



# **Fuel Poverty and the Green Deal in Hinckley and Bosworth**

**November 2011**

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# Introduction

This report explores the significant opportunity Green Deal offers, through the energy company obligation, for local government to reduce fuel poverty, and explains why inaction will precipitate an increase. Green energy policies are already costing households up to £200 a year (the so-called 'green stealth tax') which will increase as Green Deal takes effect. DECC already assumes that a proportion of the national carbon reduction target will be achieved simply because energy will be too expensive to buy<sup>1</sup>.

As retail energy prices rise, the only way to mitigate the effect is to embrace these same green energy policies. In other words, **"pay to insulate your home, or pay to insulate your neighbour's"**.

## Section 1 – Fuel Poverty

### 1.1 Fuel Poverty – what is it?

In the UK fuel poverty is said to occur when a household needs to spend more than 10% of net income on fuel to heat the home to an adequate standard of warmth. This definition does not take account of the amount that a household *actually* spends on fuel, nor the amount available for the household to spend on fuel after other costs have been met. This definition is essentially that first established by Dr Brenda Boardman in her book, "*Fuel Poverty*", first published in 1988<sup>2</sup>.

"Adequate standard of warmth" is defined as 21°C in the main living room and 18°C in other occupied rooms during daytime hours, with lower temperatures at night, following the recommendations of the World Health Organization. However, there are a variety of different ways of considering household income when measuring fuel poverty.

"Fuel" includes expenditure on domestic energy for heating, hot water, cooking, lights and appliances.

"Income" has not been defined clearly but is assumed to be income net of UK taxes.

### 1.2 How does fuel poverty affect people and society?

**1.2.1** Babies in cold homes will burn calories to maintain body temperature rather than gain weight; weight gain is proportional to brain size and growth. Under-development reduces lifelong prospects and has a potential impact on education, crime, health, social and benefit services.

**1.2.2** A cold home discourages mental effort (e.g. homework; reading). It may well be preferable to spend cold days congregating with friends than be at home in a cold house. Boredom and peer pressure can often lead to anti-social behaviour and contact with the Police and the Criminal Justice System.

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<sup>1</sup> DECC correspondence ref TO2011/10137 dated 11 July 2011.

<sup>2</sup> [http://en.wikipedia.org/wiki/Fuel\\_poverty](http://en.wikipedia.org/wiki/Fuel_poverty)

**1.2.3** A study carried out by Shelter in 2006<sup>3</sup> suggested that children in bad housing conditions are more likely to have mental health problems, such as anxiety and depression; to contract meningitis; have respiratory problems; experience long-term ill health and disability; experience slow physical growth and have delayed cognitive development.

**1.2.4** Cold housing is the main explanation for extra ‘winter deaths’ occurring each year between December and March<sup>4</sup>; in 2008/9 in England & Wales there were 36,700 additional deaths in the December to March period<sup>5</sup>. The ‘*Review of Health and Safety Risk Drivers*’ published by CLG in 2008 found that cold environmental conditions are associated with increased deaths from heart attacks, strokes and respiratory illnesses.

**1.2.5** The three major elements of household expenditure are housing (including rent or mortgage payments), food and energy. When these combined costs exceed income, households face difficult choices, all with outcomes detrimental to the well-being of the family unit.

### 1.3 Fuel poverty levels in Hinckley and Bosworth

There are several data sources and models of fuel poverty applicable to Hinckley and Bosworth.

**1.3.1 DECC Fuel Poverty model** is prepared by the Building Research Establishment and is based on data from the Survey of English Housing. In the calculation of the fuel poverty ratio, the fuel usage is modelled, to ensure the household achieves a satisfactory heating regime. Therefore, if the dwelling is actually heated to a temperature below the level defined as being satisfactory, the estimated bill for that household will be higher than the actual bill and vice versa.

In addition to space heating, the fuel costs component also includes modelled spending on energy for water heating, lights and appliances and cooking.

Determining if a household is in fuel poverty depends on the interaction of a number of factors, but three stand out. These are:

- The energy efficiency of the property (and therefore, the energy required for heat and power)
- The cost of energy
- Household income

**1.3.2 The CSE<sup>6</sup> Fuel Poverty Indicator** is a statistical model of fuel poverty based on the 2003 English House Condition Survey (EHCS) and 2001 Census.

In brief, the EHCS is used to predict the risk of fuel poverty for different household types and the results applied to the 2001 Census to predict the level of fuel poverty for all Lower Super Output Areas (LSOAs) in England. An LSOA is a geographical unit of approximately 700 households.

**1.3.3 The Hi4em Fuel Poverty model** calculates households who actually spend, or risk spending, more than 10% of income on energy, rather than looking at the ability to heat their homes to comfortable levels. This model uses household CO<sub>2</sub> emissions and

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<sup>3</sup> Harker L (2006) *Chance of a lifetime: The impact of housing on children’s lives*. London; Shelter.

<sup>4</sup> Marmot’s Strategic Review of Health Inequalities in England post 2010, “*Fair Society, Healthy Lives*”

<sup>5</sup> Capie R (2009) *Beyond built: The role of housing in tackling inequality*. CIH presentation to the Marmot Review.

<sup>6</sup> Centre for Sustainable Energy

household income data modelled by Experian; DECC Energy Use; Meter data, and Nottingham Energy Partnership fuel prices. The Hi4em model can also be regularly updated to reflect changes in energy prices.

### 1.3.4 Which to use?

The three sources of fuel poverty data demonstrate a wide variance which needs explanation if *all* data sources are to be believed:

Model	DECC	CSE	Hi4em
Nr of households	44,583	41,078	46,472
Nr in fuel poverty	7,655	2,495	6,735
% in fuel poverty	17.17	6.07	14.49

The CSE data is simply old and on that basis alone should be treated with caution.

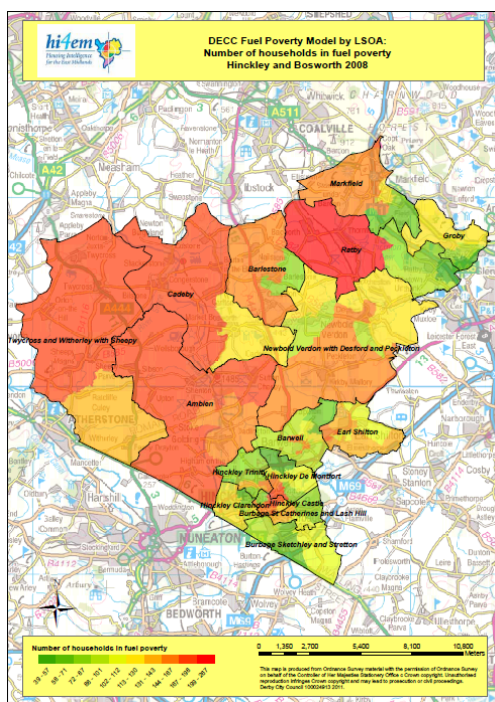
The DECC and Hi4em models differ in the use of data. DECC cost of energy is based on what needs to be spent adequately to heat the home; Hi4em's cost of energy is based on what is actually consumed. So, we can say that whilst 19.2% of households need to spend more than 10 per cent of their household income, only 14.1% actually do so.

