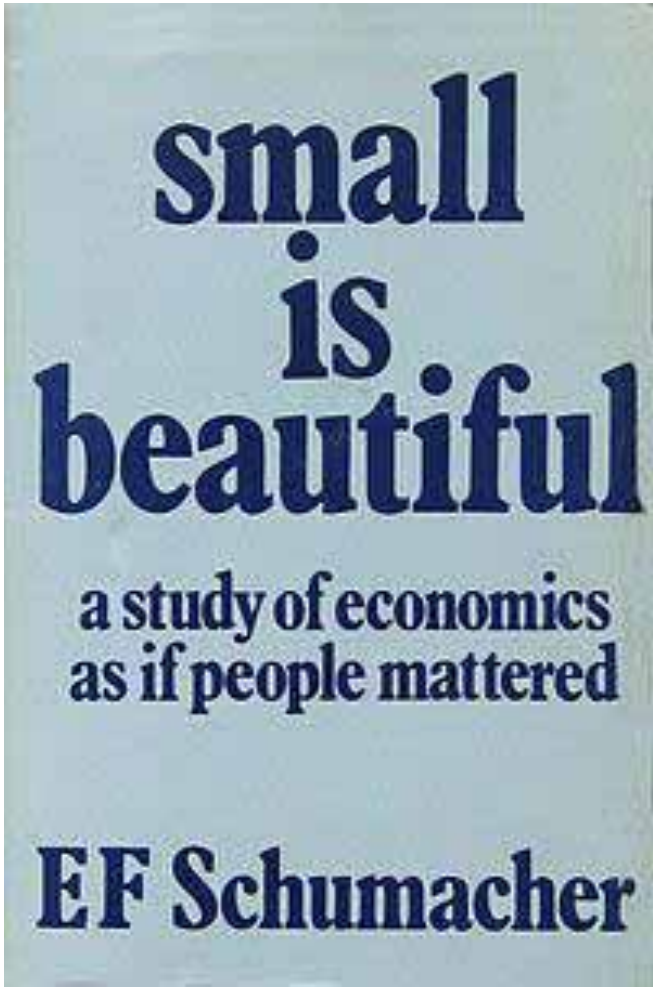
Climate Change in the Bay Area –
What's happening, what's likely to happen,
and how might we respond?

Pamela Matson
Stanford University
School of Earth Sciences
& The Woods Institute for
the Environment
and
Susanne Moser
Stanford University

Fifty years ago (**1962), Rachel Carson published *Silent Spring***, about the environmental dangers of widespread, unregulated pesticide use. This is believed to be the beginning of the environmental movement.

"...we have brought into being a fateful and destructive power."

-- Rachel Carson © 1962



First published in **1973,** ***Small Is Beautiful*** brought **E F Schumacher**'s critiques of Western economics to a wider audience during the 1973 energy crisis and emergence of globalisation. The Times Literary Supplement ranked *Small Is Beautiful* among the 100 most influential books published since World War II.

The **United Nations Conference on Environment and Development** (UNCED), also known as the **Rio Summit, Rio Conference, Earth Summit** was a major UN conference 3 – 14 June1992.

The Earth Summit resulted in:

2 important legally binding agreements were opened for signature:

Convention on Biological Diversity

Framework Convention on Climate Change (UNFCCC)

Rio Declaration on Environment and Development

Forest Principles

Agenda 21

Kyoto Protocol 1997 – formal agreement on limiting greenhouse gas emissions – **came into force in 2005.**

Kyoto Protocol participation map 2010.

Green = countries that have ratified the treaty

Dark green = Annex I and II countries that have ratified the treaty

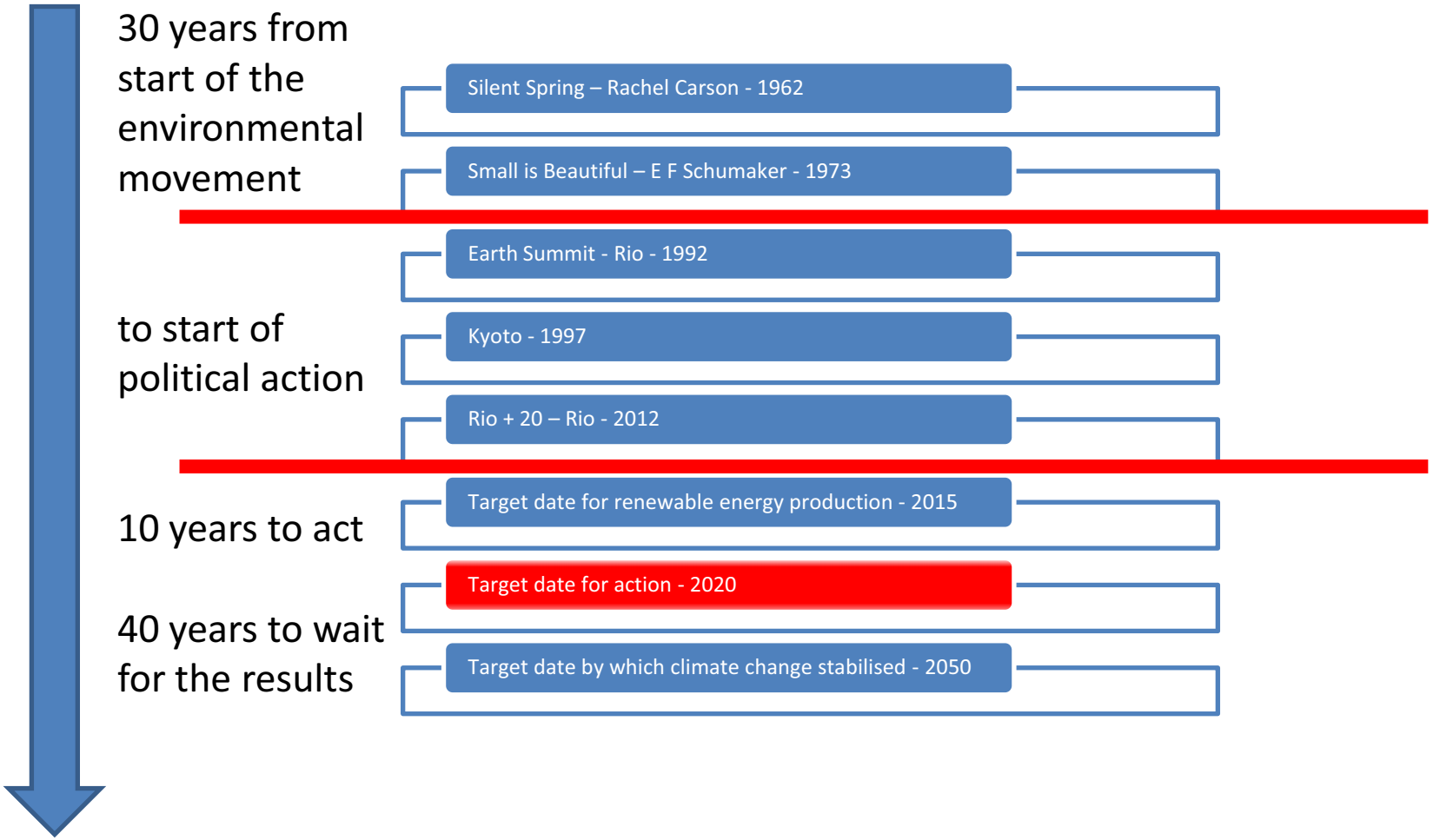
Grey=not yet decided

Brown= will not ratify

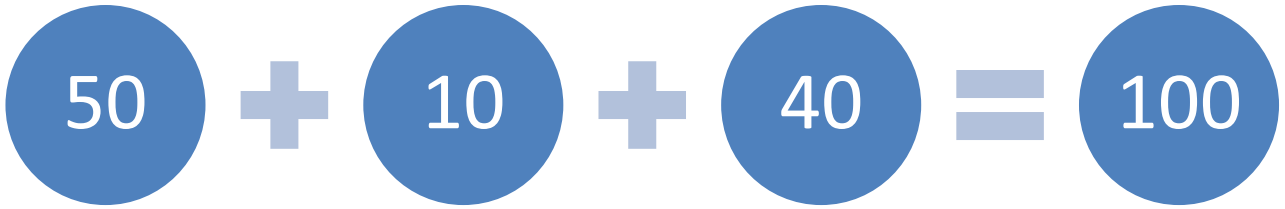
Red = Canada, which announced its intention to withdraw in Dec 2011

In June 2012, the **United Nations Conference on Sustainable Development** was also held in Rio, and is also commonly called **Rio+20 or Rio Earth Summit 2012.**

10 YEARS TO SAVE THE WORLD!



Transition Theory => ‘landscape’ change takes 2 generations = 50 years => now is the time to act



