

Overview of Innovation and Product/Technology Implications Related to Eco-Retrofit

Eastleigh June 2010

Russell Smith





Making your house an eco house

By William Mach
Last Updated: 12:01am BST 18/06/2007

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Much of Britain's new housing stock is being made more environmentally friendly but what about older properties?

Can similar high standards and specifications be applied when renovating existing and older houses and flats?

The trouble is not many people have the know how or the inclination to take such projects on.

But turning a 19th Century end of terrace £200,000 house into an ecohome of the future was a labour of love for Russell Smith.



Russell Smith outside his Victorian eco-house in Sutton, Surrey; Making your house an eco house



Winners of Building Magazine's 2007 Award for Sustainable Refurbishment

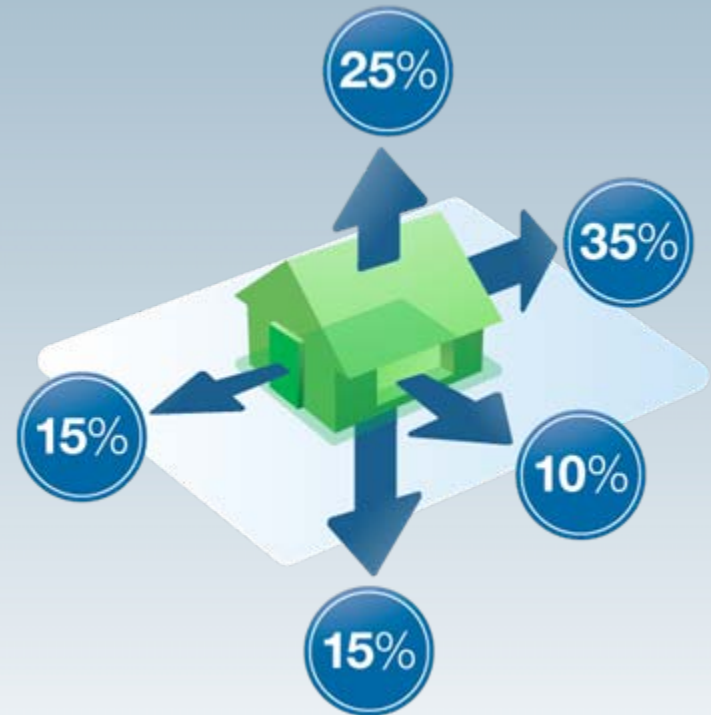
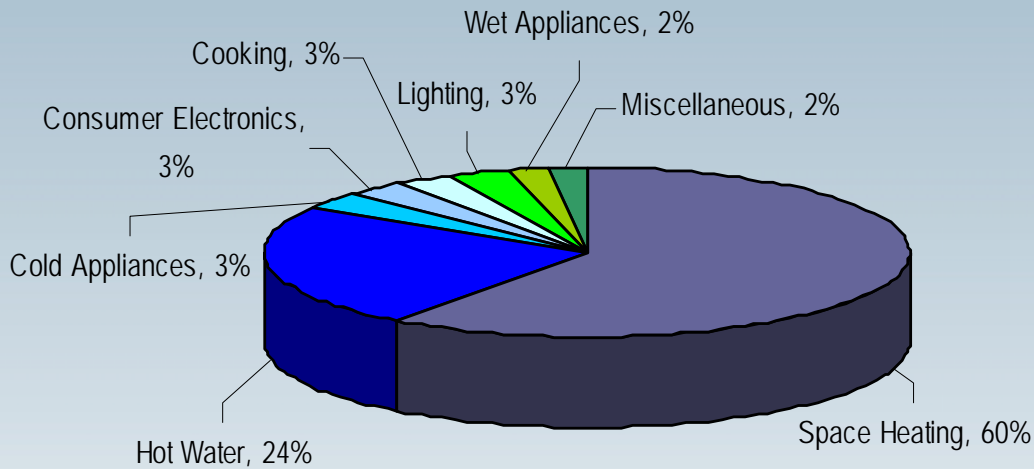