The Hi4em model can also be updated on a real-time basis as fuel prices fluctuate, and can also be used to track the effects of insulation and heat-efficiency programmes of work.

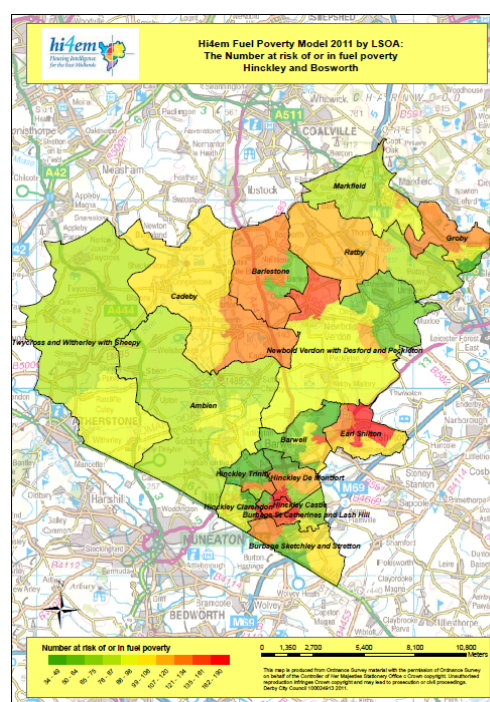
## 1.4 Distribution of fuel poverty

The following maps show the distribution of fuel poverty at lower super output area; highlighting the difference between DECC and Hi4em indicators, where increased concentrations of fuel poverty are expressed as colours from green (low) to red (high):

DECC



Hi4em





## 1.5 What are the characteristics of a fuel poor household?

DECC data and additional data in the Experian dataset used in the Hi4em model can be explored in considerable detail to give a picture of fuel poverty and the characteristics of fuel poor households. Sample tables are listed below; more detail is in Appendix A.

### *DECC data indicates a higher incidence of fuel poverty in:*

DECC data analysis	% in fuel poverty	% of all fuel poor households
Dwellings with SAP less than 20	58.1	11.9
Unemployed household	42.2	7.1
SAP 20 - 30	38.0	9.9
Eligible for Warm Front Grant	37.0	34.2
Single person over 60	33.4	33.8
Benefit dependent household	31.9	60.4
Dwelling age pre-1850	28.4	5.9
Economically inactive household	28.1	67.4
Single person under 60	24.1	20.6
Dwelling age 1850-1899	23.6	14.1
Pre-payment gas	22.6	15.2
Pre-payment electricity	22.5	19.8
Council Tax band A property	22.1	33.6
Standard credit electricity payments	22.0	40.0
Dwelling age 1900-1919	21.8	11.9
Converted to flats	21.0	4.9
People with a long-term illness/disability	20.3	38.7
Rented privately	20.0	18.0
Rural areas	19.8	25.4
Standard credit gas payments	19.8	31.5
Rented from Local Authority	19.6	11.2
End terraced house	18.7	12.5
Lone parent with dependent child(ren)	16.6	7.0

So, for example, 28.4% of those living in pre-1850 dwellings are fuel poor but, because of their relatively low numbers, only 5.9% of those in fuel poverty live in dwellings of that age. Conversely whilst 28.1% of economically inactive households (principally students and pensioners) are fuel poor, 67.4% of all fuel poor households are economically inactive.

### *Experian/Hi4em data indicates a higher incidence of fuel poverty in:*

Hi4em model/Experian data analysis	% in fuel poverty	% of all fuel poor households
Household income under £10k	99.9	64.0
Students and unemployed	63.3	35.1
Elderly single people	42.7	37.9
Living in hamlets or isolated dwellings	35.1	2.1
Property value under £40k	34.9	2.0
Elderly people reliant on state support	33.7	12.6
Single females	33.0	51.5
Young people renting flats in high density social housing	32.3	5.1
Retired household	32.2	41.7
Property value £40k - £60k	30.0	4.4
Property value £61k - £80k	26.0	19.4

Resident under 1 year	25.4	12.3
Households with no mortgage	22.0	91.1
Council Tax band A property	21.1	54.7
Property value £81k - £100k	21.1	22.2
Single males	20.3	24.3
Living in private rented accommodation	19.1	22.6
Resident 11 years or more	15.7	45.4

**Low income households live in cold houses (1):**

Fuel Expenditure as a % of Full Income - All households	% of Whole Stock	Average Full Income	Average Fuel Costs	Average SAP	Average Floor Area (m <sup>2</sup> )
up to 5%	49.9	£39,718	£1,124	55	93
5% to 10 %	34.5	£17,887	£1,203	51	86
10% to 15%	10.0	£11,350	£1,351	45	88
15% to 20%	3.0	£9,131	£1,557	38	97
over 20%	2.6	£5,495	£1,662	37	106

**Low income households live in cold houses (2):**

Full Income Deciles	% Fuel Poor	% of all fuel poor in decile
1st decile (lowest)	77.4	51.0
2nd decile	40.5	26.5
3rd decile	18.1	11.6
4th-10th decile	2.4	10.9

**Average household energy bills by house type and size:**

Nr of bedrooms	Bungalow	Detached	Flat	Semi-detached	Terraced
1	£728	£1,146	£760	£756	£795
2	£978	£1,079	£820	£876	£871
3	£1,106	£1,176	£1,071	£1,019	£947
4	£1,249	£1,327	£1,306	£1,195	£1,072
5+	£1,178	£1,697	£1,293	£1,259	£1,065

**% of fuel poor households in:**

	Bungalow	Detached	Flat	Semi-detached	Terraced	Total
pre-1870	0.35	1.37	1.21	0.69	0.79	4.41
1871-1919	0.30	0.45	1.51	1.61	6.44	10.31
1920-1945	3.42	2.51	1.84	10.92	7.37	26.06
1946-1954	2.00	0.67	0.68	7.50	2.72	13.57
1955-1979	7.74	4.30	3.30	10.53	4.12	29.99
post-1980	2.10	3.19	3.33	4.69	2.36	15.66
<b>Total</b>	<b>15.91</b>	<b>12.48</b>	<b>11.87</b>	<b>35.94</b>	<b>23.80</b>	<b>100.00</b>

## Section 2 – Green Deal

### 2.1 Overview

**2.1.1** The UK is responsible for 2% of the world greenhouse gas<sup>7</sup> emissions and is committed by international agreement and primary legislation (Climate Change Act 2008) to impose strict limits by reducing annual emissions in 5-year ‘carbon budget’ stages (see paragraph 2.2.2) to 20% of 1990 emissions by 2050: from 770 million to 154 million tonnes of CO<sub>2</sub>e (carbon dioxide equivalent<sup>8</sup>) per year.