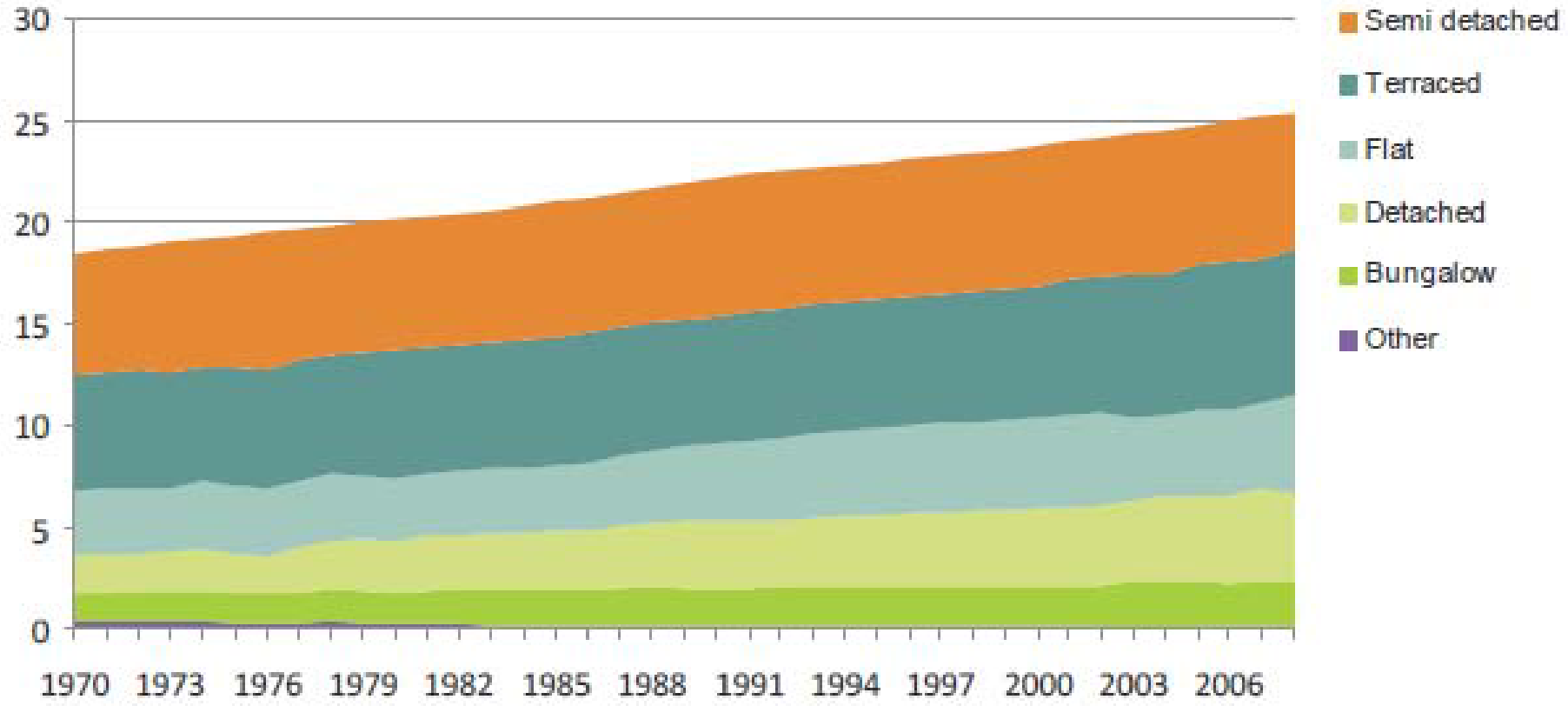
Environmental movement started 50 years ago

Rio 2020 target for change is in 10 years

We need to act now so that climate change is stabilised in 2050 = 40 years in the future

26 million homes in the UK …..

75% will still exist in 2050

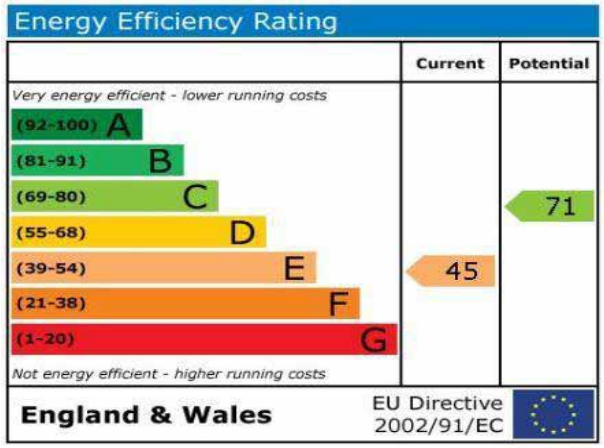


Graph 4c: Housing stock distribution by type (millions)

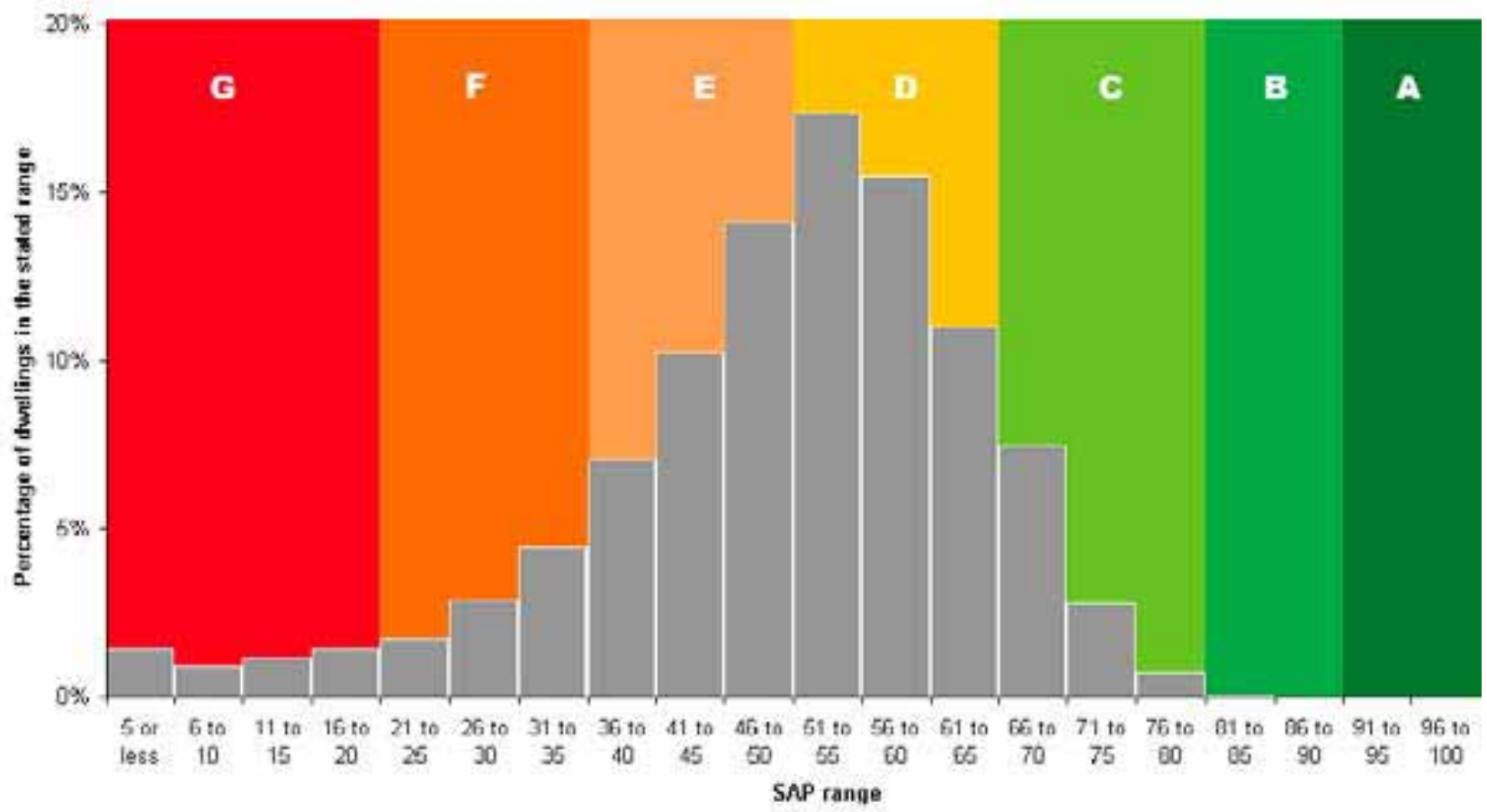
UK HOUSING STOCK – very mixed construction