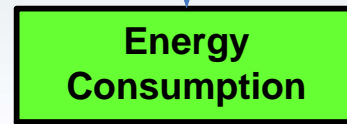
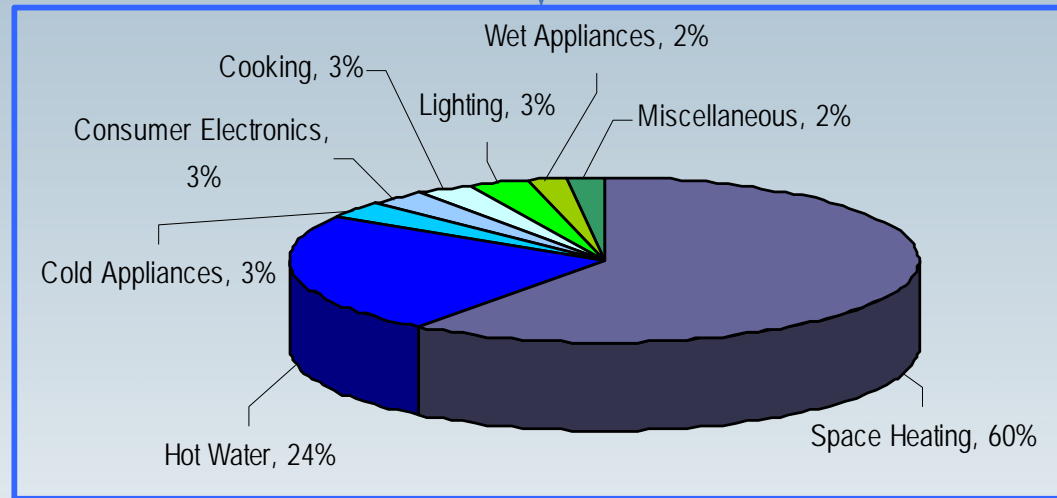
The Issues:

- Overview of Innovation
 - Every house is unique
 - Nothing new!?
 - SME Contractors know 90% already
 - Anything left to discover?
- Implications for Products/Technology
 - Finance
 - Testing, testing, testing
 - Accreditation on installation



One Size Does Not Fit All







RANKED BY PAYBACK PERIOD

INITIATIVE AREA	DETAILS	ANNUAL FUEL COST SAVING	DIY INSTALL COST	PROF. INSTALL COST	DIY PAYBACK PERIOD (yrs)	PROF. PAYBACK PERIOD (yrs)
APPLIANCES	Only wash clothes at 30 degrees	£17	£0	N/A	0.0	N/A
HEATING	Turn down thermostat by 1 degree	£189	£0	N/A	0.0	N/A
HEATING	Zone the upstairs of the house using TRVs and set thermostat to be 1 degree lower than downstairs	£111	£0	N/A	0.0	N/A
HOT WATER	Add additional insulation to the hot water cylinder	£68	£20	N/A	0.3	N/A
ELECTRICITY	Systematically replace all remaining inefficient lamps with compact fluorescent lamps	£169	£70	N/A	0.4	N/A
HOT WATER	Install Low Flow shower heads on all showers running off the mains hot water	£32	£30	£300	0.9	9.3
DRAUGHTS	Thoroughly draughtproof cellar door	£5	£10	N/A	2.1	N/A
ROOF INSULATION	Add 50mm PIR or equivalent to the ceiling of the flat roof	£71	£254	£318	3.6	4.5
HEATING	Install a modern highly efficient condensing boiler	£575	N/A	£2,500	N/A	4.3
DRAUGHTS	Draughtproof all doors and windows	£34	£200	£5,100	5.8	148.5
DRAUGHTS	Thoroughly draughtproof loft hatch	£2	£10	N/A	6.5	N/A
APPLIANCES	Install two new top energy rated fridge freezers	£80	£600	N/A	7.5	N/A
WALL INSULATION	Internally insulate all solid external walls with 50mm PIR insulation or equivalent	£379	£2,894	£3,617	7.6	9.5
FLOOR INSULATION	Insulate solid ground floor with 100mm PIR insulation or equivalent and install water based underfloor heating and highly efficient condensing boiler	£630	N/A	£5,340	N/A	8.5
DRAUGHTS	Conduct an air tightness test with a blower door and smoke sticks and seal draught points that might be expected given the building fabric	£46	£400	£500	8.6	10.8
HOT WATER	Install 4m2 evacuated tube facing West with its own solar pump	£120	N/A	£3,700	N/A	30.7
HOT WATER	Install 4m2 flat plate solar panel facing West with its own solar pump	£119	N/A	£3,700	N/A	31.1
WALL INSULATION	Externally insulate side and back walls with 100mm PIR or equivalent	£331	N/A	£12,292	N/A	37.1
WINDOWS	Add secondary glazing to all vertical windows	£123	£4,760	£6,375	38.6	51.7
HOT WATER	Install 8m2 flat plate solar panel facing West with its own solar pump	£121	N/A	£5,350	N/A	44.1
ELECTRICITY	Solar PV panels - a six panel array (~8m2) facing East	£95	N/A	£4,800	N/A	50.4
ELECTRICITY	Solar PV panels - a three panel array (~4m2) facing East	£48	N/A	£3,150	N/A	66.2
WINDOWS	Upgrade windows to Building Regulations for replacement windows	£140	N/A	£10,200	N/A	72.8
ROOF INSULATION	Add mineral wool or equivalent to the roof space up to 300mm	£11	£795	N/A	73.6	N/A
WINDOWS	Upgrade windows to top specification argon filled, low emissivity coated double glazed windows	£126	N/A	£17,000	N/A	135.1
DOORS	Upgrade all external doors to current Building Regulations	£17	N/A	£2,400	N/A	140.0
WINDOWS	Replace all roof windows with top specification alternatives	£7	N/A	£3,000	N/A	438.2