**2.1.2** The UK’s rapid move towards a low-carbon economy has been heavily criticised as an unacceptable cost (1% of GDP) and a reaction to “alarmist propaganda”<sup>9</sup>, offering the alternative view that climate change may after all prove to be just a natural cyclical phenomenon. However, the cost of *not* moving towards a low-carbon economy may cost between 5-20% of GDP<sup>10</sup>.

**2.1.3** The key ‘non-monetised’ benefits of the new Energy bill are<sup>11</sup>:

- Health benefits for vulnerable groups whose houses improve in terms of their thermal efficiency,
- Air quality benefits associated with reduced energy consumption,
- Security of UK energy supply improved as a result of lower energy consumption.

**2.1.4** As an interim target, between 2008 and 2020, homes in the UK must reduce harmful greenhouse gas emissions by 24 million tonnes of CO<sub>2</sub>e per year, using 2008 (the start of the first carbon budget) as the base year. That figure also *includes* absorbing any increases in energy use caused by our increasing population; our increasing use of electrical goods; and our increasing demand for warm, comfortable homes to live in.

**2.1.5** 20 Million of the 24 million tonnes has been accounted for by DECC<sup>12</sup> across several existing policies explained in more detail in this report; the balance of 4 million tonnes is the main subject of ‘Green Deal’, due to be launched in the autumn of 2012.

**2.1.6** There is no central strategy to devolve the national target to local levels, although the proposed Green Deal strategy strongly recommends that local authorities form partnerships with energy companies to ensure that the delivery reflects the specific needs of the area. This is desirable for two reasons:

- Energy companies will have sizeable obligations to discharge, and will consequently be seeking to enter into partnerships with forward-thinking local authorities in order to avoid the penalty for non-compliance (up to 10% of global turnover).
- To influence the programme of works in favour of early intervention for the needs of lower income and most vulnerable households.

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<sup>7</sup> IPCC (Intergovernmental Panel on Climate Change) lists 22 long-lived greenhouse gases (LLGHG’s).

<sup>8</sup> Carbon dioxide equivalent: reducing all LLGHG’s to the equivalent effect of carbon dioxide as a standard measurement.

<sup>9</sup> “The Really Inconvenient Truth” by Andrew, Lord Turnbull; published by GWPF (Global Warming Policy Foundation).

<sup>10</sup> “Stern Review on the Economics of Climate Change” 2006

<sup>11</sup> Refer to ‘Green Deal Impact Assessment’, 6/12/2020 (sic); page 7

<sup>12</sup> Department for Energy and Climate Change



**2.1.7** Whether or not a household takes advantage of Green Deal to reduce the annual cost of energy, there will still be a charge, on each household's bill, to finance the latest ECO, together with the other 'Green' policies (for example, RHI and FiT).

**2.1.8** At current prices, on average it costs about £200 to buy enough energy to create 1 tonne of CO<sub>2</sub>e. It therefore becomes a mathematical exercise to calculate how many tonnes a household can *afford* to produce without being fuel poor, and from this to identify which measures should be undertaken to reduce emissions to a financially sustainable level.

## 2.2 Background

### 2.2.1 What is 'Green Deal'?

The Energy Security and Green Economy Bill has recently passed through Parliament and should receive Royal Assent later this year. It includes provision for the Green Deal which the Government believes will revolutionise the energy efficiency of UK domestic properties and small business premises.

The Green Deal involves setting up a national bank, the Green Bank, dedicated to the green economy, which is a world's first and which will offer loans of up to £10,000 per property for specific energy efficiency improvements. At the heart of the Government's proposal is the "Golden Rule"; the amount of the loan repayments will not exceed the savings in the cost of energy, for the same level of comfort. The Green Bank will operate from 2012 with £3 billion from the Treasury as initial capital, and borrowing powers from 2015.

In addition to the Golden Rule, the Green Bank introduces an innovative financing mechanism whereby the loan is attached to the property, not the homeowner. The loan is paid back via the energy bill, so if the consumer moves out, and therefore ceases to be the bill-payer at that property, the financial obligation does not move with them but stays with the property; the loan repayments are only made whilst the benefits are enjoyed.

In this way, Green Deal differs from existing lending – it is not a conventional loan, since the property owner isn't liable for the capital cost of the measures, and the occupier is only liable whilst they remain as the bill-payer. This is a market mechanism, funded by private capital, which it is hoped will deliver far more to consumers than a top-down Government programme.

In addition, the new Act will introduce a new Energy Company Obligation (ECO), from 2013, following on from existing ECO's which expire at the end of 2012. This obligation will be in the form of a contribution to the overall cost of the measures, and every bill-payer in the country will have a sum added to their energy bill to pay for it. Details of the new ECO should be released late 2011.

### 2.2.2 Why Now?

In 2008 the Climate Change Act received Royal Assent. This new Act was a direct consequence of the international Kyoto Agreement on Climate Change in 1997, where targets were set for developed countries to reduce greenhouse gas (CO<sub>2</sub>e) emissions by 80% on 1990 levels, by 2050.

The Act sets out three 5-year 'Carbon Budget Period' CO<sub>2</sub>e reduction targets for the UK as a whole, starting from 2008; the Act also allows for further carbon budget period targets to be issued, at appropriate times, up to 2050. The fourth target was recently issued, on 17 May

2011, for the period 2023 – 2027; this proposes a 50% reduction on 1990 annual carbon emissions over the course of the budget period, as compared to 22%, 28% and 34% for the first three.

In 2009, DECC published the Low Carbon Transition Plan which detailed, for five energy sectors, one of which is 'Homes & Communities', what the interim CO<sub>2</sub>e target actually amounted to. For Homes & Communities, the first target is 24 million tonnes, which is a 29% reduction in annual *non-traded* energy use, based on 2008 levels, by 2020.

**Non-traded? The 45% of CO<sub>2</sub>e emissions generated by the supply of electricity for use in the home belongs to the 'traded sector', i.e. are part of the EU-ETS (European Union Emissions Trading System). This system allows electricity generators to trade their allocated permits to generate greenhouse gases. The remaining 55% of CO<sub>2</sub>e emissions does not fall within the EU-ETS and is called the 'non-traded sector'. These emissions come from the burning of fossil fuels (gas, coal, oil etc) at the point of use, i.e. in the home.**

### 2.2.3 Where will the work be done?

This is a cross-tenure scheme; Green Deal will be available to any property owner: social landlord, private landlord or owner-occupier. It is also proposed that, from 2015, tenants will have a right to request the efficiency measures from their landlord, who cannot reasonably refuse such request. 82% of dwellings in England are in the private sector<sup>13</sup>.

The new ECO will include individual targets for tackling fuel poverty in the vulnerable, low-income household sector, and the hard-to-treat property sector. With gas and electricity prices on a continuing upward trend, these sectors need to be tackled soonest, to future-proof fuel poverty reduction targets.