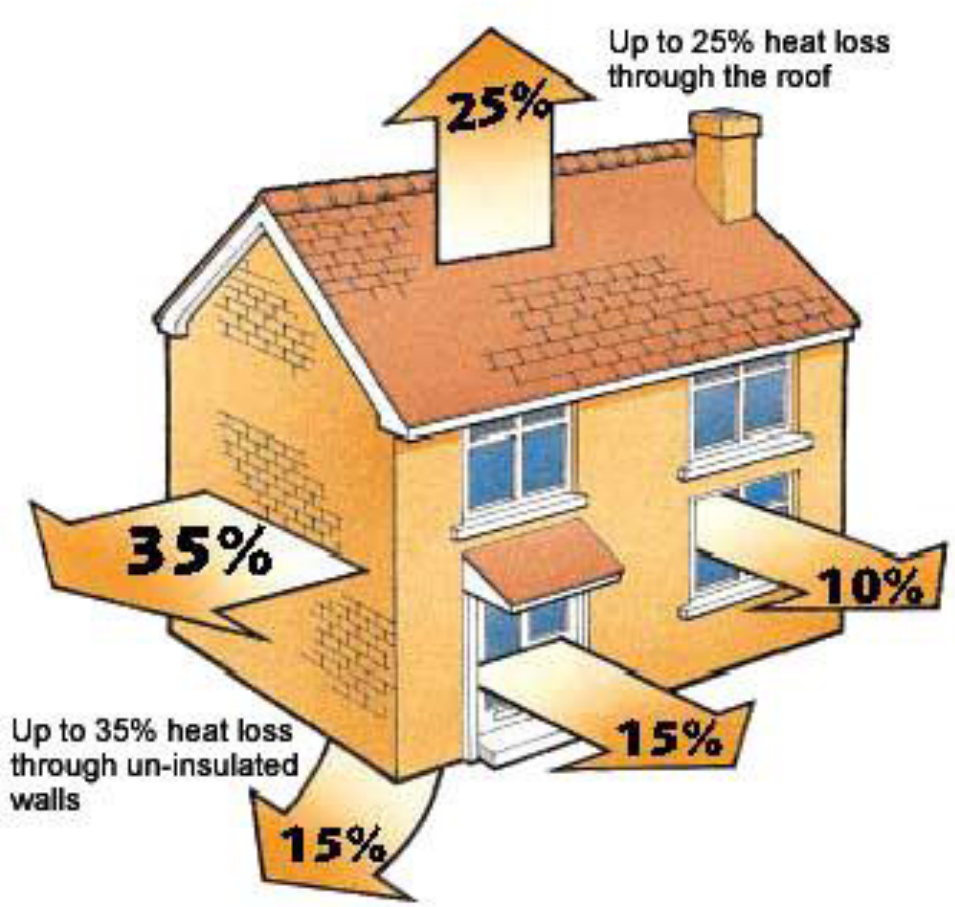
Moving the housing stock to ‘A’

This house has been insulated

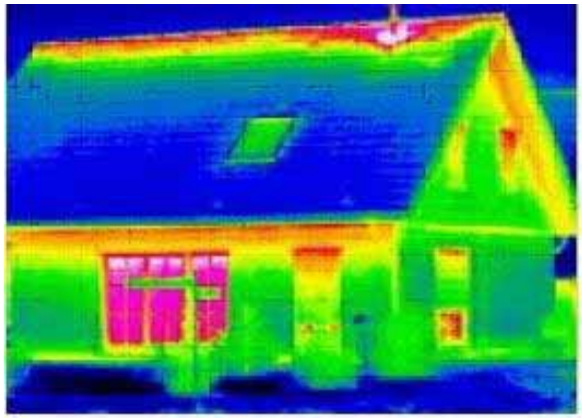


Indicative Energy Performance Certificate profile of the UK housing stock





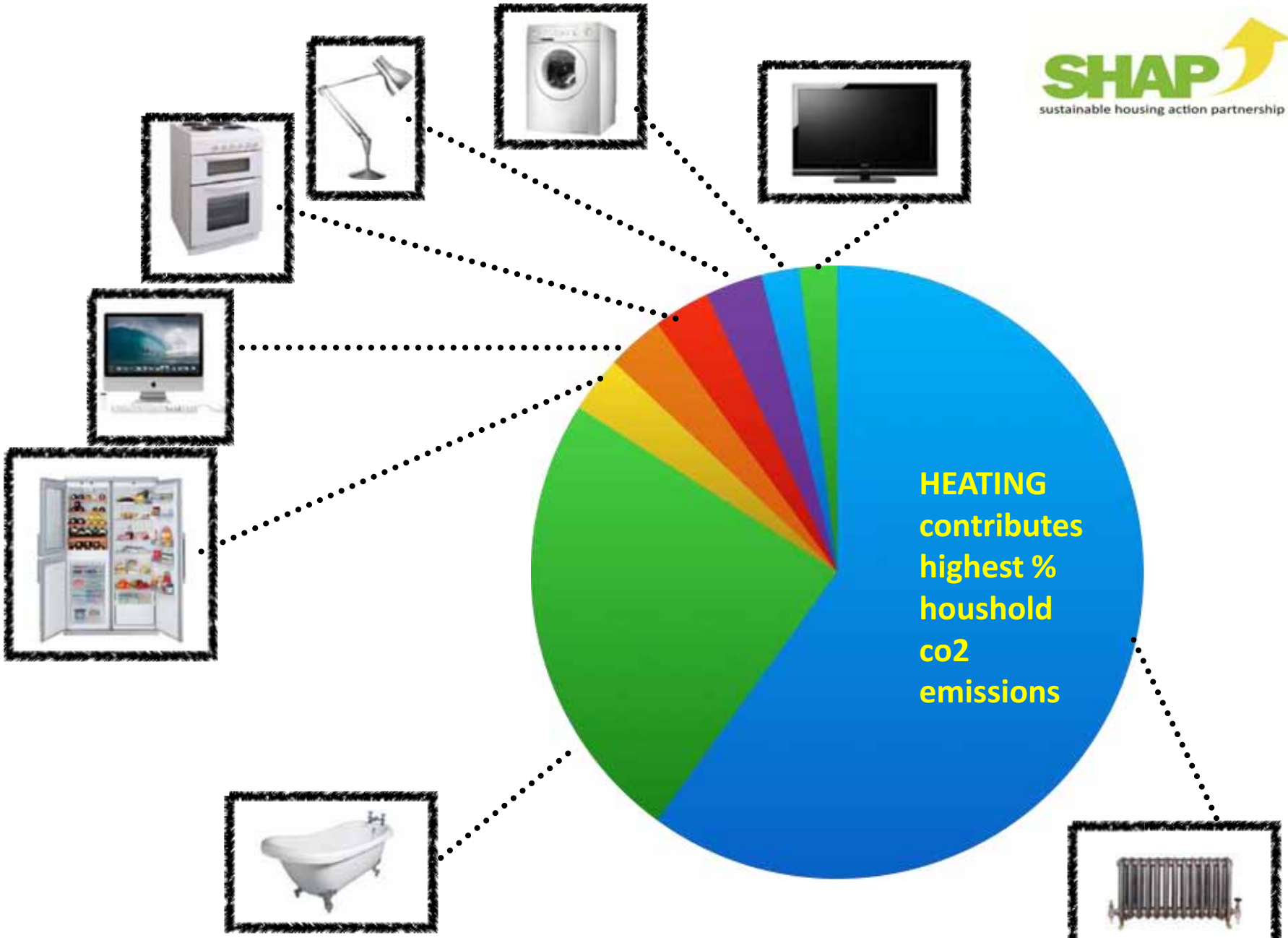
13,400 homes a week need urgent energy efficiency work



Infrared Thermal Image

Where do houses lose heat?