4.6 GREEN HALO

For this Masterplan the 'green halo' threshold for individual measures has been set at **£7,500** and a payback of **25 years**. *It is assumed that all 'no brainer' and 'some consideration' measures are also carried out.*

RECOMMENDED MEASURES

Internally insulate the existing external walls to beyond current Building Regulations Standards $U=0.21$

Solar PV panels - a six panel array (~8m²) facing south (with 41.3p FIT)

DIY Professional



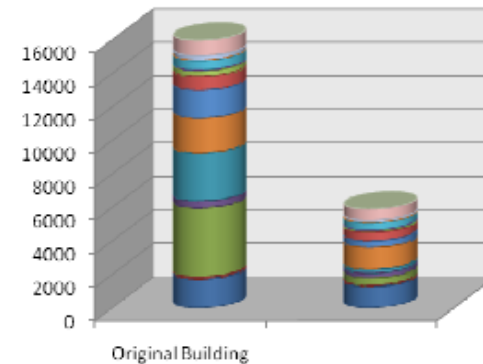
STATISTICS

Estimated annual saving	£1,905
Estimated cost of measures (include 'no brainer' and 'no consideration')	£15,126
Estimated annual CO ₂ saving	63% - 10.1 tonnes
Estimated annual energy reduction	66%
Estimated Payback Period	7.9 years

Peak Heat Load for Boiler (External Temp @ - 4degC) = 10.456kW

parity home energy masterplan

ANNUAL CO₂ - BEFORE AND AFTER



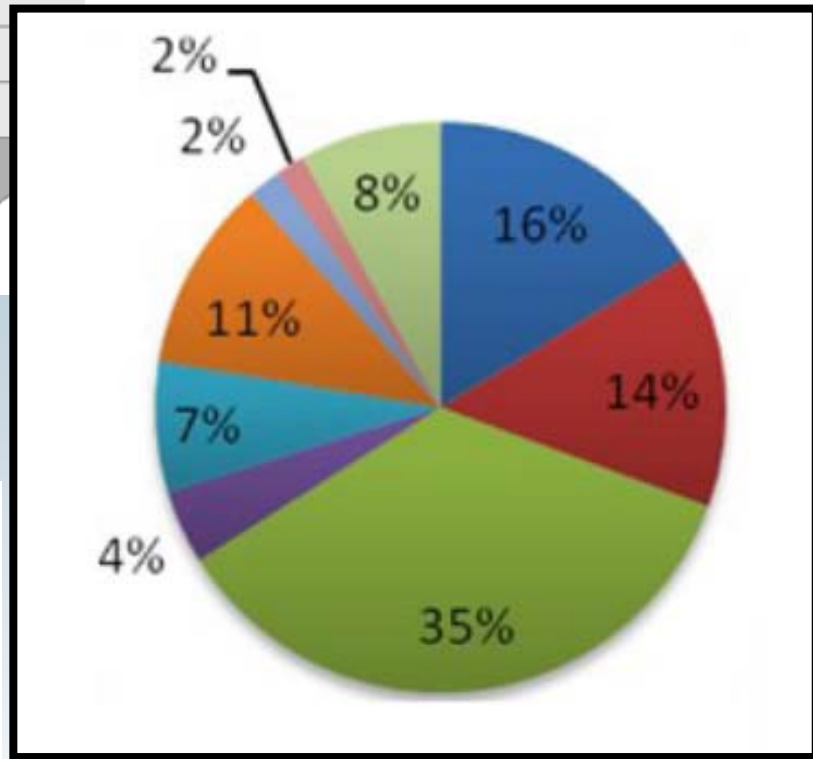
Do we need to discover anything else?