## 2.3 Detail

### 2.3.1 Who will be involved?

The process of delivering individual Green Deal plans will involve only properly accredited and quality assured players:

- **Assessors** will carry out energy audits of properties, issue EPC's (Energy Performance Certificates), recommend qualifying energy saving measures, explore and advise on options for renewable energy and offer advice on other environmental issues such as water conservation.
- **Installers** will carry out the work agreed in the individual Green Deal plan.
- **Providers** will arrange the financial package and co-ordinate the contractual and payment arrangements. Likely Green Deal providers are Energy Providers themselves; financial institutions; high street retailers (for example B&Q; Tesco; M&S) and Local Authorities.
- **Energy Companies** will take repayments from their customers' bills and make payments to Providers.

<sup>13</sup> Office of National Statistics, 2010.

### 2.3.2 National carbon budget 2020 target

The Homes and Communities section of the Low Carbon Transition Plan has set an annual carbon emissions reduction target for the UK of 24 million tonnes of CO<sub>2</sub>e by 2020, based on 2008 levels (i.e. from 84 to 60 million tonnes).

DECC estimates that retrofit energy efficiency measures will be required to up to 7 million homes – 27% of all UK homes - by 2020 in order to meet these targets.

DECC has also, helpfully, split this 24 million tonnes reduction target into several sections:

- 36% ‘business as usual’ amounts to **8.5 million tonnes** (the effects of old policies, together with technological change, boiler replacements, etc. To summarise, reductions in carbon emissions that would happen anyway, without further intervention.
- 10% ‘price impact’ amounts to **2.4 million tonnes**. The estimated retail price of energy is set to rise significantly by 2020 (gas 18%; electricity 33%). Energy *bills*, however, are predicted to rise by, on average, 1% by 2020<sup>14</sup>. This, however, masks the effect of policies across all income deciles. A household in the top income decile that receives no measures is predicted to increase spend by <0.5% of income on energy, whereas the figure for households in the bottom decile is +2%. In contrast, a household that adopts insulation measures is likely to see a 7% drop in energy bills compared to the adoption of no measures. It is difficult to interpret this emissions reduction figure other than as using price as a suppressant of energy use which would, clearly, affect most those households in, or close to, fuel poverty. This quantitative indication of the projected effect of price rises on fuel poverty equates to the **total annual emission** from **446,097** homes<sup>15</sup> (2% of all dwellings).
- 3% ‘zero carbon homes target’ amounts to **0.8 million tonnes**. New homes built in accordance with the proposed Building Regulations Part L (2016) will be required to be zero carbon emitters (in accordance with the definition of zero carbon homes) achieved through a combination of improved passive insulation and the implementation of the renewable heat incentive (RHI). Interim targets apply, of 25% reduction in the 2010 regulations, increasing to 44% in the 2013 regulations, all as compared to the 2006 regulations. Note, however, that the definition of ‘zero carbon’ was relaxed in the 2011 budget, logically making this target less achievable.
- 11% ‘lofts & cavities’ amounts to **2.7 million tonnes** and is to be achieved via CERT which is targeted to complete by December 2012.
- 2% ‘lofts & cavities’ shortfall of **0.5 million tonnes**.
- 6% ‘smart meters’ amounts to **1.5 million tonnes** and refers to the strategy to install smart meters in every home by 2020. The assumption is that, with a smart meter as reference, habits will change so that energy use will become more efficient.

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<sup>14</sup> “Estimated impacts of energy and climate change policies on energy prices and bills” paragraphs 14 & 18, DECC, July 2010.

<sup>15</sup> ONS Table 100: Number of dwellings by tenure and district: England; 2010 – 22,693,000. NI 186 CO<sub>2</sub> emission estimates 2005 – 2008 summary indicator 2008 (England): 122,025 kTCO<sub>2</sub>. Estimated average across all dwelling types 5.38 Tonnes.

- 13% ‘renewable heat incentive’ amounts to **3.2 million tonnes**. This is the central government strategy to encourage the use of low and renewable energy sources for the provision of heating, via financial incentives.
- 4% other ‘CERT & CESP’ targets, due to complete by the end of 2012 and amounting to **0.9 million tonnes**.
- 15% **major measures** shortfall of **3.5 million tonnes**.

**Major measures are ‘eco-upgrades’ defined\* as:**

*Either:*

- A smart meter, loft *and* cavity insulation *plus* small scale renewable energy generation like ASHP, GSHP or Solar Thermal.

*Or*

- A smart meter and solid wall insulation. Small scale renewable energy generation *may* also be included but is not essential.

\*DECC strategy document, “Warm Homes, Greener Homes” Part 1, paragraph 6 (II); p14

Between 4 and 7 million major measures will need to be installed to deliver 7.2 Mt CO<sub>2</sub>e emissions reductions (depending on the type of measures that are installed)<sup>16</sup>.

### 2.3.3 How much CO<sub>2</sub>e can be saved by insulating?

The table below lists typical reduction figures for a range of measures and house types:

Measure	Annual CO <sub>2</sub> e reduction per measure (kg)*				
	Loft Insulation (top-up)	Cavity Wall Insulation	Solid Wall Insulation	Draught-proofing (inc double glazing)	Replace Boiler
Flat, 1 bed	78	183	597	41	476
Flat, 2 bed	113	220	719	56	586
Flat, 3 bed	165	266	868	76	735
Mid terrace, 2 bed	58	233	748	66	617
Mid terrace, 3 bed	73	261	838	79	707
Det bungalow, 2 bed	134	385	1,266	68	935
Det bungalow, 3 bed	156	415	1,366	76	1,031
Det bungalow, 4 bed	180	446	1,467	86	1,133
Semi house, 2 bed	76	445	1,491	83	932
Semi house, 3 bed	87	479	1,603	94	1,023
Semi house, 4 bed	100	513	1,716	105	1,119
Det house, 2 bed	94	724	2,367	96	1,242
Det house, 3 bed	108	779	2,545	107	1,370
Det house, 4 bed	125	837	2,733	120	1,510
<b>Average</b>	<b>80-90</b>	<b>400-450</b>	<b>1,500</b>		

\*Figures (except averages) taken from OFGEM CESP Calculator

<sup>16</sup> ‘Warm Homes, Greener Homes Supporting Papers, Part I, ‘Household emissions: the scale of the challenge’ paragraph 27, page 13