Now the UK Government wants all buildings to be very well insulated



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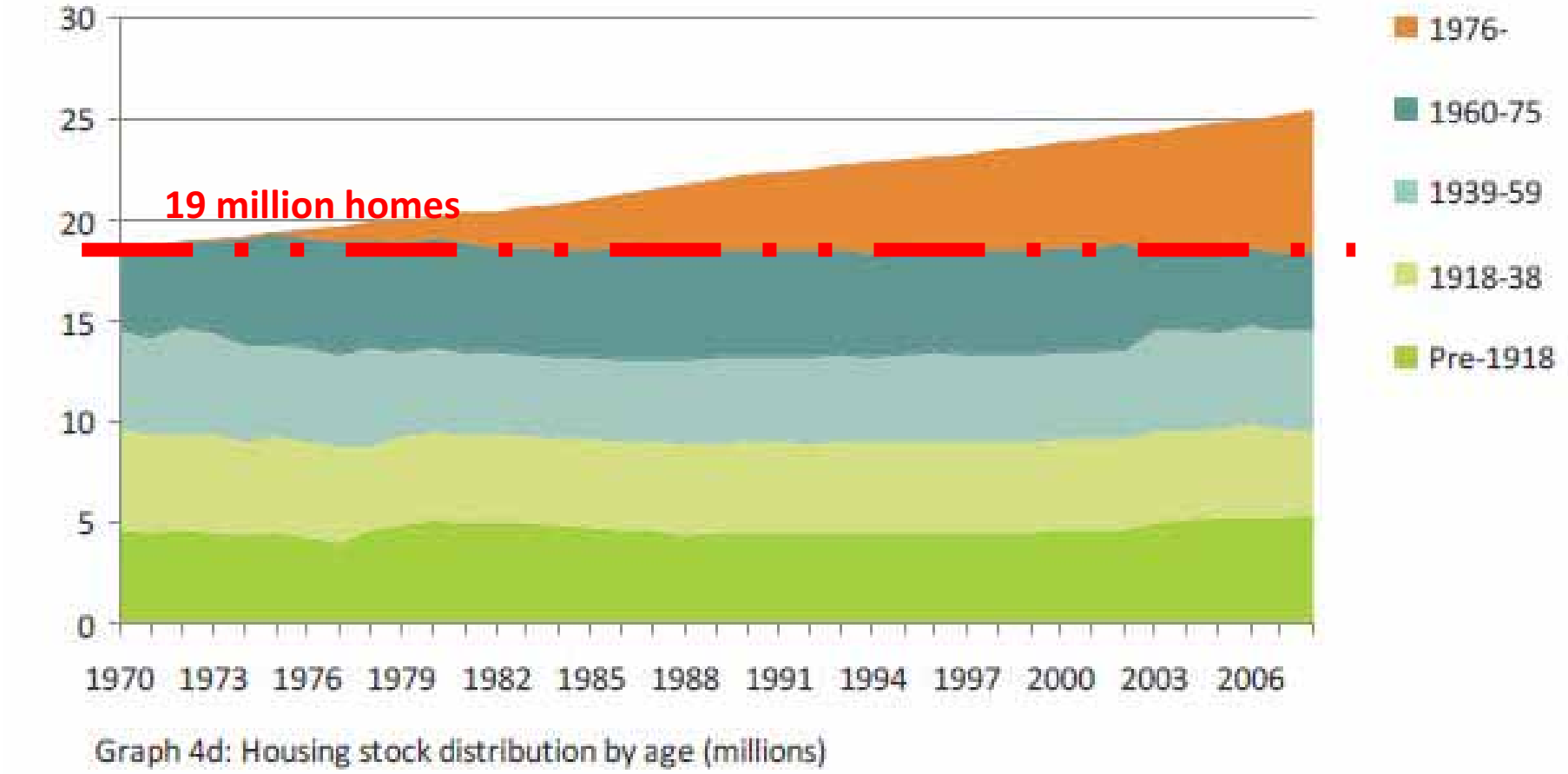
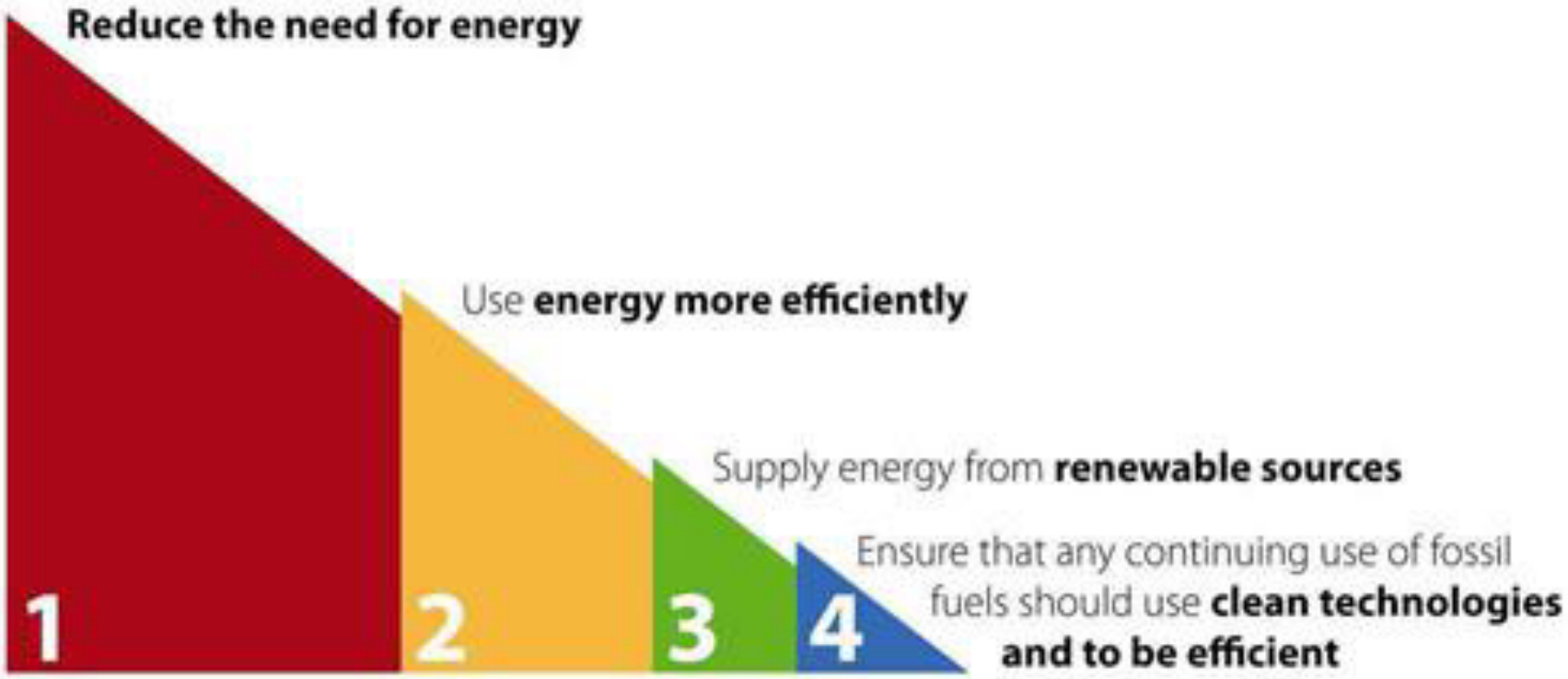
Residential energy consumption

DTI 2004



Graph 4d: Housing stock distribution by age (millions)

19 MILLION HOMES WERE BUILT BEFORE 1960 – only homes built after 1972 were required to have any insulation



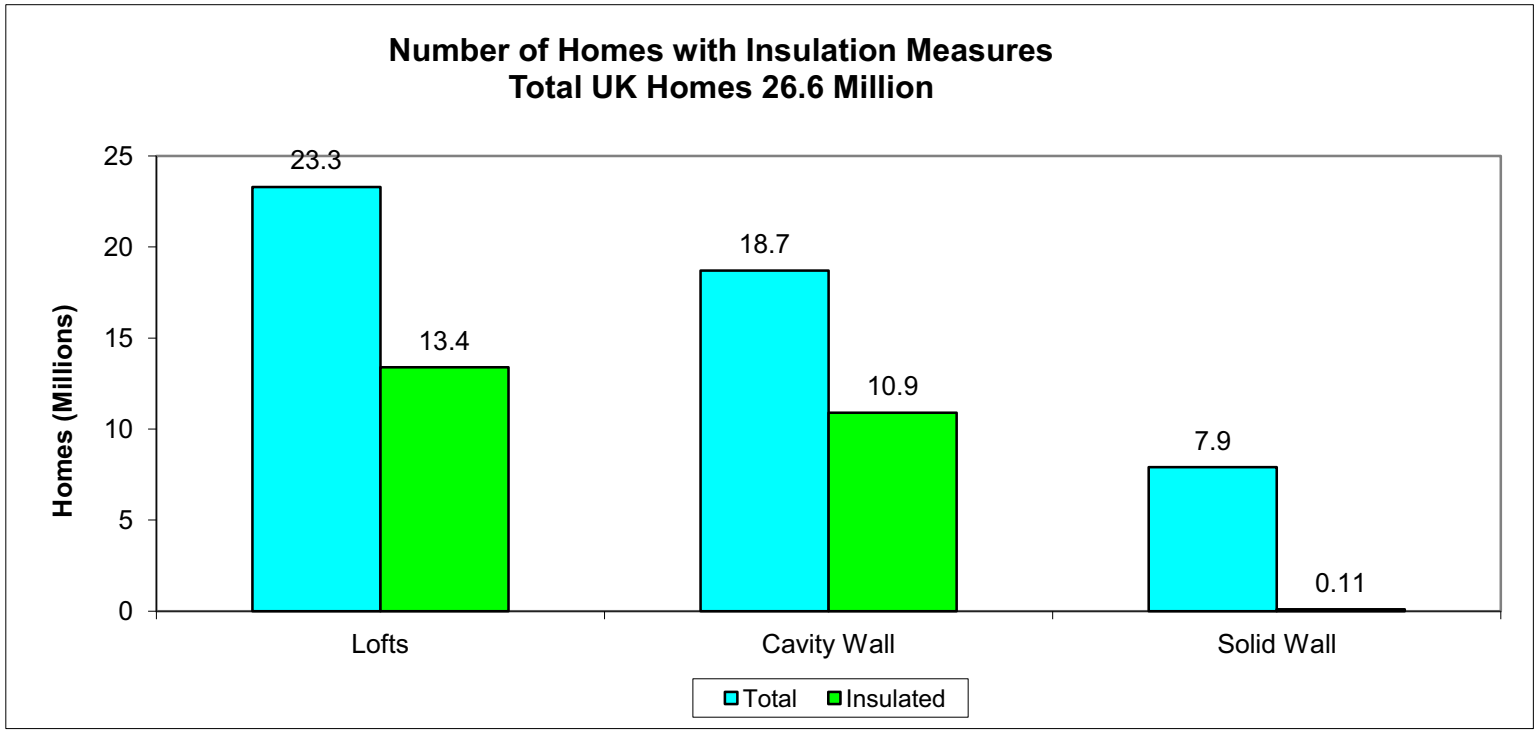
ENERGY HIERARCHY

The UK takes a ‘fabric first’ approach – ie first make the buildings very energy efficient then change behaviour, then invest in expensive technology