PARITYPROJECTS

Delivering Sustainable Development

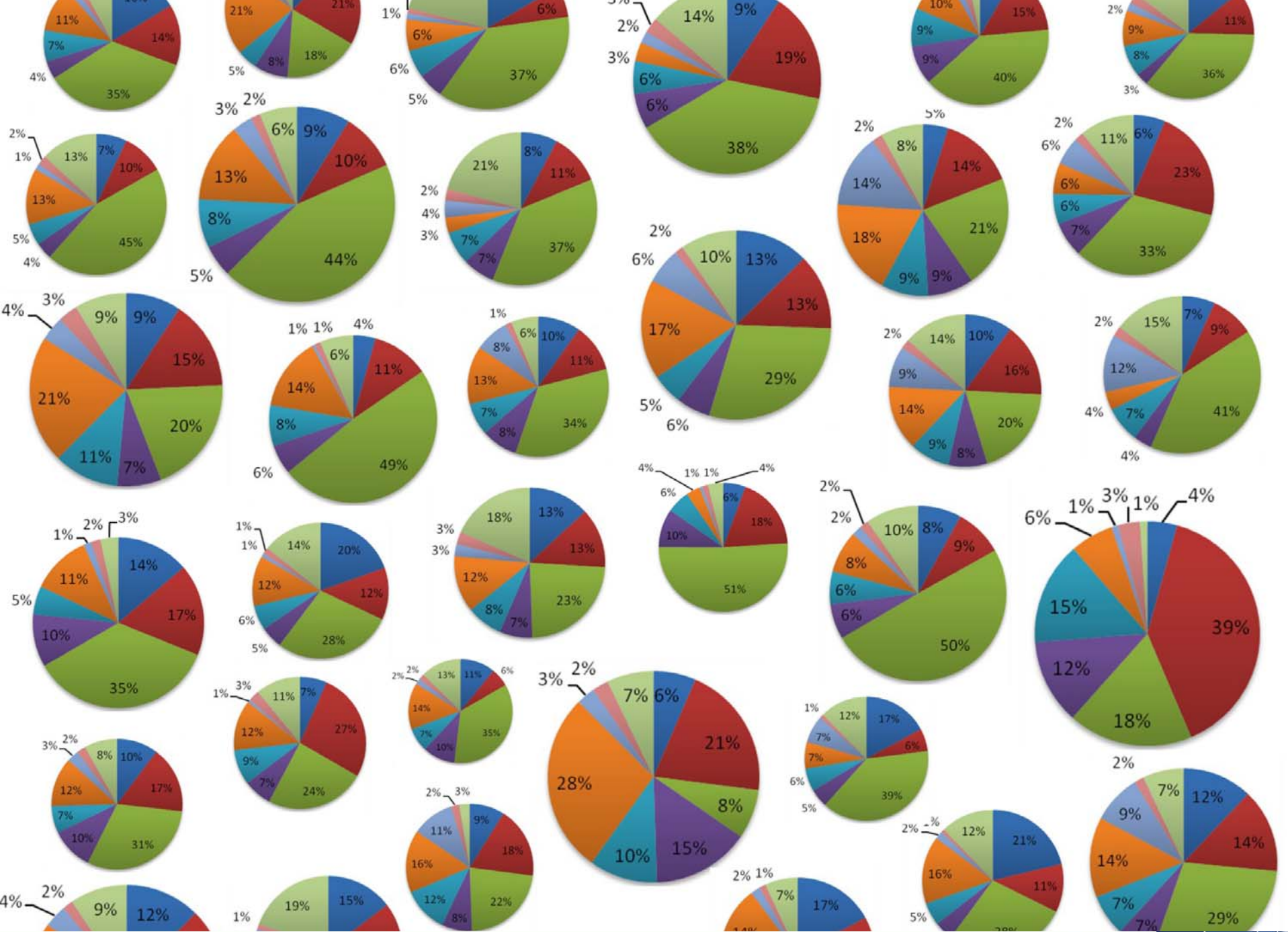


- Micellaneous
- Lighting
- Electric Cooking
- Cold Appliances
- Wet Appliances
- Gas Cooking
- Consumer Electronics
- Hot Water