### 2.3.4 How much money can be saved by insulating?

Measure	Annual £ saving per measure (at £200/tonne CO <sub>2</sub> e)				
	Loft Insulation (top-up)	Cavity Wall Insulation	Solid Wall Insulation	Draught-proofing (inc double glazing)	Replace Boiler
Flat, 1 bed	15.60	36.60	119.40	8.20	95.20
Flat, 2 bed	22.60	44.00	143.80	11.20	117.20
Flat, 3 bed	33.00	53.20	173.60	15.20	147.00
Mid terrace, 2 bed	11.60	46.60	149.60	13.20	123.40
Mid terrace, 3 bed	14.60	52.20	167.60	15.80	141.40
Det bungalow, 2 bed	26.80	77.00	253.20	13.60	187.00
Det bungalow, 3 bed	31.20	83.00	273.20	15.20	206.20
Det bungalow, 4 bed	36.00	89.20	293.40	17.20	226.60
Semi house, 2 bed	15.20	89.00	298.20	16.60	186.40
Semi house, 3 bed	17.40	95.80	320.60	18.80	204.60
Semi house, 4 bed	20.00	102.60	343.20	21.00	223.80
Det house, 2 bed	18.80	144.80	473.40	19.20	248.40
Det house, 3 bed	21.60	155.80	509.00	21.40	274.00
Det house, 4 bed	25.00	167.40	546.60	24.00	302.00
<b>Average</b>	<b>£16</b>	<b>£80</b>	<b>£300.00</b>	<b>£17</b>	<b>£175</b>

### 2.3.5 Local carbon budgets

Over the past four years, 30 councils of various political colours, the Federation of Small Businesses, Friends of the Earth, the LGG appointed Climate Change Commission and even Nick Clegg (in opposition) have all called for a system of nationwide legally-binding local carbon budgets, in line with national targets but negotiated and implemented locally. Friends of the Earth argues this would ensure all local authorities are required to take action on climate change/energy security, rather than a relatively small number of committed councils. In its paper to DECC which formed the basis for the Memorandum of Understanding between the two organizations (signed March 2011), the LGG stated that:

*“Action on climate change is not consistent across local government. A new framework is needed to support councils, allow them to be accountable, and increase their level of ambition”.*

The LGG added that it would be open to negotiation on local governments receiving new duties from central government if they were accompanied by new resources. Yet the resulting MoU does not mention local carbon budgets, instead only describing a series of actions to encourage and support local governments to act on a voluntary basis.

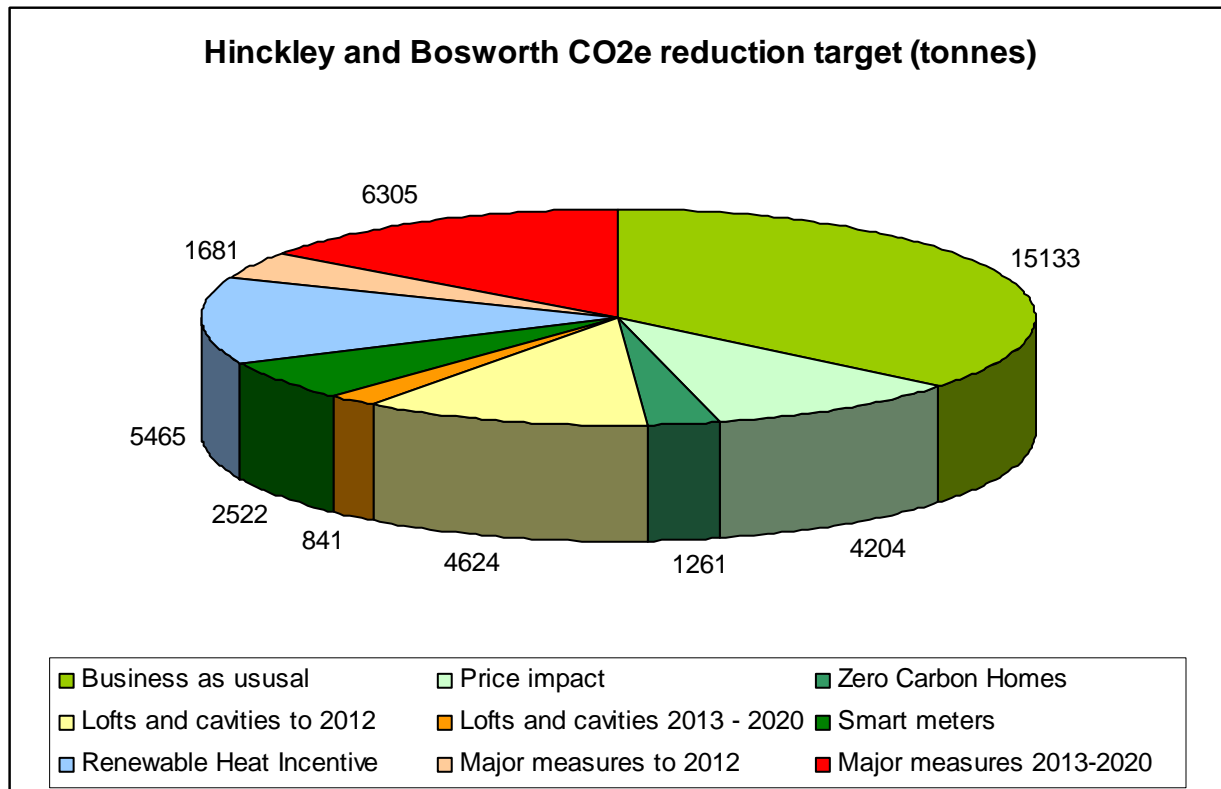
If accompanied by new powers and resources, local carbon budgets could be a powerful tool to enable action across the local government spectrum. A LGiU policy briefing of March 2009 highlighted the new powers and resources local governments would require in order to successfully prepare and execute such local carbon budgets, including the power to incentivise local success and address failure, and access to data from central databases and power companies.

At the moment those powers are not forthcoming. And the government’s Carbon Plan and the MoU between DECC and the LGG suggest a system of nationally-enforced but locally delivered carbon budgets is unlikely in the near future.

## 2.4 What this would mean for Hinckley and Bosworth

### 2.4.1 Minimum target

NI186<sup>17</sup> records that in 2008, domestic CO<sub>2</sub>e emissions in Hinckley and Bosworth averaged 2.4 tonnes per person, or 250,560 tonnes CO<sub>2</sub>e for the Authority, of which 144,949 tonnes were 'non-traded'. Based on the average of 29% reduction, the Hinckley and Bosworth *minimum* domestic emissions reduction target for 2020 would be in the region of 42,035 tonnes. This is apportioned between the various sections as referred to in paragraph 2.3.2:



### 2.4.2 Business as usual, 15,133 tonnes

For example, condensing boilers were first introduced in the 1980's although, as supply costs were higher than for conventional boilers it is unlikely that many were installed in new homes before it became a requirement of Building Regulations in 2005. There are about 43,500 dwellings in the area built with either conventional boilers or with alternative space and water heating systems.

HEED<sup>18</sup> data indicates that 93.7% of homes in the area are heated using gas boilers; there were therefore some 40,786 properties fitted with conventional boilers at the end of 2004. With a life expectancy of approximately 25 years it can be expected that, on average 1,631 will be replaced each year as a matter of course.

On this basis the projection is that 11,417 boilers have already been replaced since condensing boilers became a requirement. Of these 4,893 are likely to have been replaced 2009 – 2011 thus contributing a reduction of approximately 5,000 tonnes CO<sub>2</sub>e towards the 2008 – 2020 targets. In the period 2012 – 2020 a further 14,679 boilers are likely to be replaced with a resultant saving of approximately 15,000 tonnes.

