



Beyond 40% House: Transforming the market for buildings

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BMT aims

BMT aims to influence the **policy and market framework** by:

- **Agenda-setting** for policy using scenarios
- Building on **Market Transformation** combining information, incentives and regulation
- Developing an **open source** model
- Developing an **inter-disciplinary approach**
- **Working with industry** to develop common understanding

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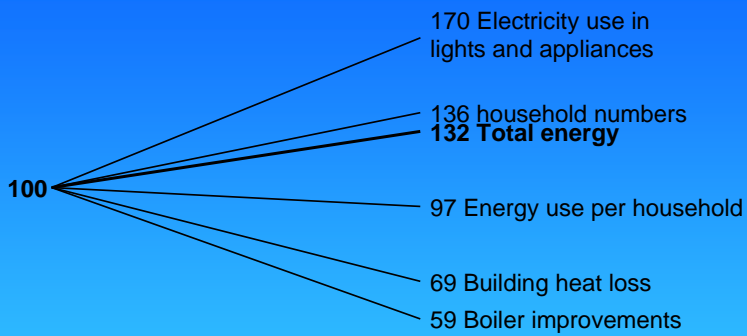


The Domestic Sector

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Energy trends 1970-2001



- Improvements in efficiency are outweighed by increases in households and in services

Based on Shorrocks and Utley (2003)

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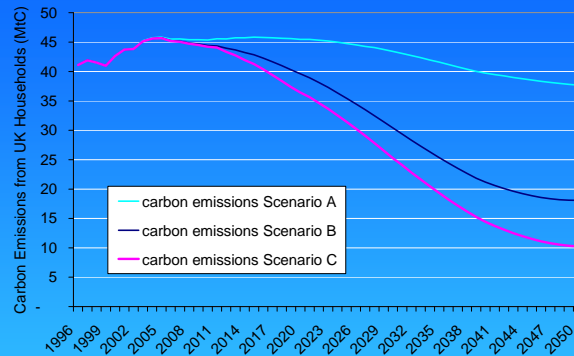
Population 40% House scenario

	1996	2050
UK population	59m	67m
Number of households	24m	32m
Household size	2.5	2.1
% of population aged 65+	16	25

- Household numbers projected to increase by a third with more people and smaller households

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Carbon emissions



An expected 33% increase in dwellings by 2050 plus more heat, more hot water, more appliances requires significant change

- Existing and new dwellings close to zero carbon
- Significant uptake of Low or Zero Carbon technologies
- Halving of projected lights and appliances consumption

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A 60% Reduction in homes



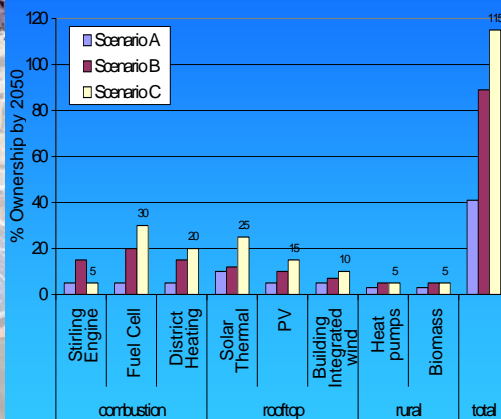
Because of an expected

- 33% increase in the number of dwellings by 2050
- more heat, more hot water per person, and a greater penetration of appliances

A 60% Reduction requires

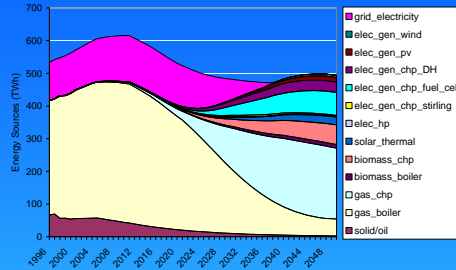
- A large improvement in existing dwellings through refurbishment moving from average E (SAP 45) to average A (SAP of 90+, close to zero carbon)
- Significant uptake of Low or Zero Carbon technologies which provide heat and, or, electricity from devices which are integrated into the building or community (such as CHP, PV, solar thermal, building integrated wind, heat pumps etc).
- Halving of projected lights and appliances consumption

Potential for microgeneration in homes



- Based on a raft of UK potentials studies
- **Combustion based opportunities** - generate heat and maybe electricity. Community heating is for dense urban communities. Micro CHP is suburban or rural.
- **Rooftop opportunities** – capture wind or sun. Low cost opportunity in new build or when a roof is replaced, or converted.
- **Rural opportunities** – location dictates availability eg biomass, or heat pumps
- **New build versus refurbishment**