Insulation of roofs and walls in UK houses

DECC - ESTIMATES OF HOME INSULATION LEVELS IN GREAT BRITAIN: July 2011 – updated quarterly

after 20 years of insulation programmes we see that publicity and giving money is not enough to make houses energy efficient



The Green Deal

DECC

Department for Energy and Climate Change

The Green Deal :

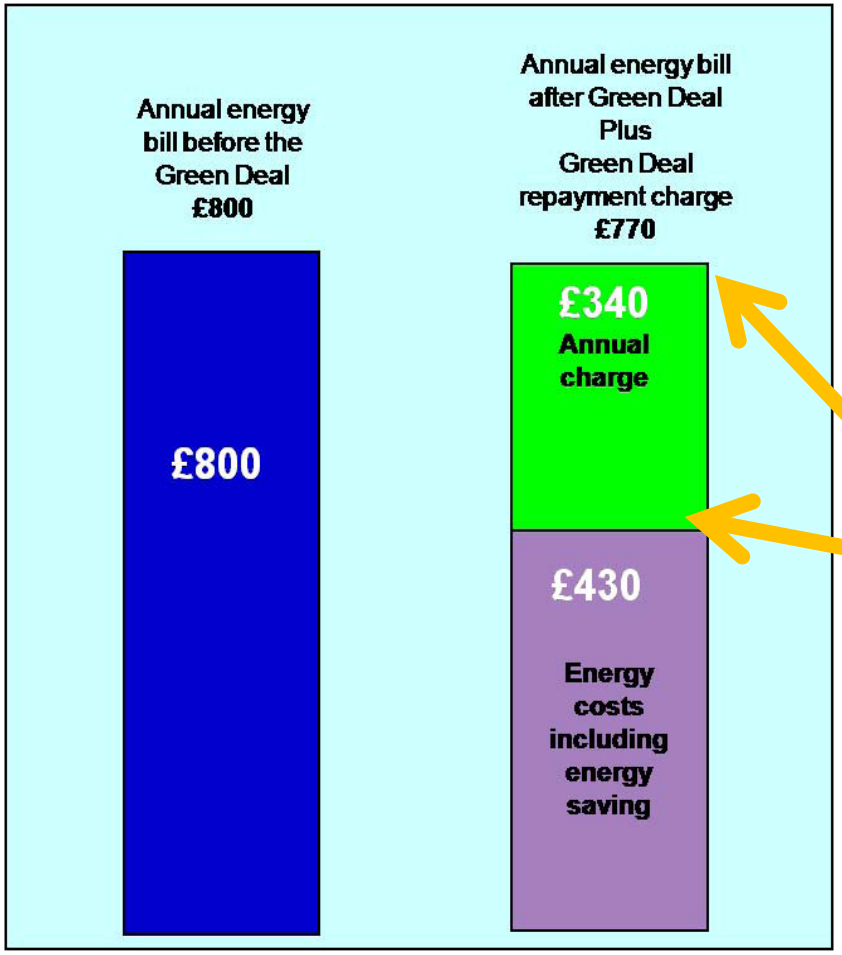
Is **not** a mortgage

Is **not** a personal loan

A good credit reference is **not** needed

Is **not** a grant (money)from Government

THE GOLDEN RULE



1. Maximum loan is linked to golden rule and may not provide enough money
2. BECAUSE
3. The repayments MUST be less than the PREDICTED energy savings

ECO – Energy Company Obligation

1. Paid for by a charge on everyone's electricity bill
2. Replaces existing programmes
3. in addition to Green Deal
4. Available to the poorest people
5. Available to people living in the worst quality houses

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Blended Finance

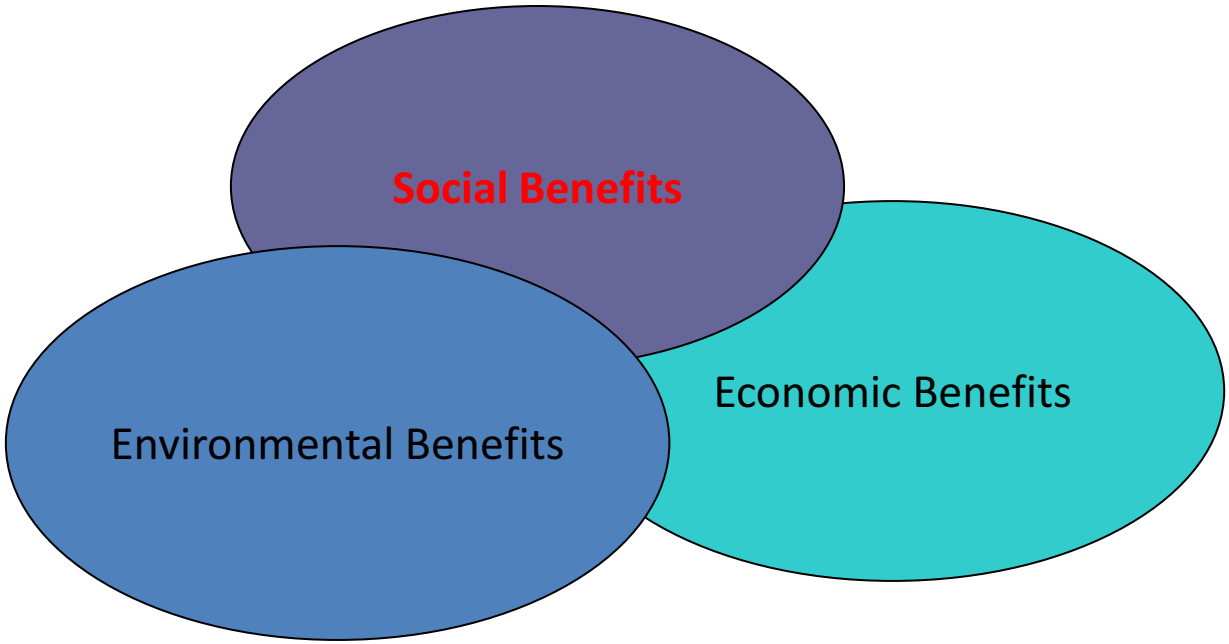
Loans – Green Deal, Credit Unions, Mortgages, Mutuals

Grants – ECO, TSB

Private finance – housing associations, householders

Green Deal objectives

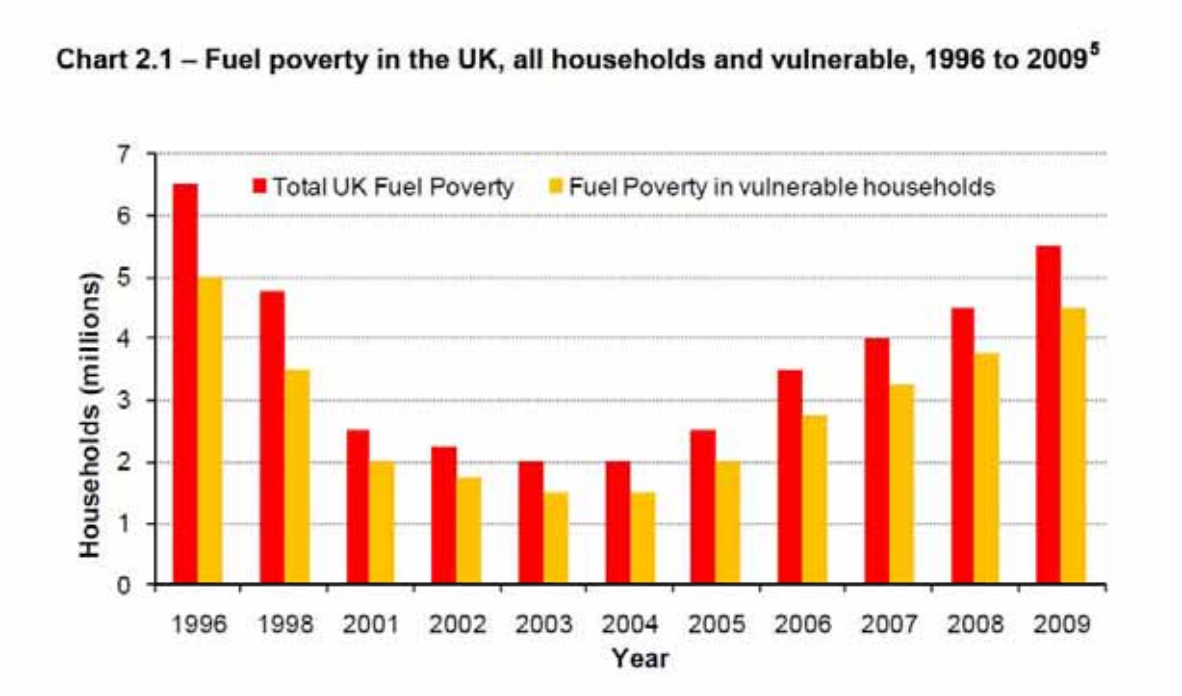
1. **support the delivery of UK carbon budgets**
2. **improve energy security of supply**
3. **social and health benefits for the poor**
4. **provide a driver for installation of renewables**
5. **kickstart the economy through the construction sector** by stimulating demand for energy efficiency home improvement measures