<sup>17</sup> National Indicator 186: Percentage reduction of the per capita CO<sub>2</sub> emissions in the Local Authority area.

<sup>18</sup> Homes Energy Efficiency Database



### 2.4.3 Price impact, 4,204 tonnes

The energy associated with this carbon emission reduction estimate would otherwise have been used, but for the price rendering it unaffordable; those households therefore experiencing a reduction in comfort. This meaning of the target has been confirmed by DECC<sup>19</sup>. Taking the average emission of 5.91 tonnes for dwellings in Hinckley and Bosworth, this 'comfort-reduction' estimate equates to the entire annual emissions from over 700 dwellings.

### 2.4.4 Zero carbon homes, 1,261 tonnes

Taking the average emission of 5.91 tonnes for dwellings in the area, this target equates to the replacement of 213 dwellings with zero carbon homes in the area.

### 2.4.5 Lofts & Cavities, 4,624 tonnes (to 2012)

**2.4.5.1 Lofts.** Around 42,400 dwellings out of the 46,500 in the area were built before 1990, when Building Regulations were revised to require a minimum of 150mm of loft insulation. The Building Research Establishment (BRE) estimates that, nationally, 85% of lofts are capable of being upgraded with 'top-up' insulation; in Hinckley and Bosworth this equates to some 36,000 dwellings.

The Home Energy Efficiency Database (HEED) is the only source of data for *known* loft insulation levels, which reports that of 8,154 dwellings:

- 18.1% have less than 150mm
- 7.1% have between 150mm and 200mm
- 74.7% have more than 200mm.

HEED also records that between January 2009 and October 2010, top-up loft insulation (to a total depth of at least 250mm) was installed in 2,094 homes in the area, resulting in CO<sub>2</sub>e emission reductions of approximately 188 tonnes. Assuming HEED figures are representative:

- 18.1% of dwellings (8,416) would benefit from loft insulation which, at (say) 90kg per installation, would reduce carbon emissions by 757 tonnes.
- 7.1% of dwellings (3,301) would benefit from top-up loft insulation which, at an average of 40kg per installation, is approximately 132 tonnes.

Emissions reduction already achieved: 188 tonnes  
Maximum still to be achieved (757 + 132): 889 tonnes.

**2.4.5.2 Cavities.** Most dwellings built between 1930 and 1983 were built with un-filled cavity walls, but BRE estimates that, for technical reasons, only 75% of cavity walls are capable of being filled. There were around 25,000 dwellings built in the Hinckley and Bosworth during this period, so some 18,750 cavities in the area can be filled.

HEED reports that 6,641 (35%) cavity walls *have* been insulated since January 1992, 1,491 (8%) of these between January 2009 and October 2010 (1,491 x average 450kgs = 670 tonnes).

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<sup>19</sup> DECC correspondence ref TO2011/10137 dated 11 July 2011.

This leaves a potential further emissions reduction of 12,109 (65%) installations x 450kgs = 5,449 tonnes. The full potential towards meeting 2008 – 2020 targets is 6,119 tonnes (5,449 + 670).

Lofts and cavities emissions reductions achieved since 2008	858 tonnes
Maximum potential still to be achieved	6,206 tonnes

The combined *maximum* emissions reduction possible is 7,064 tonnes; deduct the 'shortfall' (see below) to leave a maximum to December 2012 of 6,224 tonnes. The *target* is 74% of the *maximum*.

#### **2.4.6 Lofts & cavities shortfall, 841 tonnes**

To be addressed by Green Deal to complete the remaining 35%; equal to 18,688 loft top-ups or 1,869 cavity insulations. Any additional shortfall not achieved by the end of 2012 will need to be added to these figures.

#### **2.4.7 Smart meters, 2,522 tonnes**

By 2020, every dwelling will have a smart meter fitted, which, it is estimated, will save about 50kgs of emissions per dwelling every year. Also forms part of the 'major measures' target.

#### **2.4.8 Renewable Heat Incentive, 5,465 tonnes**

Tariff payable from 2012 for qualifying systems; also forms part of the 'zero carbon homes' target.

#### **2.4.9 Other CERT & CESP targets due to complete by 2012, 1,681 tonnes**

Whilst CESP and CERT are targeted primarily at loft and wall insulation, the schemes also include measures such as (hot-water) tank insulation and draught proofing. This target addresses savings made by implementing these measures, although at the moment monitoring savings isn't achievable.

#### **2.4.10 Major measures shortfall, 6,305 tonnes**

Almost 9,000 dwellings in the area were built before 1930 and it is likely that virtually all of these were built with solid walls. With SWI achieving an average annual emission reduction of 1.5 tonnes, the target is equal to 4,200 dwellings, or about 47 percent of the total number of available solid-wall properties in the area.

## Section 3 – Using Green Deal to reduce fuel poverty

### 3.1 Setting targets

#### 3.1.1 The minimum target

Section 2 refers to the non-traded CO<sub>2</sub>e reduction target of 4.76% on 2008 emission levels, assuming all targets to the end of 2012 are met. In summary, Green Deal will be expected to deliver a **minimum** 7,146 tonnes CO<sub>2</sub>e emission reductions in Hinckley and Bosworth from:

- Loft and cavity wall insulation – 841 tonnes (item 2.4.6)
  - Target No of lofts – top-up and full insulation 1,129 (12.45% of remaining)
  - Target No of cavity walls 1,705 (12.45% of remaining)
- Solid wall insulation – 6,305 tonnes (item 2.4.10)
  - Target No of solid walls 4,200 (47% of total solid walls)

Alternatively, when looking at the overall target much higher numbers of lofts and cavities would reduce the numbers of solid wall that would need to be insulated to meet targets:

- All possible remaining lofts 9,072 dwellings 598 tonnes CO<sub>2</sub>e
- All possible remaining cavities 13,687 dwellings 6,159 tonnes CO<sub>2</sub>e
- Revised solid wall insulation target 259 dwellings 389 tonnes CO<sub>2</sub>e

#### 3.1.2 Can fuel poverty be eliminated?

There are an estimated 9,000 solid walled dwellings in Hinckley and Bosworth with around 1,200 of these housing fuel poor households. The remaining 5,500 fuel poor households live in dwellings with cavity walls although around 1,100 of these are in dwellings built since 1980 where cavities may already be insulated.

So, to eliminate fuel poverty - at Spring 2011 levels - there needs to be a minimum of:

- 1,200 solid walls insulated
- 4,400 cavity walls insulated
- Other energy saving measures to 1,100 post 1980 homes

Assuming each of these properties requires top-up loft insulation achieving these targets would result in CO<sub>2</sub>e reductions of around 3,000 tonnes or 43% of the reduction target. To eliminate fuel poverty **and** achieve carbon reduction targets would need:

- 3,180 solid walls insulating (35.3%)
- 7,765 cavity walls insulating (56.7%)
- 5,244 lofts insulating (57.8%)

The percentage figures above are the response rates that would be required if all possible properties were targeted. It assumes that all fuel poor households will respond.