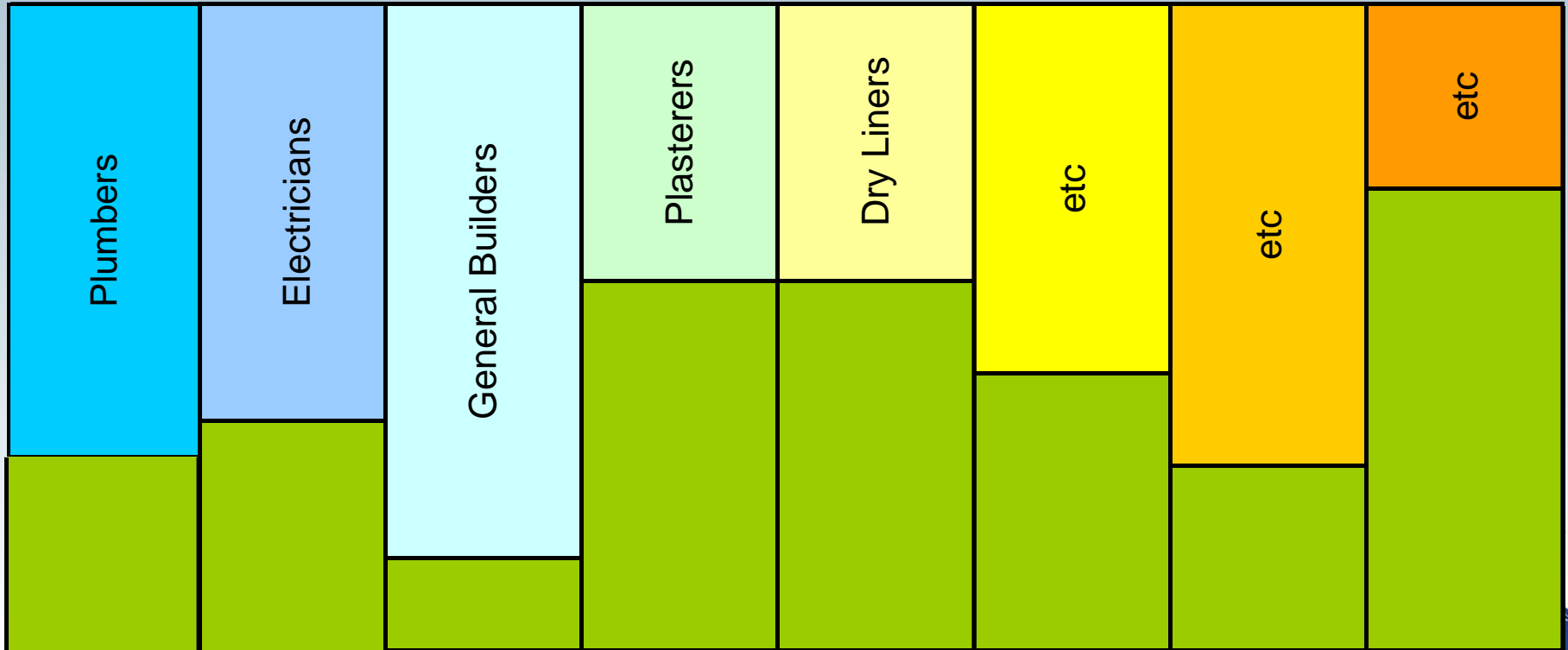
- Windows/Doors
- Heating inefficiency
- Roof
- Floor
- Lights
- Hot Water
- Walls
- Appliances
- Draughts





Contractors already know '90%'

🌱 Training?