Fuel Poverty – a growing issue

definition was > 10% income spent on household energy

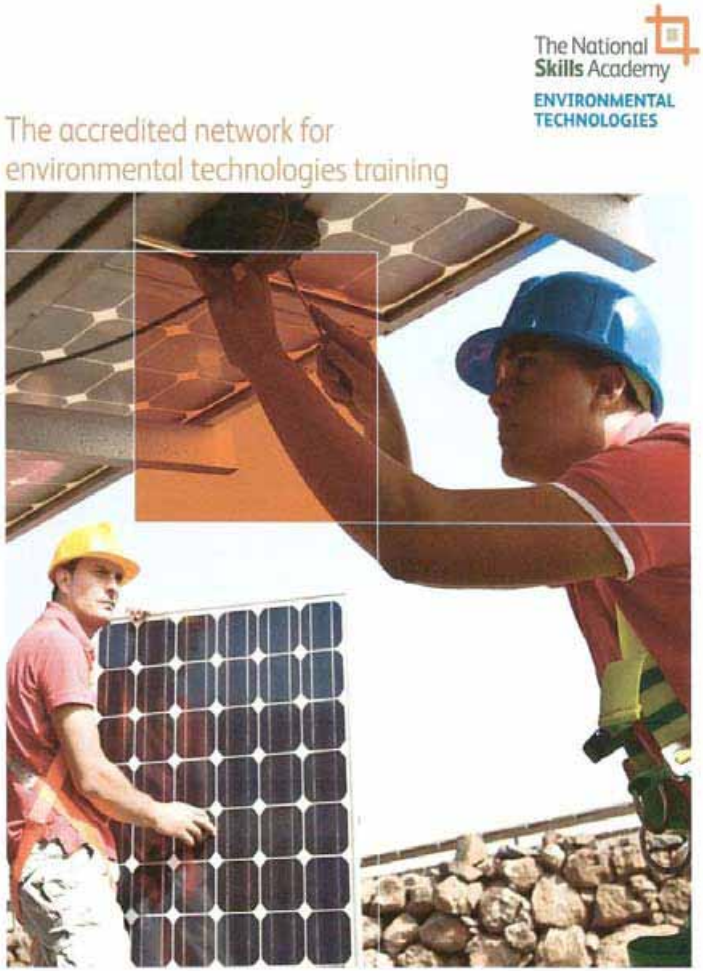
Government will consult on new framework in Spring 2014 – focus on people or buildings



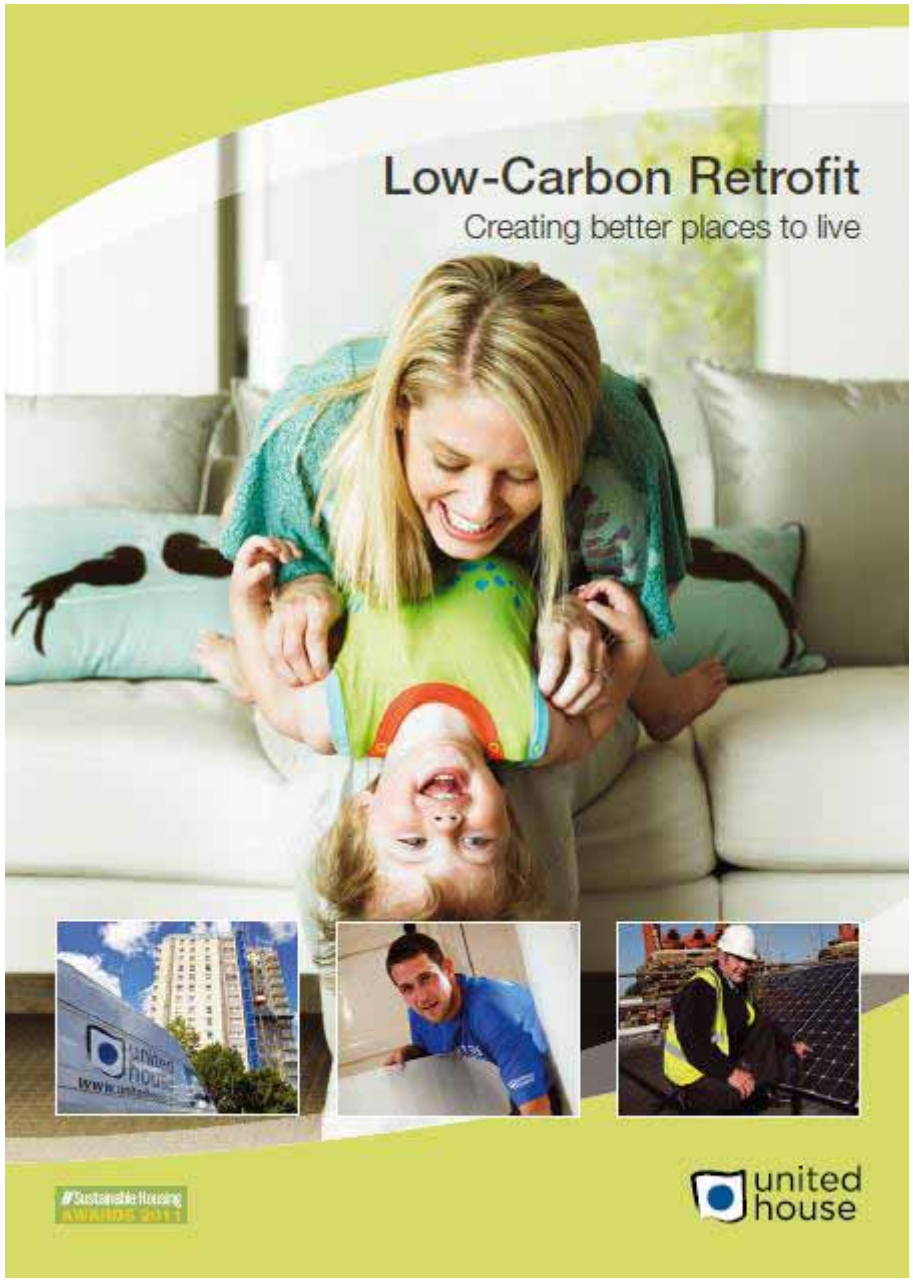
The retrofit employment opportunities

Across the board to include:

- Energy assessor
- Customer liaison
- Surveyor
- Mechanical & Elect Engineering
- Sales & Marketing
- Project Management
- Distribution and logistics
- Admin & Clerical
- Consulting & Professional services
- Installation Trades



www.nsaet.uk



http://lowcarbon.unitedhouse.net/case-studies

There are lots of case studies about energy efficiency demonstration projects.

This case study give examples of each element of energy saving for a building

Project Part-Financed by the European Union
European Regional Development Fund

ERDF projects

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AIM HIGH	Accelerating Innovation in Mass Market Housing and Green Homes
BECCI	Built Environment Climate Change Innovations
CoRE	Centre of Refurbishment Excellence
EBRI	European Bioenergy Research Institute
	Science City Energy Efficiency
SBF	Sustainable Building Futures
Accord ERDF	Sustainable Retrofit and Smart Grids

Sustainable Building Futures

accord group

Coventry University

Warwickshire/Coventry Web Portal

- Website linking enquiry to local contractor
- PC, tablet, smart phone format
- NES SAP calculation engine
- Variable levels of input
- Measures flagged low cost/high saving/DIY
- Grants, case studies, contractors
- Feedback comments
- Forum