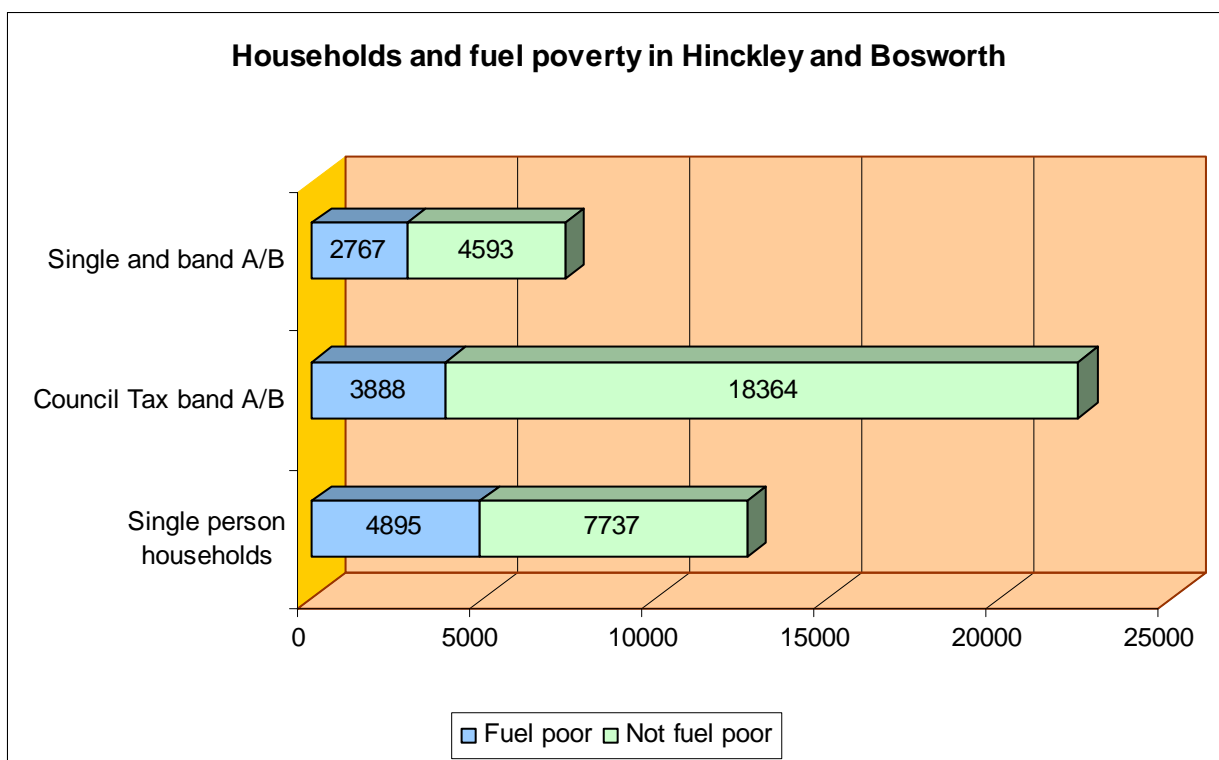
## 3.2 Which households?

### 3.2.1 Single person households

There is clear evidence in both the DECC data and the Hi4em Experian data that around two thirds of all those in fuel poverty are single person households. Both sets of data suggest that around half of those are 'elderly'.

Hi4em data for Hinckley and Bosworth suggests even higher proportions of single person households and elderly or older people in fuel poverty. It is estimated that 4,895 single person households are fuel poor. This is 73% of all fuel poor households and 39% of all single person households. Of these, 4,161 (or 85%) are classified as 'elderly' or 'older'.

Local Authorities already have all the data they need directly to target households benefiting from the Council Tax single person discount. When filtered to those in Band A or B properties an even higher proportion will be fuel poor.



The table below details the age and house type of single person households projected to be in or at risk of fuel poverty. We can then project the measures required and the effects on fuel poverty and CO<sub>2</sub>e emissions:

**Total single person households in or at risk of fuel poverty**

Property Age	Bungalow	Detached	Flat	Semi-detached	Terraced	Total
Pre-1870	18	29	19	10	21	<b>97</b>
1871-1919	21	25	56	54	179	<b>334</b>
1920-1945	269	128	91	390	312	<b>1,191</b>
1946-1954	120	42	35	241	52	<b>491</b>
1955-1979	896	331	139	459	140	<b>1,967</b>
Post-1980	174	188	142	223	89	<b>816</b>
<b>Total</b>	<b>1,498</b>	<b>744</b>	<b>482</b>	<b>1,377</b>	<b>795</b>	<b>4,895</b>

wall type	Bungalow	Detached	Flat	Semi-detached	Terraced	Total
solid walls*	122	93	103	184	297	799
cavity walls	1,202	462	237	970	409	3,280
post-1980	174	188	142	223	89	816
<b>Total</b>	<b>1,498</b>	<b>744</b>	<b>482</b>	<b>1,377</b>	<b>795</b>	<b>4,895</b>

\*Including the 25% of cavity walls estimated by BRE to be impossible to fill.

For example, assume projected take-up is, say, 33% of solid walls, 66% of cavity walls and 90% of lofts, the numbers and CO<sub>2</sub>e emission reductions can also be projected:

#### Nr of dwellings insulated:

wall type	Bungalow	Detached	Flat	Semi-detached	Terraced	total
solid walls/loft ins	40	31	34	61	98	264
- Loft ins only	69	53	59	105	169	455
cavity walls/lofts	794	305	156	640	270	2,165
- Loft ins only	289	111	57	233	98	787
post-1980 lofts	157	170	127	201	80	734
<b>Total</b>	<b>1,348</b>	<b>669</b>	<b>433</b>	<b>1,239</b>	<b>715</b>	<b>4,406</b>

#### CO<sub>2</sub>e emission reductions (tonnes):

wall type	Bungalow	Detached	Flat	Semi-detached	Terraced	total
Pre 1930	70	54	59	106	171	460
1931 - 1980	1,331	512	262	1,074	452	3,631
post-1980	141	153	115	181	72	661
<b>Total</b>	<b>1,542</b>	<b>718</b>	<b>436</b>	<b>1,360</b>	<b>696</b>	<b>4,752</b>

### 3.2.2 Families in Fuel Poverty

Hi4em data estimates that there are 1,839 fuel poor families in Hinckley and Bosworth. Whilst 38.7% of single person households are fuel poor, only 5.4% of families are in fuel poverty. Targeting these households through Council Tax data is not a viable option.