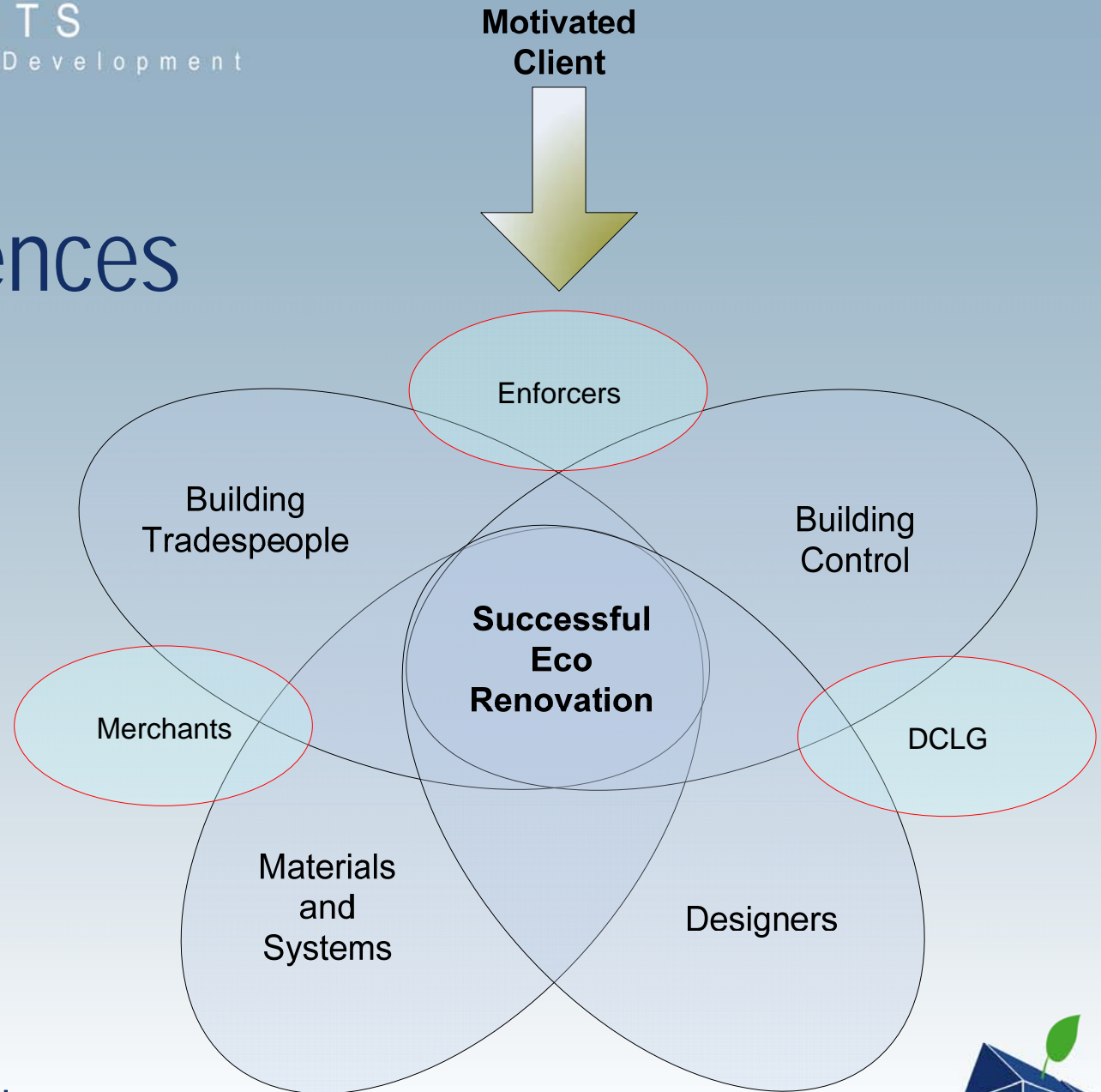


Motivating Contractors

- More work for building trades
- Economic Benefits and Environmental Benefits
- Rising Energy Prices
- But What About Up Front Costs?
 - "Concurrent" Work



Who Influences Change?