SOME NEW ISSUES FOR SUSTAINABLE CITIES

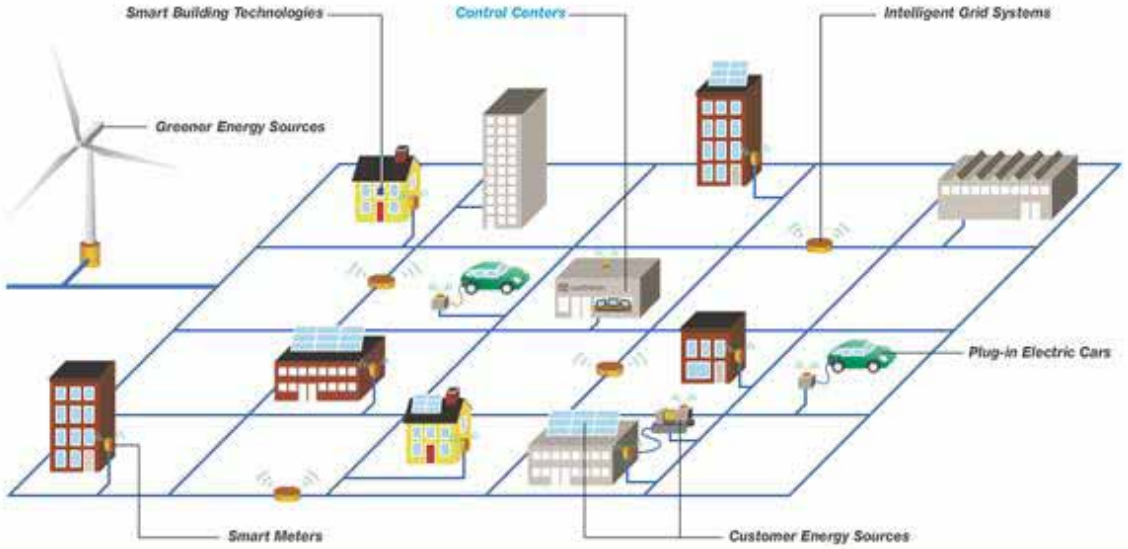
SMART GRIDS

SMART HOMES

conEdison

Smart Grid

Smart grid puts information and communication technology into electricity generation, delivery, and consumption, making systems cleaner, safer, and more reliable and efficient.

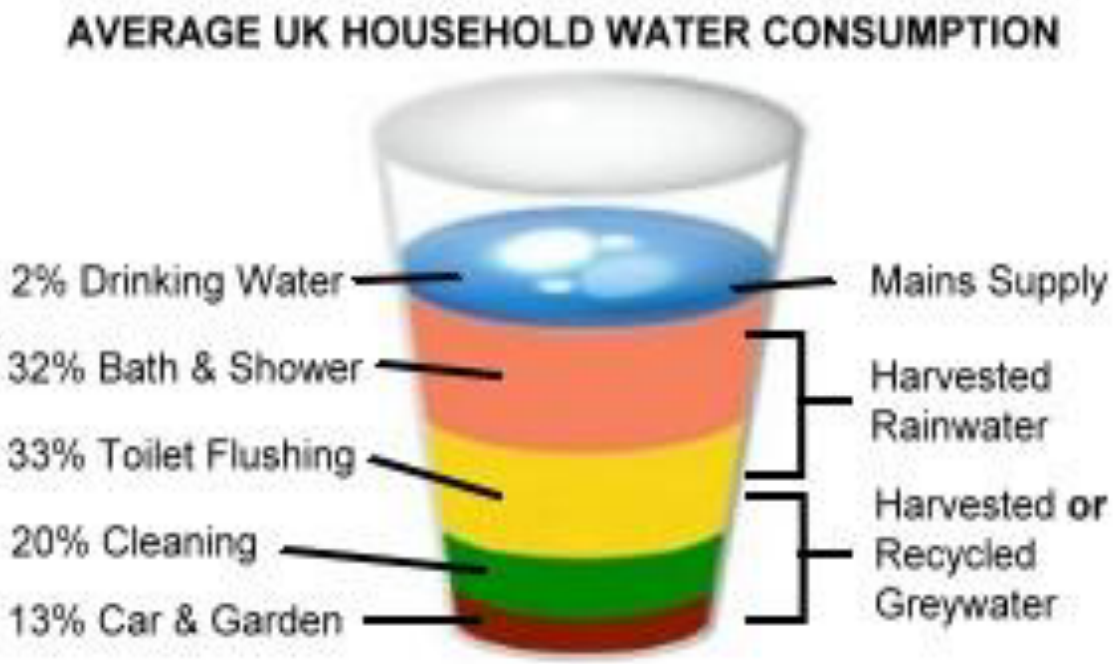


Water Resources

Issues eg

- Flooding
  - Surface water
  - Rivers
  - Sea
- Pollution when drains overflow
- Managing reservoirs
- Protecting habitats
- Drought

Water capture and recyling



green roof technology can demonstrate benefits :

- Air quality
- Water resource management
- Public amenity
- Biodiversity
- Waste management using recycled construction materials
- Health
- Reduction in URBAN HEAT ISLAND
- Energy saving – difficult to prove scientifically for a wet roof

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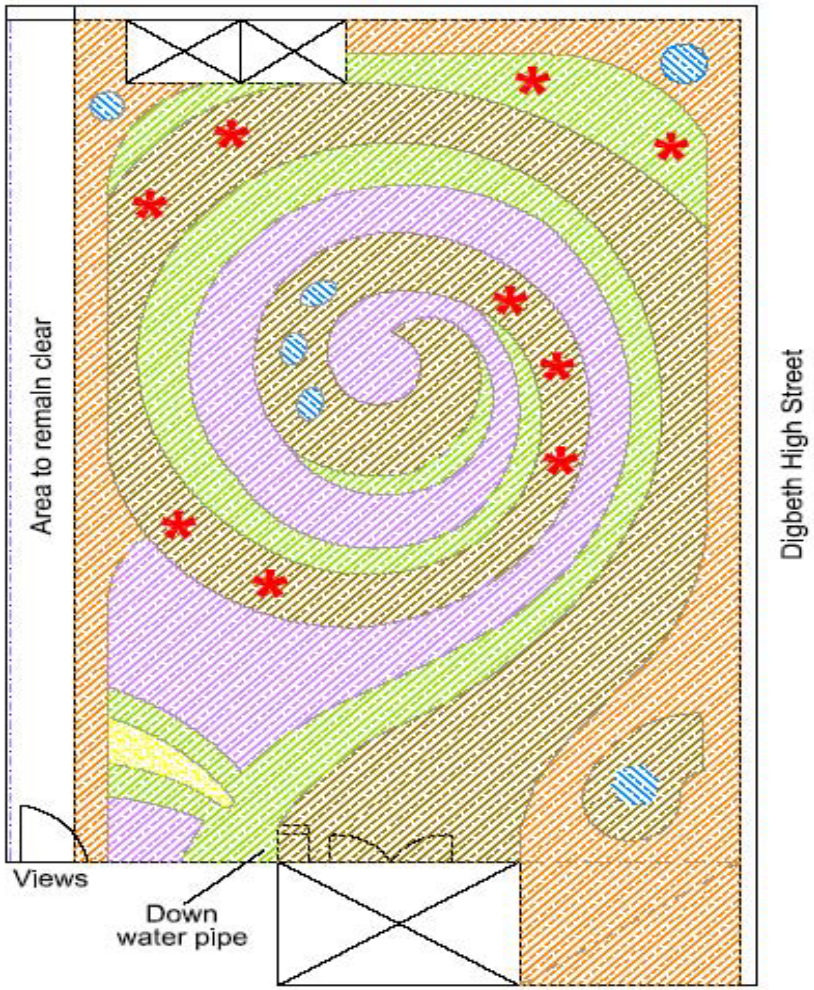
BVSC roof design



Seed Mixture for BVSC Roof.
All seed to be native and supplied by Emorsgate Wild Seeds:
Tel: 01553 829028 Limes Farm, Tilney All Saints, Kings Lynn, Norfolk, PE34 4RT.

Seed mixture to be supplied in the proportions as listed in the specification. To be spread at 1.5 grams per meter2.
Seed to be mixed with dried, non sharp sand, colour to be approved before mixing
Divide roof area into lots and allocate appropriate quantity of seed per lot before mixing with sand.