#### Families and home sharers in or at risk of fuel poverty

Property Age	Bungalow	Detached	Flat	Semi-detached	Terraced	Total
Pre-1870	0	36	8	13	9	66
1871-1919	1	18	9	29	88	145
1920-1945	11	101	22	281	155	571
1946-1954	7	10	10	119	25	171
1955-1979	50	155	26	278	67	575
Post-1980	10	137	25	115	26	312
<b>Total</b>	<b>79</b>	<b>457</b>	<b>99</b>	<b>835</b>	<b>369</b>	<b>1,839</b>

Again, assume projected take-up is, say, 33% of solid walls, 66% of cavity walls and 90% of lofts, the numbers and CO<sub>2</sub>e emission reductions can also be projected:

**Nr of dwellings insulated:**

wall type	Bungalow	Detached	Flat	Semi-detached	Terraced	total
solid walls/loft ins	2	28	8	43	48	<b>128</b>
- Loft ins only	3	48	13	74	83	<b>221</b>
cavity walls/lofts	43	155	34	390	131	<b>753</b>
- Loft ins only	15	56	12	142	48	<b>274</b>
post-1980 lofts	9	123	22	103	23	<b>281</b>
<b>Total</b>	<b>71</b>	<b>411</b>	<b>89</b>	<b>751</b>	<b>332</b>	<b>1,655</b>

**CO<sub>2</sub>e emission reductions (tonnes):**

wall type	Bungalow	Detached	Flat	Semi-detached	Terraced	total
Pre 1930	3	49	14	74	83	<b>223</b>
1931 - 1980	71	260	57	654	220	<b>1,262</b>
post-1980	8	111	20	93	21	<b>253</b>
<b>Total</b>	<b>82</b>	<b>420</b>	<b>90</b>	<b>822</b>	<b>324</b>	<b>1,738</b>

### 3.2.3 Shortfall

Combined figures would give:

**Nr of dwellings insulated:**

wall type	Bungalow	Detached	Flat	Semi-detached	Terraced	total
solid walls/loft ins	42	59	42	103	146	<b>391</b>
- Loft ins only	72	101	72	178	252	<b>676</b>
cavity walls/lofts	836	460	190	1,030	401	<b>2,918</b>
- Loft ins only	304	167	69	375	146	<b>1,061</b>
post-1980 lofts	166	293	149	304	103	<b>1,015</b>
<b>Total</b>	<b>1,420</b>	<b>1,081</b>	<b>523</b>	<b>1,991</b>	<b>1,047</b>	<b>6,061</b>

**CO<sub>2</sub>e emission reductions (tonnes):**

wall type	Bungalow	Detached	Flat	Semi-detached	Terraced	total
Pre 1930	73	102	73	180	254	<b>683</b>
1931 - 1980	1,403	772	319	1,728	672	<b>4,894</b>
post-1980	149	264	135	274	93	<b>914</b>
<b>Total</b>	<b>1,624</b>	<b>1,138</b>	<b>526</b>	<b>2,182</b>	<b>1,020</b>	<b>6,490</b>

This give a shortfall of 656 tonnes from the target CO<sub>2</sub>e reduction of 7,146 tonnes. The shortfall is the equivalent of:

- Insulating all possible remaining lofts – 3009
- Insulating an additional 286 cavity walls
- Fitting solid wall insulation to an additional 25 houses



### 3.2.4 Empty Properties and the Private Rented Sector

At 1<sup>st</sup> April 2010 there were 1,323 empty properties in Hinckley and Bosworth with the vast majority remaining empty for a short period between letting or sale. This is an ideal opportunity to undertake renovation and energy efficiency work, particularly in solid walled dwellings; dry-lining of internal walls can easily be installed where bathrooms and kitchens are replaced, without causing major disruption to occupiers.

Through the use of Council Tax data, Local Authority Empty Property Officers could make contact with the owners of newly-empty dwellings to encourage take up of Green Deal at a time that is most convenient for major renovation works. Finance may be available via the Energy Company Obligation, particularly if the dwelling is to be let to or purchased by a low-income household.

If, for example, empty dwellings were representative of the whole housing stock, about 264 would be of solid wall construction. If the owners of 10% of these were persuaded to dry-line the properties each year, this would result in some 211 dwellings receiving solid wall insulation in the period 2013 – 2020: a saving of 316 tonnes CO<sub>2</sub>e. Further incentives could be offered by allocating a part of the estimated £7,000 average revenue from the Empty Homes Bonus towards the cost of the work in return for meeting occupancy conditions.

Through Landlord Forums, accreditation schemes and lettings agencies private sector landlords should be encouraged to plan energy efficiency upgrades at a time that is most convenient for them and any tenants or prospective tenants. The message from central government is that private rented sector energy efficiency standards must be raised, through legislation if necessary with a proposal to ban the letting of residential property with an EPC of F or G.

## 3.3 Who pays?

### 3.3.1 The ECO

Details of the new energy company obligation (ECO) to be announced later this year will apply to energy supply and generating companies. Whilst the scope of the obligation is not yet defined, the draft ECO does at least provide some guidance<sup>20</sup>. It is proposed that the new ECO will be *entirely* focussed on:

- The needs of the lower income and most vulnerable *and*
- Those properties needing the next most cost-effective measures that do not meet the Golden Rule (see paragraph 2.2.1) for example, solid wall insulation which has a payback of 25-30 years.

Like CERT and CESP, it is proposed that the new ECO will include a penalty if the obligation is not met, which equates to 10% of global turnover. Energy companies are actively seeking out those local authorities that can demonstrate a clear commitment to Green Deal; note that the energy companies operate in a highly competitive market for customers and will be aiming to discharge their ECO responsibilities for the least overall cost.

### 3.3.2 The homeowner

All energy users pay for these measures; the government places an 'obligation' on energy companies, who place a (currently hidden) 'green' surcharge on every bill. The obligation does, however, have the effect of redistributing the monies to those in greatest need.

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<sup>20</sup> 'Extra help where it is needed: a new Energy Company Obligation' DECC May 2011

### 3.4 The role of the Local Authority

Households in fuel poverty are trapped in a spiral of the increasing cost of energy, which far outstrips the Retail Price Index (RPI August 2011 = 5.2%) or Consumer Price Index (CPI August 2011 = 4.5%). In the same period, wages have risen by an average of 2.1%, which in real terms translates to a 2.4% drop, or £10 of the average regular pay of £434 per week<sup>21</sup>.

Under these constraints, households in fuel poverty will, in all likelihood, not be seeking to commit to up to £10,000-worth of Green Deal measures. As Green Deal progresses, however, these same households will see their 'green' surcharge increase as more and more of the ECO is committed. The role of the Local Authority is to:

- Create a Green Deal strategy
- Become a Green Deal champion for households in or close to fuel poverty
- Liaise, and form partnerships, with energy companies
- Manage the works to the required standard of quality and service

To ensure that those households in fuel poverty receive early intervention; in effect, to become a 'Green Deal Provider' (see paragraph 2.3.1).

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Hi4em acknowledge the contribution of Nick Peel in the preparation of a similar report at regional level:  
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<sup>21</sup> All data in this paragraph obtained from ONS statistical bulletins.