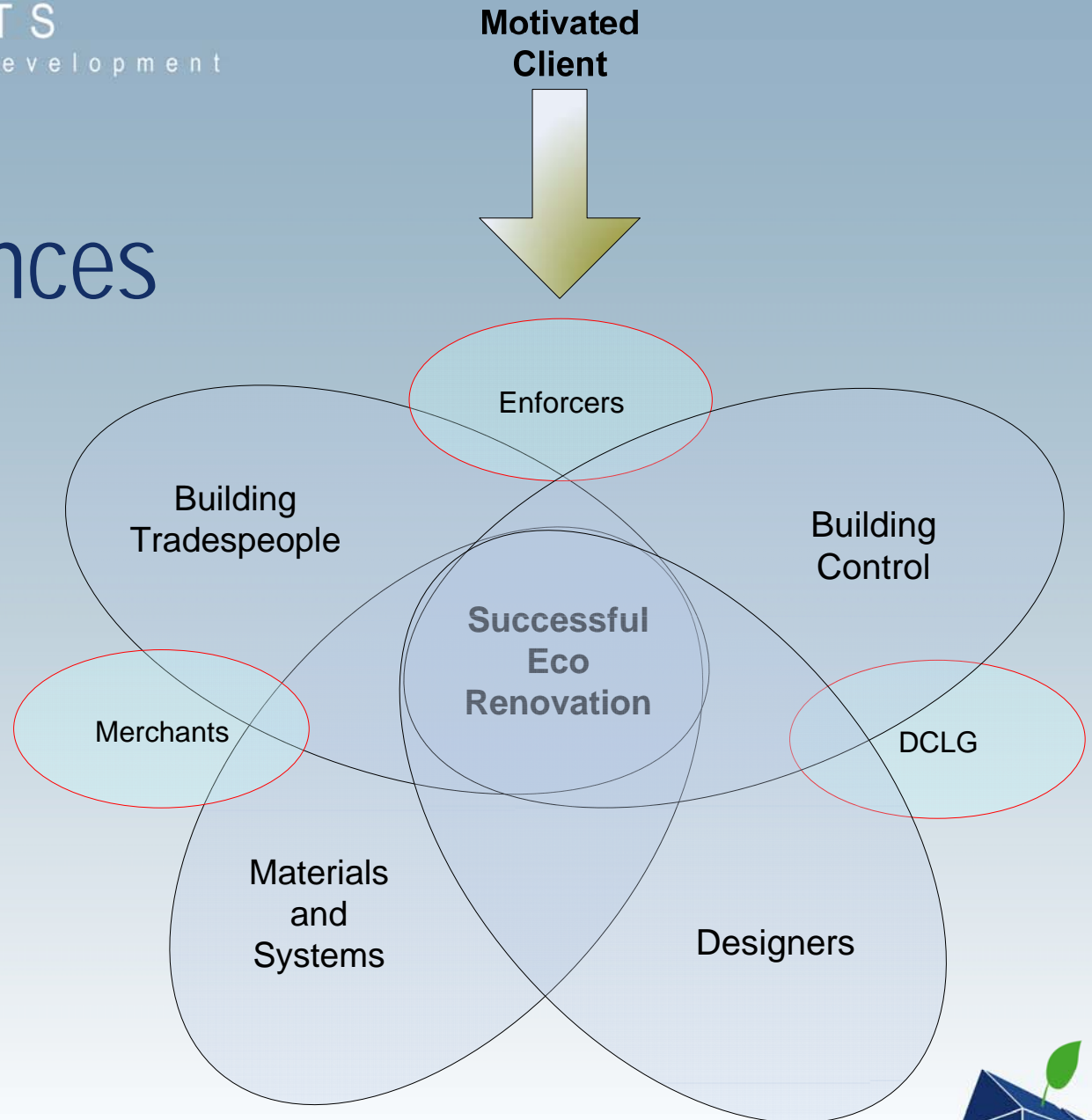


Major Works

- Development
- Extensions
- Insurance Work



Who Influences Change?



Minor Works

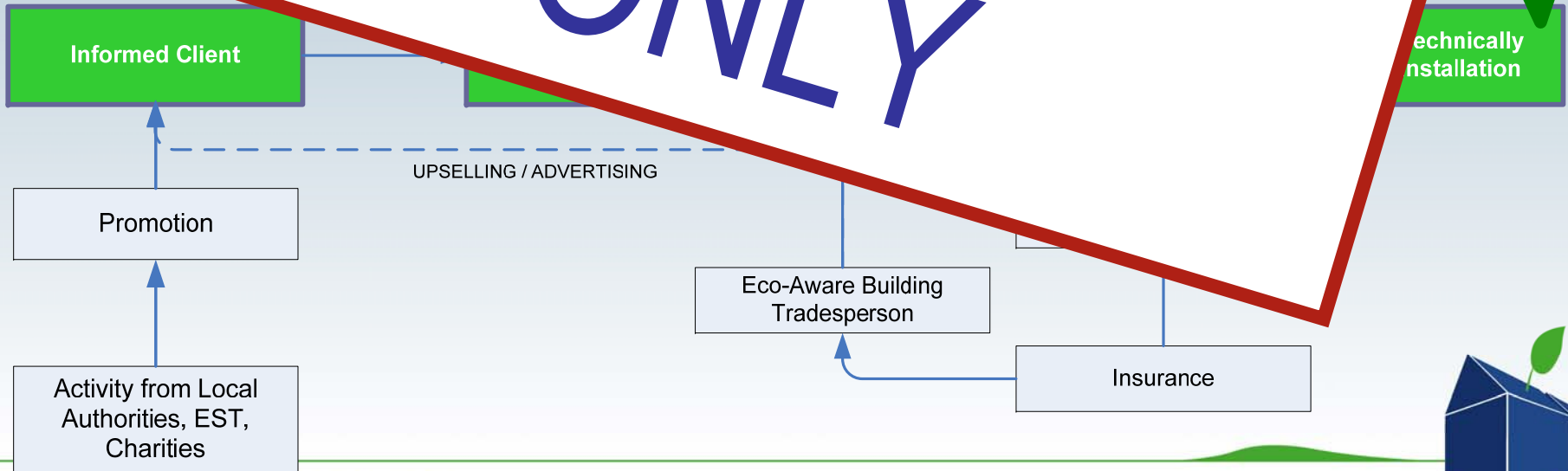
- Faults, Repairs
- Redecoration
- Obsolescence
- Fashion



What work will we be doing?