Low and Zero Carbon technologies

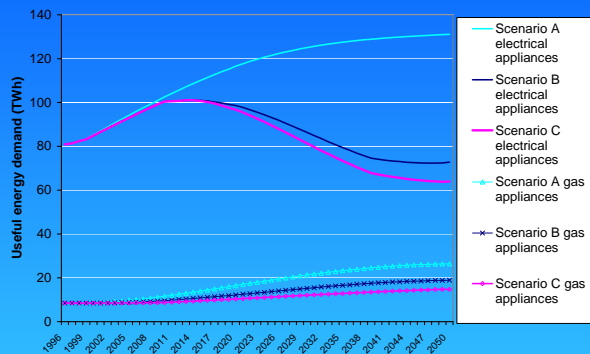


Massive potential for LZC

- **Combustion based opportunities** - Community heating and mCHP
- **Rooftop opportunities** – PV, solar thermal, micro-wind.
- **Rural opportunities** – biomass or heat pumps
- Explore uptake of 40%, 80% and 120%
- Buildings may be zero net importers
- Change may be organisational - ESCOs in new build

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Lights and Appliances



- A 56% reduction in projected electricity can be achieved
- Key sectors are refrigeration, consumer electronics and lighting
- Fuel switching is important

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The cost of change



- At face value, the scenario proposed appears expensive. However, this is not necessarily the case.
- Technology learning: for every doubling in global installed capacity or sales, there is a corresponding reduction in costs. If plotted over a log/log scale (eg price against volume of sales) the relationship becomes linear.
- Progress ratios have been observed between 60% and 95% (average 82%)
- Under a 40% House scenario, with very high levels of installation foreseen, capital costs could fall dramatically, and paybacks could fall to less than 5 years. Thus this scenario has plausibility.
- On whom does the cost fall? Through the development of Energy Services Companies (ESCO's) that the capital cost may not fall on the householder, but be considered as an investment justified by a return.

Market Transformation: a timetable to 2050



	overarching issues	Housing	LZC	Lights and appliances
2005-2050	Framework incentives eg <ul style="list-style-type: none"> • Personal Carbon Trading (PCT) • Governance: devolved targets and powers • Smart metering • Energy Service Companies (ESCOs) • Disclosure of energy and carbon emissions 	<ul style="list-style-type: none"> • Government procurement (social housing) • Building Regulations (new housing) • Labelling • Mandatory upgrade on sale 	<ul style="list-style-type: none"> • Micro-generation obligation • Integrate LZC into building regulations and into Planning 	<ul style="list-style-type: none"> • Mandatory energy labelling on all new products • Labels on consumption not efficiency • Minimum efficiency standards for a wide range of products

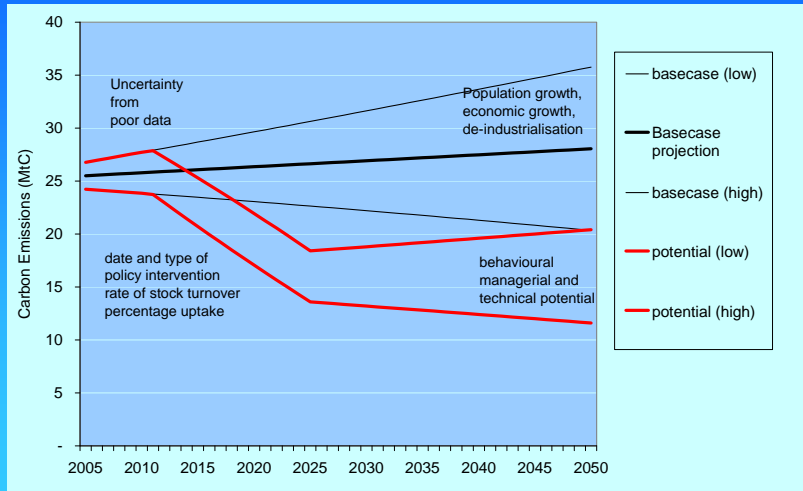


The non domestic sector

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Model philosophy

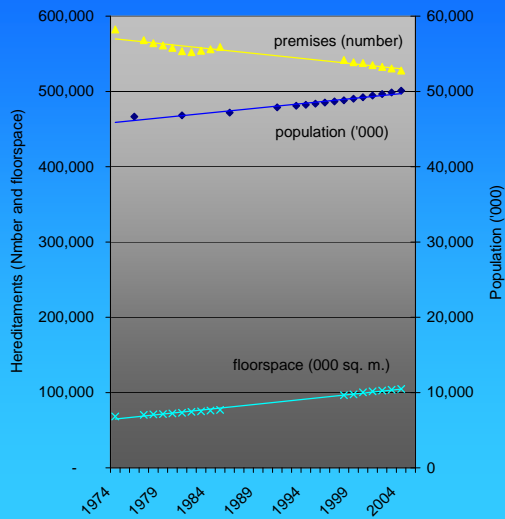


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Trends



Population, number and area of retail (England only)



- More people
- Even more households
- Fewer premises but larger
- 32% more floorspace per person in 2 decades

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Non domestic policy options



- Reduced heat (and cooling loads) through insulation and passive measures, microgeneration, and efficient equipment
- Information, incentives and regulation
 - energy rating of buildings (asset rating, operational rating)
 - Building regulations and planning (speculative development difficult, but stock turnover and refurbishment rapid)
 - Stamp Duty (on purchase and lease)

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