Mix Design %			
6	*Agrimonia eupatoria*	Agrimony	Grassy places in fields & hedgerows
6	*Agrostemma githago*	Corn cockle	Cultivated & waste ground
5	*Anthyllis vulneraria*	Kidney vetch	Grassland, dunes, cliff tops, waste ground, usually calcareous
5	*Centaurea cyanus*	Cornflower	Traditionally native to cornfields, now mainly in waste places
5	*Centaurea nigra*	Common knapweed	Grassy places, rough ground & waysides
3	*Daucus carota*	Wild carrot	Grassy & rough ground mostly on chalky soils and near the sea (scarce)
5	*Echium vulgare*	Viper's-bugloss	Open grassy places, cliffs, dunes, shingle, rough ground on light calcareous soils
6	*Knautia arvensis*	Field scabious	Dry grassy places on light soils
5	*Leontodon hispidus*	Rough hawkbit	Basic, often calcareous grassland
4	*Leucanthemum vulgare*	Oxeye daisy	Grassy places, especially rich soils
1	*Linaria vulgaris*	Common toadflax	Rough & waste ground, stony places, banks, open grassland
5	*Lotus corniculatus*	Birdsfoot trefoil	Grassy & harsh places, mainly well-drained soils
2	*Origanum vulgare*	Wild majoram	Dry grassland, hedgebanks & scrub, usually on calcareous soils
2	*Papaver dubium*	Long-headed poppy	Arable ground, roadsides & waste places
4	*Papaver rhoeas*	Common poppy	Arable ground, roadsides & waste places
5	*Plantago media*	Hoary plantain	Neutral & basic grassland
5	*Prunella vulgaris*	Selfheal	Grassland, lawns, wood-clearings, rough ground
5	*Ranunculus bulbosus*	Bulbous buttercup	Dry grassland & fixed dunes
5	*Reseda lutea*	Wild mignonette	Disturbed, waste & arable land esp. calcareous soils
6	*Sanguisorba minor ssp minor*	Salad burnet	Calcareous or neutral grassland
5	*Silene vulgaris*	Bladder campion	Grassy places, open & rough ground
1	*Verbascum thapsus*	Great Mullein	Waste and rough ground, banks & grassy places esp. sandy and chalky soils
4	*Viola tricolor*	Wild pansy	Waste, marginal & cultivated ground
Mix as available	*Trifolium arvensis*	Hare's-foot clover	Walls, rocks, open grassland & maritime sand & shingle
Mix as available	*Sedum acre*	Biting stonecrop	Banish ground on sandy soils
100			

Key

Existing site salvaged stone (random size) to be re-spread 150mm deep. Allow for spreading 10mm deep sterilised loam over final surface (except where indicated otherwise).

Existing site salvaged stone (random size) to be mixed in equal parts with 20mm to sand crushed demolition aggregate. To be spread 100mm deep unless indicated otherwise Allow for spreading 10mm deep sterilised loam over final surface.

Existing site salvaged stone (random size) to be mixed in equal parts with 80mm to sand crushed recycled demolition aggregate. To be spread 100mm deep unless indicated otherwise

Pure crushed recycled demolition aggregate 40mm to sand. To be spread 100mm deep unless indicated otherwise. Allow for spreading 10mm deep sterilised loam over final surface.

Pure recycled sand (clay and silt extracted) to be placed in mounds up to 200mm high in areas indicated

Tanked 'Wet' area to be formed by impeding rainwater. Minimum depth of substrate 75mm.

All recycled aggregate available from Coleman and Company Ltd
Tel: 0121 783 2583.
Note: Composition of aggregate to be composed of a minimum 60% recycled brick. Contact Colemans to establish source of aggregate and confirm composition prior to delivery. A higher concrete content (more than 40%) will be rejected

Location for hardwood log or tree stump (as available).

B.V.S.C., Birmingham
Green Roof Project

Green Roof Project
B.V.S.C.
Landscape

Black Redstart Habitat on BVSC Roof – Digbeth
August 2007

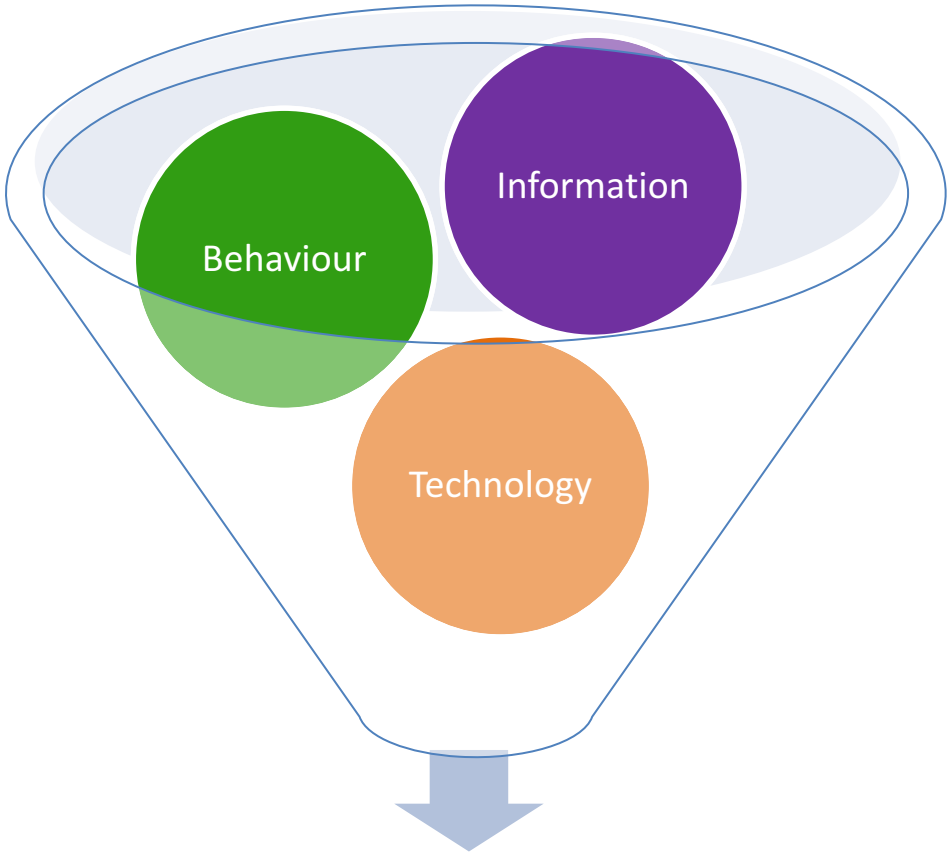
Funding opportunities:

- **DECC - Big Energy Saving Network – closes 5pm on 9th October 2013 – late entries may be accepted**
- Open to third sector – value £4,700 – total value £752,000 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/244986/BESN_Guidance.pdf
- **DECC – Green Deal Communities** – closes December 2013 or when all funding allocated
- Open to Local Authorities – value £1m to £3m – total value £20m
- **CSE – Green Open Homes Competition** – http://dev.greenopenhomes.net/support-for-organisers/competition - next rounds - 9 December 2013 and 24 February 2014
- Value - £500 to £20,000 – total value £180,000

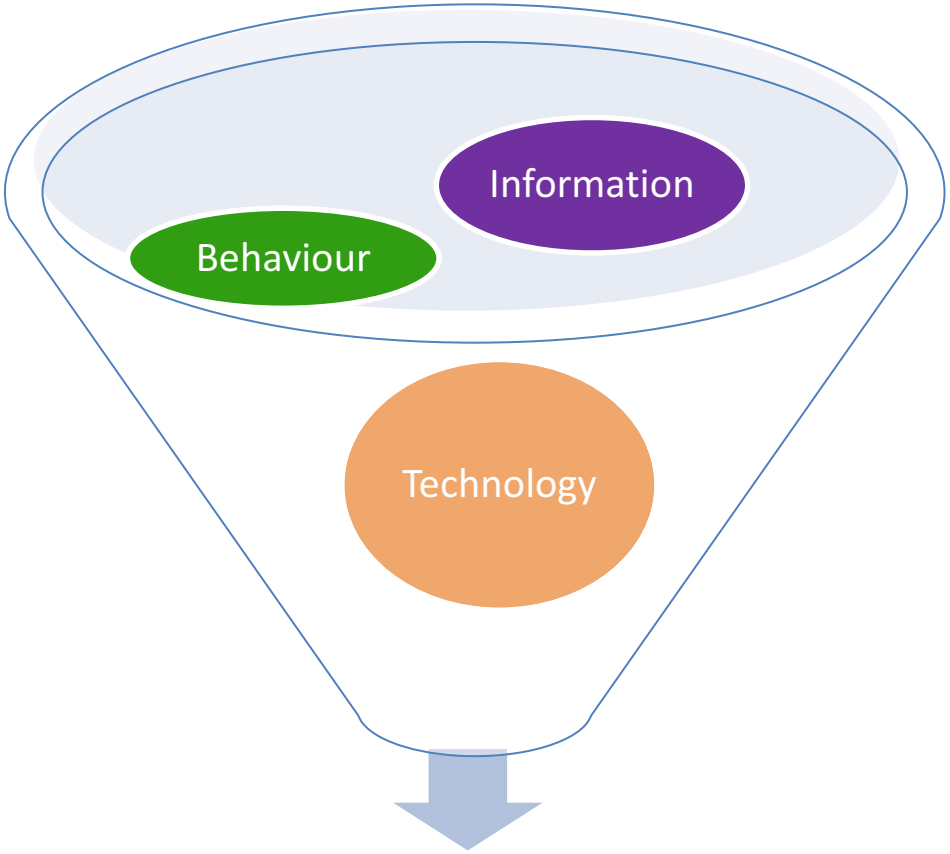
Champions

Time to take action

Ingredients of the Transition to Sustainable Homes (making a good project)



But if we don’t get the right mix ….



We get unexpected consequences –

condensation/mould, increased energy use, thinking PV works at night

Retrofit Categories
project
product
closing date 1 November 2013
awards dinner 4 December 2013

- http://www.shap.uk.com/wp-content/uploads/2012/09/mebc-business-success-awards-2013-info.pdf

Thank you

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