SKI

ONE VISIT ONLY



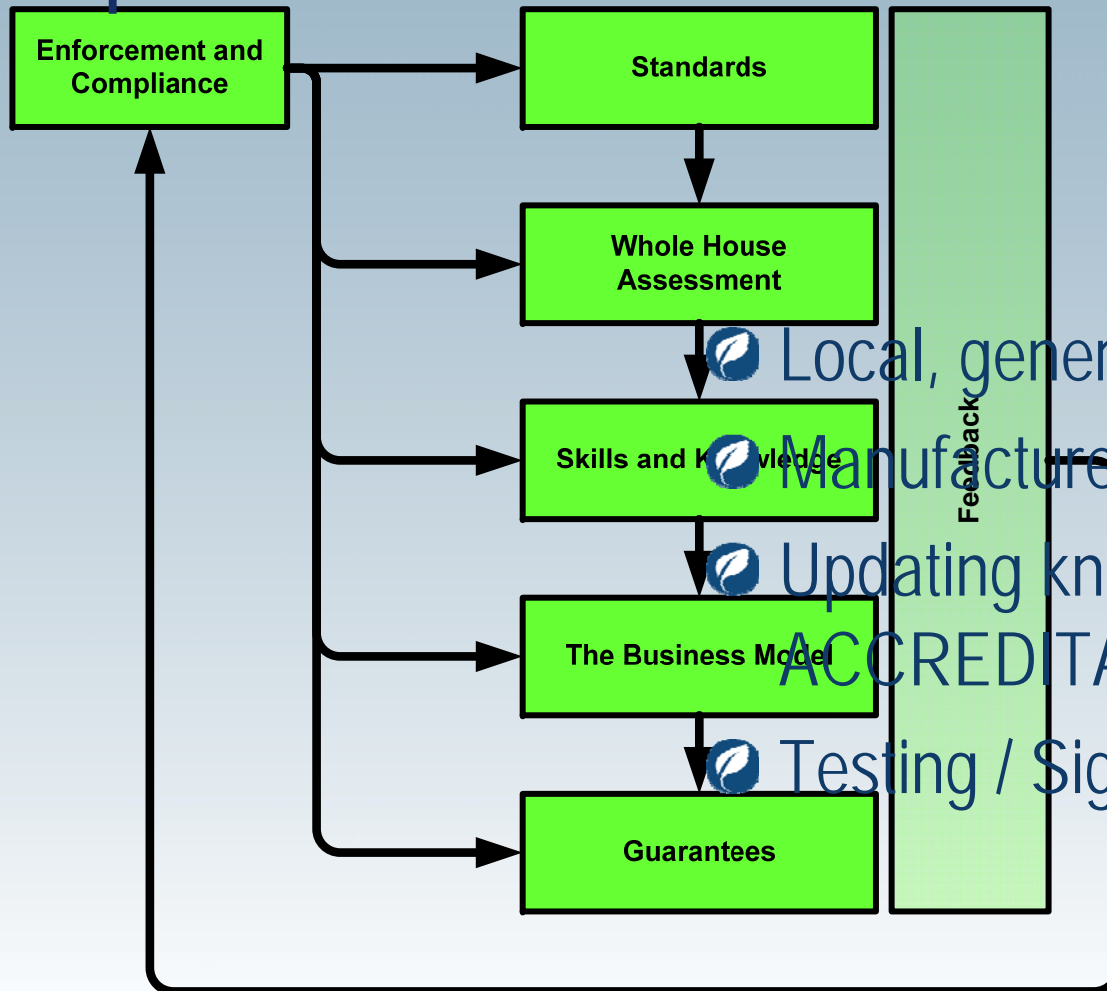
Motivating Concurrent Working



A Whole House Plan



Implications for Products / Technology



Local, generic education and skills
Manufacturers' training
Updating knowledge and skills –
ACCREDITATION
Testing / Sign-off



Implications for Products / Technology

- Finance
- Testing, testing, testing
- Accreditation of products and installers



The Parity Projects Courses

- BTEC accreditation
 - The first and only nationally accredited courses
 - Aligned with the needs of the manufacturer
 - Modular
-
- Available in SE with significant funding support



Managing

Installation

Manufacturers' Systems

The Business Case for Significantly Reducing Energy Consumption in Existing Buildings

An Introduction to Techniques for Significantly Reducing Energy Consumption in Existing Buildings

Building Regulations for Low Energy Domestic Refurbishment

Installing Insulation onto Solid Walls in Domestic Houses

Loft Insulation for all Construction Types

Retrofitting Ground Floor Insulation for all Construction Types

Air-Tightness and Thermal Bridging in Existing Buildings

Reducing Water Demand in Domestic Houses

External Wall Insulation Systems

Internal Wall Insulation Systems

Rainwater Recycling Systems



Summary

- 🌱 The vicious cycle of impedance
- 🌱 Logistics focussed products will win out
- 🌱 Raise the awareness of the whole supply chain
- 🌱 Common language to unlock success

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Demo House Open Days
Next - Sat 24th July
housetours@parityprojects.com

